

Essays on Political Economy, Leader Demographics and Corporate Finance

Evidence from China

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I would like to thank my supervisors, Dr Jian Chen and Dr Jing Chen, for their guidance and care through the path.

This thesis is dedicated to my beloved mum and dad, who always love me and support me with everything they have.

I am also grateful for my dog, Sadaharu, who protects the Earth and is always willing to give me the softest hug.

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Declaration

I declare that this thesis was completed during my PhD study at Nottingham University Business School. This thesis has not been submitted for a degree at any other Universities.

Honghu Chu

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Abstract

Recent trends suggest that political considerations in corporate financial decision-making have become of increasing interest to financial studies researchers. Firms make financial decisions in response to a given institutional setting (North, 1992; La Porta, 1997; and Aghion, 2004) and realise the importance of the trade-off between the delegation of power to leaders and the need to control them to avoid tyranny. China is an emerging market, and with a dramatic development over a short span of 40 years, she has stood firm as the world's number two economic power. With the enormous size of the economy, which provides rich sources of information, and with her unique political-institutional settings, which leads to the coexistence of state-owned sectors and private sectors, our study of political factors of corporate governance, more specifically, the impact of political connections of business leaders on firm financial decision making and performance in the Chinese financial markets provides compelling new evidence which can inform the development of corporate governance theories, since leaders' political connections and demographics have been an important focus and frontier in this area.

This thesis aims to investigate the relationships between political connections and firm performance, political connections and the cost of debt, and leaders' demographics and firm performance. Building on extant literature on these issues, it asks: To what extent does political connection affect firm performance and the cost of debt? To what extent does the leader's demographics affect firm performance? In this context, a leader is considered to be politically connected if he or she is 1) a current or ex-government official at all levels, including current or ex-members of the military department with a rank equivalent to a government official; 2) a

current or ex-member of the National People's Congress (NPC); 3) a current or ex-member of Chinese People's Political Consultative Conference (CPPCC). Leaders' demographics include the leader's gender, age, and education level.

Based on a literature review of these issues, panel data methodology and the fixed effects method were applied for all three essays using a sample of all the Chinese listed firms from 2006 to 2016. We obtain our financial data from the China Stock Market and Accounting Research Database (CSMAR) provided by Guo Tai An Information Service (GTA). This database covers all the listed firms in the Chinese stock markets during the research period. Where political connection variables were not available in the CSMAR dataset, the leaders' demographics, education levels, and career history information were manually collected for the whole sample from the firm's official annual reports and official financial websites, including Bloomberg.com, Yahoo Finance, Finance iFeng, etc.

In the first chapter, we document a significant negative relationship between political connection and firm performance, which indicates that a leader's political connection reduces firm performance. We employ the fixed effects method on the entire sample of Chinese listed firms from 2006 to 2016. Our finding shows that the general political connections and the board chair's political connections are significantly negatively related to firm performance at the highest 1% level (three-star). The CEO's political connection is also significantly negatively related to firm performance with a significance of 5% level (two-star). The findings also suggest that the board chair's political connection is more powerful than the CEO's political connection. We further employ estimations on sub-samples of SOEs and non-SOEs. We document a significant positive relationship between political connections and firm

performance in non-SOEs which indicates that political connection is more beneficial for private listed firms.

In the second chapter, we further conduct estimations on the relationship between political connection and the cost of debt. We document that political connections significantly negatively related to the firm's cost of debt. Panel data methodology and the fixed effects method are employed on the whole sample of Chinese listed firms, excluding firms in the Finance department from 2006 to 2016. The results are robust to different control groups. The research also contributes by separating the board chair and the CEO's political connections and investigating their effects on the firm's cost of debt further. Our finding indicates that CEOs and young leaders are more helpful in reducing the firm's cost of debt.

In the last chapter, we investigate the relationship between leaders' demographics and firm performance using the entire sample of Chinese listed firms from 2006 to 2016. Panel data methodology and the fixed effects method are also employed. We document those female leaders and senior leaders significantly improve firm performance, while an education level of PhD and above also has a significant positive effect on firm performance.

The results indicate that political connections and the leader's demographics do have an impact on firm performance. On this basis, it is recommended that Chinese listed firms use political connections and leaders' demographics as key factors in designing and targeting their campaigns. Further research is needed to identify different political connections and education elements with more sub-sample tests to provide more evidence.

Introduction

A large volume of literature has revealed the role of political connections in listed firms around the world. Many studies show evidence that firm leaders' political connections are linked with poor firm performance (Fan et al., 2007; Li et al., 2008; Ma et al., 2013). Banerji et al. (2018) further indicate that political connections may reduce firm value since the benefit of bailouts brought by the firm's political connections can be cancelled out by the loss of information brought by bank financing. However, political connections are shown to bring benefits from other aspects like lower interest rates (Infante and Piazza, 2014), lower tax rates (Faccio, 2010), more chance to obtain a government bailout (Faccio, 2006), preferential bank loans (Yeh et al., 2013; Khwaja and Mian, 2005; Firth et al., 2009; Sapienza, 2004), easier access to external financing (Claessens et al., 2008; Boubakri et al., 2012a; Boubakri et al., 2012b; Johnson and Mitton, 2003; Hearn, 2012), and potential financial or regulatory treatment from authorities (Faccio et al., 2006; Johnson and Mitton, 2003; Bunkanwanicha and Wiwattanakantang, 2009).

This thesis contains three essays that cover different aspects of corporate governance. However, they share a common scheme which is the role of political connections and personal characteristics in corporate financial decisions and performance as a result. This thesis extends the extant literature's understanding by looking into how political connections and the leader's demographics affect firm performance, corporate governance, and the cost of debt. These topics have been at the frontier of research. However, studies on Chinese cases of these issues have not received wide attention and have not been or unpacked comprehensively, which is our focus.

The Chinese market is a perfect target for our research under these topics. First, China has emerged as the second-largest economy in the world with huge success and dramatic development during the last decades. The Chinese financial markets now are ranked as top global financial markets. Second, China has a relatively clear division of political structure due to its vast geographic diversities area. Central and local governments use their own power to set up plans, allocate resources, and make decisions. It gives listed firms flexibility when they build political connections since they can build political connections on different levels for different purposes. Third, the Chinese economy is a mix of state-owned sectors and private sectors, where state-owned enterprises still dominate key sectors like banking, utilities and private firms operate in a more competitive business. Finally, China has long been considered as a developing country built on '*guanxi*'. Politicians use *guanxi* to build their network to be promoted; businessmen use *guanxi* to establish their business and extend their scales; individuals use *guanxi* to benefit their social lives. Obtaining close relationships with the authorities is beneficial for the listed firms in which political connection is the most direct relationship. Li et al. (2008) even indicate that political connections help the firms to reverse market failure in Chinese stock markets. In this way, building political connections is an effective strategy for Chinese listed firms to develop and beat their competitors. Looking into these issues under Chinese circumstances gives us a better understanding of the extant literature in this area.

We extend the extant studies of the role political connections play using a dataset covering the entire Chinese stock markets with a study period of eleven years—from 2006 to 2016. We follow Ma et al. (2013) and define a leader who is politically connected if he or she is 1) a current or ex-government official at all levels including current or ex-members of the

military department with equivalent government official levels; 2) a current or ex-member of NPC; 3) a current or ex-member of CPPCC. We obtain our financial data from the China Stock Market and Accounting Research Database (CSMAR) provided by Guo Tai An Information Service (GTA), a database covering all the listed firms in Chinese stock markets during the research period. For the political connection variables, demographics of leaders, their education level, and career history information that are not available, the manual collection was conducted from firms' official annual reports and official financial websites including Bloomberg.com, Yahoo Finance, Finance iFeng, etc. for the whole sample.

In Chapter One, we document a significant negative relationship between political connection and firm performance, which adds additional evidence to the research showing political connection reduces firm performance (Fan et al., 2007; Li et al., 2008; Ma et al., 2013). We also document that the power of the board chair in Chinese listed firms is stronger than that of the CEO in general corporate governance. Our findings are robust to the alternative measurement of firm performance in the sub-sample of the state-owned enterprises (SOEs). We document a significant positive relationship between political connections and firm performance in non-SOEs which indicates that political connection is more beneficial for private listed firms.

We then go further in Chapter Two to investigate how a firm leaders' political connections affect the cost of debt. Our empirical results show evidence that political connections significantly reduce the firm's cost debt for the whole sample. The results are robust to different control groups. It also contributes by dividing the board chair and the CEO's political connection and investigating their effects on the firm's cost of debt further. Our findings indicate that CEOs and young leaders are more helpful in reducing the firm's

cost of debt.

In our last chapter, Chapter Three, we investigate the relationship between the leaders' demographics and firm performance. Evidence is found that female leaders and senior leaders significantly improve firm performance. Firm performance is also significantly improved when leaders have a PhD degree and above. This essay extends the current understanding of how leaders' demographics affect firm performance in the context of China. It adds evidence to extant literature that female and senior leaders improve firm performance (Barker III and Mueller, 2002; Yim, 2013; Nguyen et al., 2015). It also gives proof that better-educated leaders bring better firm performance (Ramachandran and Shah, 1999; Jalbert et al., 2002; Carpenter, 2002).

To sum up, our core thesis is that political connections and personal demographics of firm leaders have significant effects on performance and the cost of debt in Chinese listed firms. This thesis supplements extant literature on the general effect of political connections on firm performance and corporate governance; and offers a subdivided understanding of the roles that political connections play as regards various issues. It not only provides information on trading strategies for investors and institutions in the market, but it also indicates the trend of corporate governance, for example, female becoming more welcome in modern Chinese society. The findings provide suggestions for the daily operations and long-term strategies for Chinese listed firms to improve firm performance. The structure of the thesis is organized as follows. Chapter One investigates the relationship between political connection, personal characteristics, and firm performance. Chapter Two investigates how political connection affect a firm's cost of debt. Chapter Three focuses on the relationship between leaders' demographics and firm performance. Concluding remarks are given in the end.

Chapter 1

Political Connections, Personal Characteristics and Firm Performance: Evidence from China

A Thesis Presented for the Degree of Doctor of Philosophy
Nottingham University Business School

1.1 Introduction

A firm is an organization of individuals that can be natural persons or legal persons, or both. Individuals in a firm share a common purpose. They contribute their talents, skills and organize resources to achieve a set of firm goals, for example, to achieve a higher target profit in the short term (Micklethwait and Wooldridge, 2005).

However, profit is not the only way to measure a firm's success. Tobin's Q ratio is another classic way to measure a firm's overall performance. Tobin's Q ratio is defined as the market value of a firm to its replacement cost (Tobin, 1969). If Tobin's Q ratio is between zero and one, the cost to replace a firm's assets is more than the value that the firm is worth. If Tobin's Q ratio is above one, then it means that the firm is worth more than the cost of its assets.

Studying firm performance is particularly important as improving firm performance is one of the firm's ultimate goals. Studying firm performance also provides evidence and advice to investors and institutions to help them build good portfolios. Although firm performance has increasingly been mentioned in the research, extant research shows conflicting results, and scholars still cannot agree with the issues. Some scholars indicate that giving managers firm shares or a long-term incentive plan will improve firm performance (Hölmstrom, 1979; Berle and Means, 1932; and Hölmstrom, 1982). However, Morck et al. (1988) indicate that the firm's market value increases at first with the increase of the managerial ownership, then decreases, and the trend finally leads to a slight increase when the shares owned by board directors increase. Some scholars advise that investors should include firms with older CEOs and female leaders to generate lower but risk-adjusted returns (Serfling, 2014; Low et al., 2015; and Lam et al.,

2013), while others insist that gender and age do not affect firm performance (Dang et al., 2017; Ye et al., 2010).

Variables have been found to affect firm performance in extant literature. Widely accepted variables include firm size, leverage, total assets, growth, the board size, board independence, management shares etc. Scholars believe that leverage (Ibhagui and Olokoyo, 2018), firm size (Bennedsen et al., 2008), the board size, and board independence (Yermack, 1996; Bennedsen et al., 2008) have negative relationships with firm performance; while growth and management shares (Hölmstrom, 1979; Berle and Means, 1932; Hölmstrom, 1982; and Morck et al., 1988) have positive relationships with firm performance.

Apart from the widely accepted variables above, this paper aims to estimate how new variables affect firm performance. The thought of the new variables in this paper comes from a new frontier of the corporate governance field looking into how general political factors affect firm performance. In particular, the political connections of the leadership of a firm play an important role in China's circumstances.

The reason why political connections and the leaders' personal characteristics are likely to affect firm performance has been mentioned in recent literature. Many scholars show evidence that political connections are linked with poor firm performance (Fan et al., 2007; Li et al., 2008; Ma et al., 2013). Banerji et al. (2018) further indicate that political connections may reduce firm value since the benefit of bailouts brought by the firm's political connections can be cancelled out by the loss of information brought by bank financing. However, political connections are shown to bring benefits from other aspects like more chance to obtain a government bailout

(Faccio, 2006) and potential financial or regulatory treatment from authorities (Faccio et al., 2006; Johnson and Mitton, 2003; Bunkanwanicha and Wiwattanakantang, 2009). The mechanism of firm performance affected by the political connection of the leaders is mainly via corporate governance. First, politically connected firms have less motivation to improve efficiency and performance. From the position of the firms, they are less motivated to improve their performance since it is easier for them to obtain benefits or financial support from the government even though they have poor performance, no matter in a financial crisis or under a normal economic situation. From the position of the leaders, they are more willing to maximize their personal benefits within the firm, which leads to a situation like the 'agency cost' issue. Second, firms seeking politically connected leaders are usually either in a monopolistic competition environment or in a fierce competition environment where they need 'political connections' as extra help for their development. The features that make the politically connected leaders attractive are their network and ability to deal with the authorities; because of less professional leaders and less attention to the firm's daily operations, the firm performance grows worse with politically connected leaders.

As to the relation between the leaders' personal characteristics and firm performance, scholars indicate that female and senior leaders improve firm performance (Barker III and Mueller, 2002; Adams and Ferreira, 2009; Yim, 2013; Serfling, 2014; Nguyen et al., 2015). Evidence implies that older and female leaders tend to reduce the firm's risk level through safer investment policies or development strategies; female leaders tend to improve the efficiency of corporate governance and firm performance since they are 1) easier to comply with rules than male leaders; 2) biologically more attentive and showing more patience than males generally, and 3) tend to spend more

time before launching a project or plan to prepare for a better strategy to avoid risks and lower the probability of failure.

Although the relationship between political connection and firm performance is increasingly being mentioned in the research, researchers either employ a partial sample that might not show comprehensive results (Lam et al., 2013; Fan et al., 2007; Li et al., 2008; Chen et al., 2011), or they rarely put the leadership's political connections and their personal characteristics jointly together to estimate the corresponding effect on firm performance especially in Chinese stock markets (Francis et al., 2009; Li and Zhou, 2015). There is still a gap between the comprehensive impact of the leaders' political connections and personal characteristics on firm performance in Chinese markets.

This essay uses the Production Function framework to start with and extends the current understanding of the topic by manually collected political connection variables after developing a definition of political connection.

In this essay, a leader is considered as politically connected if he or she is 1) a current or ex-government official at all levels including current or ex-members of the military department with equivalent government official levels; 2) a current or ex-member of NPC; 3) a current or ex-member of CPPCC. A negative relationship between political connection and firm performance is found. We further conduct a sub-sample test dividing the dataset into SOEs and non-SOEs. Evidence is found that political connection has a negative effect on firm performance among SOEs while it has a positive effect on firm performance among non-SOEs. Hence, this essay fills in the blank concerning the relationship between political connections of leadership, personal characteristics, and firm performance in Chinese listed

firms. The findings in this paper offer a comprehensive view of the effects of the leadership's political connection and personal characteristics in Chinese listed firms. Evidence is also found that the board chair has more influence than the CEO under Chinese circumstances giving they are both engaged in the firm's operations. These findings may also offer trading strategies for investors and policy implications for authorities.

Thus, this paper investigates the relationship between political connections of leadership, personal characteristics, and firm performance among all the Chinese listed firms. Leadership refers to the board chair and the Chief Executive Officer (CEO) of the firm, while political connections refer to whether the board chair or the CEO is current or ex-politician. This paper also estimates the effect of the leadership's personal characteristics on firm performance. Personal characteristics of the leadership include their gender and age. Other controlling variables include leverage, firm size, growth, board independence, and management shares. The study period is eleven years, from 2006 to 2016.

The related data concerning political connections of the leadership is manually collected since it is not entirely available in any database. Part of the personal characteristics data, for example, the education background of the leaders, is also missing in the current database since some of the information is not mandatory to be disclosed in official annual reports as required by the China Securities Regulatory Commission (CSRC). Thus, this part of the data is also manually collected. The main data source of those data is from the firm's official annual reports and official financial websites, including Bloomberg.com, Yahoo Finance, Finance iFeng, etc.

The structure of this paper is organized as follows. The following section, Part Two, is the literature review. Then Part Three covers hypotheses, data description and methodology. The main part is Part Four which explains the data process and results. The final part is Part Five, which is the conclusion. Here, the summaries, suggestions and limitations will be given.

1.2 Literature Review

A key concept of the firm is how it forms and functions to convert its physical and nonphysical inputs to outputs. According to the production function, however, a firm's output is not a mathematical function of inputs since any sets of inputs can be converted into outputs via the production process. The inputs not only include physical items like the equipment but also include labour, capital, and management, which are harder to measure compared with the physical inputs.

The achievement of outputs of such a production process could be reflected directly with the profits, which in most cases, is also the main target of a firm. Accounting ratio analysis is a method that employs variables such as earnings before interest and tax (PBIT), net income and comprehensive income to measure firm performance. The other main approach to measure firm performance is Tobin's Q ratio mentioned earlier in the introduction.

The main debate of which variable is the best out of all the choices of accounting ratio analysis depends on which variable is more highly associated with stock returns (Skinner, 1999). Skinner (1999) compared representative studies by Dhaliwal et al. (1999) and Vincent (1999) to explore whether stock returns are more highly associated with net income or alternative measurements. The comparison study included variables such as net income, comprehensive income, funds from operations (FFO), cash from operations and PBIT. However, only weak evidence was found that net income has a stronger association with stock returns, but no such evidence was found in any other measurements.

As to the other main approach to measure firm performance, the advantage of using Tobin's Q ratio is that it can avoid problems of estimating either rate of return or marginal costs. However, the disadvantage of employing Tobin's Q is that it is difficult to measure both the market value and the replacement cost of a firm accurately to get a meaningful Tobin's Q ratio.

Among the inputs of the firm, management plays a significant role in contributing to the firm's outputs. This is because management is at the top of the decision-making progress, and it is responsible for the allocation of resources available to the firm.

1.2.1 Extant Theories of Firm Performance and Its Influencing Factors

Hölmstrom (1979) indicated that firm members offer two kinds of services: first, they supply inputs for production; second, they process information for decision-making. This feature causes incentive problems within the firm where the managers and shareholders have different incentives. Berle and Means (1932) put across this argument earlier, pointing out that managers in the firm tend to make use of the resources available to generate benefits for themselves instead of the shareholders if the managers do not own shares of the firm. This is because managers do not have the same interests as the shareholders under this circumstance. This kind of principal-agent problem will make the shareholders suffer from the agency cost that is equal to the deviation from the shareholder's interest by the agent.

The reason why firm managers (or agents) are important is that they are the daily operators of the firm even though they have different interests from that of the shareholders. The decisions they make and their efficiency have a direct impact on the firm's activities and hence performance. Hölmstrom (1982) further studied the moral hazard of managers. He defined moral hazard as the problem of inducing managers to supply proper amounts of inputs when their behaviours cannot be observed and contracted directly. Ideally, the shareholders want to directly ensure that the managers are always acting for the shareholders' best interests. But the shareholders and the managers have asymmetric information making this target hard to achieve. Hölmstrom (1982) then focused on two features: free riding and competition within the managers. He implied a new essential role for the firm owners via the free-rider problem: to administer the managers' incentive schemes that are not balanced. He also showed that competition among managers has an advantage solely as a tool to extract information optimally.

While the firm owners may well try to contract the managers correctly to maximize the firm's output, if we focus on the key managers in the firms: the CEOs, who are the most senior corporate officers or administrators to maximize the value of the firms, we will find that nowadays their compensation is a portfolio instead of simply salaries.

There are mainly two approaches to induce CEOs (or managers) to act for the shareholders' best interests more closely: the first one is to give the CEO firm shares; the second one is to give the CEO an annual or long-term incentive plan in other forms.

Jensen and Meckling (1976) once investigated a sample that contains firms owned purely by the managers. They found that the agency cost, which is the 'deviation' mentioned above, is zero. Thus, they imply that increasing the shareholdings of the managers is the solution to the problem. However, Fama and Jensen (1983) challenged this theory as they found that the relationship between the managerial shareholdings and firm performance was an inverted U-shaped. The benefits brought by managerial shareholdings stop when managerial shareholdings get to a certain level.

Similarly, Morck et al. (1988) ran an empirical analysis of the relationship between management ownership and firm performance. They employed Tobin's Q ratio to measure the firm's overall performance, which, according to them, is the market valuation of a firm. They used data from three hundred and seventy-one Fortune five hundred firms in 1980 and found that there was a significant non-monotonic relationship between the two variables of interest. Their evidence shows that the market value of the firm (Tobin's Q) increases at first, corresponding with the increase of managerial ownership.

However, the firm's market value then decreases, and the trend finally leads to a slight increase when the shares owned by board directors increase. When they narrow down the observations to older firms, they find evidence that the market value of the firms is lower when the leadership falls in the hands of the founder family. In contrast, the firm performs better when someone irrelevant to the founder's family leads the firm.

When it comes to the second approach, on the other hand, Bushman et al. (1996) found that the CEOs of large U.S. firms typically have a base salary together with an incentive component. The incentive component for the CEO can be an annual bonus plan and a long-term incentive plan which depends

on the evaluation of performance. Further, they found evidence that the individual performance evaluation of CEOs, instead of accounting and stock-price-based measures, increases with the growth opportunities relative to assets in place, length of product development and product life cycles.

Both of those two approaches above aim to maximize the firm's overall performance by minimizing the difference in the interests between managers and shareholders.

Beyond the factors brought by the nature of a firm, there are many other factors that are widely accepted as they have been proven to influence a firm's performance. Among these, board size is one of the topics for discussion. Yermack (1996) indicated that small boards could help the firm to achieve better performance since small boards have higher efficiency than large boards. He employed Tobin's Q ratio to measure the firm's market value as an indicator of firm performance. The study period was from 1984 to 1991, and the research sample was four hundred and fifty-two larger industrial corporations in the United States. The evidence showed a negative relationship between board size and firm performance. He also conducted some robustness tests on this result. The tests proved the robustness of the results with many other control variables such as firm size, internal ownership of shares, growth, and different corporate governance structures.

In addition, Yermack (1996) implied that small boards help the firm to generate better financial ratios by advantageous values. Meanwhile, small boards are also beneficial in providing better performance incentives for the chief executive officer and reduce the chance of a dismissal.

Following the research on larger listed firms, Bennedsen et al. (2008)

conducted a further study on the small and medium-sized firms and the relationship between board size and firm performance. They considered the existing less confident evidence of small and medium firms as the result of weak identification schemes and unfinished analysis of the causal relation compared with those significant robust negative results from larger firms. Thus, they employed a data sample of nearly seven thousand 'closely held firms' and innovated to identify a new instrument which was the number of children of the CEO in a firm. In the paper, they define a firm board as a large board when it has six or more members; otherwise, it is a small board. The research showed two main results: first, if the firm board had members who were relatives of the CEO, then there was a significant positive relationship between the board size and the size of the CEO's family; second, a 'small' negative relationship between board size and firm performance was found among the firms that have relatively larger boards.

1.2.2 Political Connections, Personal Characteristics and Firm Performance

Along with the development of production function theories and corporate governance theories, more attention has been put on looking at the relationship between leadership characteristics and firm performance.

The leadership of a firm normally refers to the board chair and the CEO of the firm. The leadership's characteristics include their gender, age, education level, career history, and many other aspects, even the CEO's death (Falato et al., 2014). It is suggested that each of the characteristics affects firm performance via different channels.

Kaplan et al. (2012) used a distinct dataset to find out the general relationship between CEO characteristics and firm performance among the firms that are engaged in buyouts and venture capital transactions. They implied that CEO characteristics mainly vary along with two directions: one is general abilities, and the other is the combination of communication, interpersonal and executive abilities. Their results suggested that general abilities and executive skills have a positive impact on firm performance. However, general abilities and many other executive skills are deeply affected by or associated with the manager's age, gender, former work experience, and education.

Serfling once focused on managers' age and firm performance. Serfling (2014) narrowed his research to the relationship between CEO age and a firm's dicey behaviour. One of his results was aligned with the prior research prediction that the dicey behaviour of a firm is reduced when the CEO becomes older. He also found evidence of a negative relationship between CEO age and the fluctuation of stock return. His research suggested that older CEOs lower the firm's risk through safer investment policies. Firms with older CEOs tend to invest less money in research and development (R&D); they are under diversified in their operations, and the firms were usually found to have more diversification acquisitions and lower operating leverage.

In addition, he found evidence that the lowest values of the risk of policies were found in firms where both the CEO and the next leader are older than those of other firms. Those firms with the highest values were those with younger CEOs and next leader. However, the results also implied that CEO and firm risk preferences are in line. In the end, he suggested a trading strategy involving holding more firms managed by young CEOs and less

firm managed by old CEOs in one portfolio to generate lower but risk-adjusted returns. His entire research implies that CEO age has a significant effect on a firm's dicey behaviour and firm performance.

Even if age's effect on decision making is easy to intuit by common sense, the effect of gender on firm performance needs empirical evidence case by case. A recent study by Low et al. (2015) implied that female directors on the board have a positive impact on firm performance. They focused on a sample of firms from Asia (Hong Kong, South Korea, Malaysia, and Singapore) and employed return on equity (ROE) to measure firm performance. The results showed a positive relationship between the increase of female directors and firm performance. But this relationship is more likely to be found in countries where females have more power and are participating more economically. They also suggested that gender allocation of appointments was driven by tokenism, and female directors could reduce firm performance in countries with heavy cultural resistance.

Work experience or career history is another factor that affects firm performance. Custódio and Metzger (2014) put their attention on the CEOs who have work experience and background in finance. According to their research, several aspects of the financial background of CEOs influence firm policies and performance. First, firms that hired these CEOs tended to have more debt instead of cash, and they were more likely to undertake share repurchase. Second, firms with these CEOs were more likely to use complex financial policies. For instance, these firms tended to use a different discount rate based on their projects instead of a single firm-wide discount rate. CEOs in these firms were more willing to manage financial policy, and firm investments were less sensitive to cash flow. Finally, CEOs with a professional background in finance could get funds from external resources

even under the circumstance that the credit condition of the firm was under pressure. Their research showed that professional financial CEOs responded more to dividend and capital gains tax cuts in 2003. Regarding the matching between financial professional CEOs and firms that hire them, they find that the firms with this preference are more likely to be mature firms.

Not only does a leader's work experience matter, the evidence suggests that the length of expected tenure also has an impact on a firm's market valuation. Antia et al. (2010) demonstrated that top managers' horizon is an influencing factor of firm performance. They defined a top manager's decision horizon as measured by the expected length of tenure. Their empirical results showed that a short decision horizon (or expected tenure) brings more agency costs, high information risk and lower market valuation of the firm, which stands for poorer performance. This empirical study aligns with the notion that the expected tenure of top managers is symptomatic of their investment preferences and seeking short-term pay-back at the cost of long-term firm value and performance.

However, empirical results do not always show matching evidence. Nelson (2005) tries to estimate the relationship between CEO characteristics, corporate governance changes and firm performance. He looked at a panel dataset of 1721 firms and a study period of fifteen years from 1980 to 1995. This was to reveal facts and further details about how corporate governance changes developed over time. During that period, most of the firms carried out amendments of charters, 'poison pills' or other corporate governance articles that were potentially damaging to shareholders' interest. Especially among the poor-performing firms, boards were shown to be more likely to commence corporate governance changes to bypass approval from shareholders. Among better-performing firms, shareholders are more likely

to agree on improving the power of the boards. However, further estimation failed to prove any relationships between the CEO's age, working tenure, compensation, and changes to firms' governance policy.

Moving away from the regular framework of corporate governance issues, political connections of the firm have gained more and more attention since they are believed to affect firm performance through many channels.

Faccio et al. (2006) focused on the probability for a firm to get government bailouts to reverse its financial performance. They focused on a sample of 450 firms with political connections over 35 countries in the world. The study period was five years, from 1997 to 2002. According to their research, firms with political connections had a significantly higher probability of accessing government bailouts. Especially, firms with political connections were very much more likely to be saved when international institutions like the International Monetary Fund (IMF) and the World Bank offered funds or financial support to the firm's home country or government. But they further found that firms with political connections demonstrated poorer financial performance compared with the other firms who also received government bailouts. This phenomenon not only existed in the firms during the bail-out but also later on, following the bail-out. They concluded that the political connections of a firm affect firms' financial performance by influencing the capital allocation of the government's financial support and assistance when the firm is facing financial distress.

Bliss and Gul (2012) further estimated the relationship between political connections and the cost of debt. Their sample of firms with political connections came from Malaysia. Their research showed evidence that lenders considered firms with political connections in Malaysia as being

high in risk. Previous research had only found firms with political connections in Malaysia to be considered as high-risk by the market and audit firms. They also identified several facts: firms with political connections in Malaysia tend to have remarkably higher leverage; they are more likely to report losses; these firms are also more likely to have negative values of equity, and the firms' possibility of being audited by a leading audit firm is also significantly higher than firms without political connections.

As a result, politically connected firms might face higher interest rates from the lenders since lenders tend to follow efficient contracting strategies while these firms show a heavier inherent risk of their own. In addition, lenders consider the appearance of CEO duality to bring more risks in those firms with political connections. But Bliss and Gul (2012) suggested that a high number of independent directors on the audit committee could reduce those risks perceived by the lenders. Thus, political connections in Malaysian firms increased the cost of debt, hence the distress costs associated with their financial performance.

However, He et al. (2014) found evidence that CEOs' political connection significantly increased firm value among Chinese listed firms. They employed a sample of Chinese listed firms from 2000 to 2010 and focused on the effect of CEO turnover on firm value. Their findings were that when CEO turnover brings increased political connection, then a positive cumulative abnormal stock return was observed, indicating that the firm's value increased after the CEO turnover. The effect of CEO turnover with increased political connection was significant on the increase of firm value. They further investigated the effect on different groups. They found that investors' reaction to political connection is stronger among poorly performing firms and firms with a new external CEO. The reaction was

weaker among high tech listed firms and firms located in a developed area in China. As to the groups of SOEs and non-SOEs, they indicated that political connection is less important in increasing firm value among SOEs while is of more value in increasing firm value among non-SOEs.

From the above discussion, we can make the observation that different, even opposite effects may be brought by a firm's political connection in respect of the performance, depending on its influence on the access to funds and support facing financial distresses. For example, Banerji et al. (2018) further pointed out that political connections may reduce firm value since the benefit of bailouts brought by the firm's political connections can be cancelled out by the loss of information brought by bank financing.

1.2.3 Literature on Chinese Case Studies

As an increasing market whose impact is growing every day, China's stock market has been a popular and meaningful research object. Studies on Chinese listed firms are springing in every aspect.

Lam et al. (2013) focused on the effect brought by CEO gender and executive compensation on firm performance among Chinese listed firms. They collected a sample of one thousand firms in China's stock market during the period from 2000 to 2008. According to their dataset, 4.4% of the CEOs in the sample were females. Their results showed that the female CEO's impact and contributions are growing, especially in privately controlled firms. But unfortunately, their results only provided limited empirical evidence of the effect brought by CEO gender on firm performance.

Giannetti et al. (2015) studied the impact of directors with a foreign education background or experience on firm performance in China. Their findings showed that firm performance increases after the firm hires directors with a foreign education background or experience and identified the channels through which the emigration of talent leads to a brain gain. Their findings provide evidence that directors with a foreign education background and experience transmit their knowledge about management practices and corporate governance to firms.

Since the new frontier of political connections theories has appeared, scholars are adding new variables with differing characteristics to current models of firm performance theories and production function. Top managers and the leadership's direct political connections are attracting more and more attention.

In China, firms tend to keep good relationships or political connections with the government to have more access to funds, opportunities, and support to operate and develop. Having a board chair or CEO with political connections will enhance the firm's performance from the word 'go'. Normally people would think political connections of the board chair or CEO brings benefits to the firms via the leaders' knowledge and corporate policies on certain issues. They could also pass their experience to the firm's internal governance to extend the benefits and effectiveness brought by their political connections.

However, as political connection studies add more factors into the corporate governance field and production function models, more findings and empirical evidence show that top managers' political connection negatively

affects firm performance. For example, Fan et al. (2007) tried to estimate the relationship between the CEO's political connections, corporate governance, and firm performance after the firm's Initial Public Offerings (IPO). Using a sample of 790 firms that are currently partially privatized in China's stock market, they showed that 27% of the CEOs in those firms were ex-politicians or even present politicians. But their results showed that CEOs' political experience (or political connection) had a negative effect on firm performance measured by the firms' stock returns. This effect was found to begin even from the very first day of the firm's IPO.

A later study by Li et al. (2008) also found similar results concerning the negative effect brought by political connection on firm performance. But the empirical evidence was only found in state-owned firms under the government's control.

Francis et al. (2009) focused in particular on the effect of political connections on a firm's IPO process by evaluating how political connections affect the pricing, the dimension of under-pricing and the fixed cost when they go public. The study focused on the process of the newly listed firms going public on Chinese stock markets and applied multiple measurements of each firm's political connection. The results showed strong evidence that such politically connected firms grab significant favourable benefits when they go public. These firms tended to have a higher IPO price, a lower chance of being under-priced and lower fixed costs regardless of their ownership structure.

More recently, Li and Zhou (2015) further supported the study of Francis et al. (2009). Li and Zhou (2015) worked with a dataset of IPOs of private firms using manually collected data. They estimated the regulatory level benefits

brought by political connections to firms since it is a fact that the IPO process in China is controlled by the government. They state that this topic is rarely mentioned in current literature. Their findings can be summarized along three lines: first, political connections play a significant positive role in enlarging the chances for the firm's IPO applications to be approved by China Securities Regulatory Commission (CSRC); second, in addition, politically connected firms have significantly more chance of receiving favourable treatments from the CSRC which could be higher IPO prices; finally, the chances for those politically connected firms to be selected for pre-IPO on-site auditing are also very much higher than other non-connected firms. They documented that these findings are answers to the question of why China has hidden away from introducing a disclosure-based regulatory regime, and the findings also partially explain the persistent poor performance of Chinese stock markets.

Aside from the relationship between political connection, firm IPO and firm performance, Chen et al. (2011) turned their attention to the impact of political connections on the rent-seeking behaviour of Chinese private firms. They start with the rent-seeking incentives of Chinese local governments that stimulate listed private firms to build political connections. Then they further analysed the effect of such connections on firm controlling structures. Their results showed that firms in regions where the local government had more power and desired to allocate resources tended to build political connections more often. In this case, the local economy in those regions was less likely to be market-oriented. This finding aligns with the concept that local governments' incentives to engage in rent-seeking stimulate firms to find protection and guarantees from political connections. They further imply that the controlling owners of such firms prefer to concentrate their power and dominate the directors on the board. To do so, the controlling

owners often occupy the position of board chair or CEO. In this way, controlling owners maintain a concentrated structure in their firms and retain the benefits grabbed through rent-seeking and the political connections they built.

Similarly, in part to the topic of this paper, Ma et al. (2013) studied the relationship between political connection, founder-managers positions and tunnelling of Chinese listed firms. Highlighting their research, firstly, they applied a sample of Chinese listed firms from 2004 to 2010. To classify the different level of political connections, they developed three dimensions of political connection with two types of ownership structure: State-owned Enterprises (SOEs) and private firms; then, they found different empirical evidence based on the classifications above.

Overall, they found empirical evidence that political connections of firm managers negatively affect the firm's tunnelling among private firms, while those political connections had a positive effect on tunnelling among SOEs. They also defined the founder-manager as the person who is the founder of the firm and is also currently the manager of the firm. The results showed that firms with founder-mangers were less likely to be engaged in tunnelling. The inducement of tunnelling for managers depends on their motive to build related political connections.

At the beginning of their research, Ma et al. (2013) referred to the definition of tunnelling from Djankov et al. (2008) as the motivation of large shareholders or managers to gain private benefits. They consider political connections as the ultimate power behind the firm's tunnelling, and they suggest that political connection is a hand that affects firm performance in different ways.

Thus, they classified two types of political connections: first, the official type of political connections, which is the case where the managers of the firm are current or ex-government officials or military officials; second, the CPC/CPPCC type of political connections which occur where firm managers are current or ex-members of National People's Congress (CPC as they translate the appellation as 'Chinese People's Congress') and National Committee of the Chinese People's Political Consultative Conference (CPPCC). They further assigned two levels to these connections, which are the central level and the local level, based on whether the manager's political position belongs to the central government or local government. They tried to fill the gap of how different motivations of politically and non-politically connected managers affect the firm's tunnelling behaviour in both private firms and SOEs, considering the case of whether the firms have founder-managers.

Section three of their research firstly stated the main hypothesis: for SOEs, the political connections have a positive relationship with tunnelling, while for private firms, political connections have a negative relationship with tunnelling. For all the firms in the sample, they predicted that the official type of political connections would have a positive relationship with tunnelling regardless of the ownership of the firm. However, they predicted that the CPC/CPPCC type of political connections would have a negative relationship with tunnelling. Then they further predicted firms with founder-mangers are less likely to be engaged in tunnelling and that political connections of the firm's board chair have more influence on the firm's tunnelling.

Their sample consisted of all A-share listed firms on both Shanghai and Shenzhen Stock exchanges from 2004 to 2010. However, they deleted four types of firms among the A-share sample: financial firms, firms whose ultimate owner was not a domestic entity, firms that were also listed abroad, and firms that were in the first year of offering. Their financial data came from the CSMAR database, while the political connections data and managers' profiles were collected manually from Google, Baidu and Wikipedia.

Their main original contribution was to collect data on the firm's political connections by identifying whether a top manager was current or ex-politician. They demonstrated that this definition included four types of people under China's specific political conditions: in China, people were considered politically connected if they were current or former 1) central or local government officials; 2) military officials; 3) members of National People's Congress; 4) members of National Committee of the Chinese People's Political Consultative Conference. They classified a firm as having official type political connections if the firm had top managers from the first two groups, and they classified a firm as having CPC/CPPCC type political connections if the firm had top managers from the last two groups.

They defined their dependent variable 'tunnelling' as the ratio of total other receivables to total assets. They employed dummy variables to measure the main variables. For instance, they measured a firm's political connections by the dummy variable that equalled to one if either the board chair or the CEO were politically connected; zero otherwise. They also tried to measure the general level of political connections. For example, they set a dummy variable that equalled one if the firm had central level political connections; zero otherwise. In addition, they added a founder variable that equalled one

if the founder of the firm was still the manager; zero otherwise. The statistics showed that 36.5% of the private firms and 35.23% of the SOEs were politically connected in their sample.

Apart from all the key political connections variables, they employed some control variables that included wedge, management shares, firm size, return on assets, leverage, sales growth, board independence and duality, which equalled one if the board chair and the CEO was the same person and zero otherwise.

During the empirical process, they purely applied the Ordinary Least Squares (OLS) regressions of tunnelling on the top managers' political connections. The results were generally in line with their hypothesis. Overall, the evidence showed that political connections were significantly negatively related to tunnelling in private firms, while political connections were significantly positively related to tunnelling in SOEs.

The main results based on their classifications showed the evidence in detail. The evidence showed that the managers with the official type of political connection had a positive effect on the firm's tunnelling, but this kind of significant effect could only be found in SOEs. The managers with the CPC/CPPCC type of political connection had a negative effect on the firm's tunnelling, but this kind of effect was more significant in private firms. When they ignored the different types of political connections and tried to estimate the general effect based on the levels of the political connections, they implied that the central level of political connections was more likely to be associated with tunnelling behaviour. They concluded that managers with the central level of political connections have a higher incentive to the tunnel than those who have local political connections. In addition, the findings

showed that the board chair's political connections had a more significant effect on tunnelling than the CEO's. This evidence supports the concept that the board chair, instead of the CEO, is the top manager of the firm among Chinese listed firms, which has implications for future studies to cover in this area. A robustness test using three instrumental variables confirmed their main results above.

1.2.4 Conclusion

To sum up, very briefly, we have examined the development of firm performance, the production function, personal characteristics, and political connections. The effects of some widely accepted factors have been confirmed in most of the cases, while under certain circumstances, the same variable may show opposite effects in different economies, regions or during different time periods.

However, we also find that there is still a gap concerning the relationship between the political connection of the leadership, personal characteristics, and firm performance in Chinese listed firms. Some studies have tried to estimate similar relationships, but they either employ a sample with many missing data, which might not show comprehensive results, or they rarely put the leadership's political connections and their personal characteristics jointly together to estimate the corresponding effect on the firm performance. Importantly, we argue, they do not separate the political connections of the board chair and the CEO on firm performance. Thus, this paper will generate hypotheses based on the literature review above and aim to make original contributions.

1.3 Hypotheses, Data and Methodology

1.3.1 Background and Hypotheses

1.3.1.1 Background of Chinese Political Environment for Listed Firms

As we all know, China is a country under the dictatorship of the Communist Party of China (CPC). As a communist country, it is stated that the entire power and right to make policies and decisions belong to its people, who nominally participate in the decision-making process via the National People's Congress (NPC). Thus, China is a country whose main authority body is NPC, while the National Committee of the Chinese People's Political Consultative Conference (CPPCC) plays an assistant and advisory role in policy and decision making. As selected by the people, the government is nominally to execute those policies and decisions and manage the country's daily issues. Thus, politicians in China are composed of three types of people: 1) government officials at all levels and members of the military department with equivalent government official levels; 2) members of NPC; 3) members of CPPCC.

However, the fact is that the government holds the ultimate power to make any decision while those two authority bodies only exist in name and vote for the proposals that have been decided already. Thus, the central and local government officials or politicians have direct power and influence on policies, decisions and authorize permissions. That could be any specific issue, including the permission of financial support for a listed firm or the approval of a firm's IPO or any operation project. Even if ex-politicians no

longer have such a direct impact, they still have their background and strong network in some specific areas. This is one of the reasons that listed firms are eager to build political connections either via relationships with the government at all levels or by hiring ex-politicians.

Evidence has been widely found that political connections help firms access government bailouts hence improve financial performance (Faccio et al., 2006), receive favourable treatments from the authorities (Li and Zhou, 2015), and raise a higher IPO price (Francis et al., 2009). Conflicting empirical evidence also shows that political connections negatively affect firm performance (Fan et al., 2007) and raise the risk of the firm's rent-seeking and tunnelling behaviour (Chen et al., 2011; Ma et al., 2013).

If we look at the issue from the other motivational positions, apart from the firms that initiatively seek political connections (mainly private firms), we will find that most of the SOEs have such political connections at the behest of the government. Most of the current listed SOEs appeared after the Share Issue Privatization reform in the 1990s. This reform is led by the Chinese government trying to cut out part of the business of SOEs and make it listed publicly.

However, the parent firms, institutions or government organizations still own the absolute majority of the shares in listed SOEs. Ma et al. (2013) showed that the largest shareholder of this kind of medium SOE retains 40.87% of the shares. They are the ultimate controller of listed SOEs behind a veil. They would arrange current or ex-politicians to occupy the leadership via hiring or administrative appointment to make sure the listed SOEs are under their control and operated for their benefit. That is why we can observe current or ex-politicians being appointed as the board chair or CEO or concurrent

CEO/chair of listed SOEs by related institutions or government organizations.

There are mainly three kinds of circumstances in which current or ex-politicians become a listed firm's board chair or CEO or concurrent CEO/chair:

First, the current or ex-politicians may be appointed directly by related institutions or government organizations. They may be current politicians who serve concurrently as the leader in the firm; they may be ex-politicians who are appointed to switch their political position to a firm's leader; they may also be ex-politicians who are appointed after other work experience since their political turnover. An example is found in 600158 China Sports Group Industry Co., Ltd.

China Sports Group Industry Co., Ltd is a listed firm on Shanghai Stock Exchange. It belongs to the General Administration of Sport of China, and its main business is to develop the Chinese sports industry and sports-themed real estate. Mr Liu Jun was the board chair and CEO during the period between 2010 and 2014 in our data; he is heavily politically connected, showing as the profile table below:

Table 1- 1 Main Career Path of Liu Jun, Board Chair and CEO of SH600158

Mr Liu Jun	***Male, 52, MBA of Fudan University***
Main Career Path	Joined *National Sports Commission* (now *General Administration of Sport*) in 1985. Secretary to Yuan Weimin during Mr Yuan's tenure as the director of *General Administration of Sport*. Former Investigator of *General Administration of Sport* and the director of *Foreign Liaison Division*.

Mr Liu Jun	***Male, 52, MBA of Fudan University***
Main Career Path	In April 2010, Mr Liu was appointed as the president of China Sports Group Industry Co., Ltd. He concurrently served as the deputy director of *Sports Equipment Centre, General Administration of Sport*. In September 2010, Mr Liu was appointed as the chair of China Sports Group Industry Co., Ltd after the ex-chair Xie Yalong was arrested. Concurrently served as board chair and CEO afterwards.

As to the other two circumstances through which current or ex-politicians become a listed firm's board chair or CEO, they are mostly from the person's personal objectives and are more likely to be found in private firms:

Second, the current or ex-politicians may be switching to the business that they once engaged in due to their official political service; or they may be choosing to join the business as they have been persuaded or motivated by their personal network/relationships built during their political service.

Third, the ex-politicians may simply quit the political job and choose to start their own venture or find a new job as the board chair/CEO for better fortune; otherwise, the ex-politicians may have quit for a long time and experienced different other works before they turn to be the board chair/CEO of a listed firm. In that case, the political connection effect brought by the ex-politicians is more likely to be limited.

When politicians choose to quit their political position and join a private firm, either of their own wills or motivated by other factors, there is a fact that should be considered under Chinese circumstances. China considers itself a functioning market economy with Chinese characteristics. But private firms are at a disadvantage in many fields since the government at all levels are

actually the 'hands' that allocate key resources in society.

The resources include not only physical resources such as land use permission, energy allocation, and preferential electricity prices; but also includes non-physical resources such as easy access to bank loans, financial support from authorities, and the opportunity to win government-related projects. For instance, we could easily observe that listed SOEs get access to preferential financial support even with poor performance (Cull and Xu, 2005). Thus, Chinese private listed firms are eager to build political connections to obtain the benefits and even claim fair rights in the unbalanced market.

1.3.1.2 Hypotheses

Based on the literature review and the discussion above, this paper aims to investigate the relationship between political connections of leadership, personal characteristics, and firm performance among all Chinese listed firms. The main hypotheses are as follows.

First, many scholars show evidence that political connections are linked with poor firm performance (Fan et al., 2007; Li et al., 2008; Ma et al., 2013). Banerji et al. (2018) further indicate that political connections may reduce firm value since the benefit of bailouts brought by the firm's political connections can be cancelled out by the loss of information brought by bank financing. The mechanism of firm performance affected by the political connection of the leaders is mainly via corporate governance. First, politically connected firms have less motivation to improve efficiency and

performance. Second, the features that make the politically connected leaders attractive are their network and ability to deal with the authorities; because of less professional leaders and less attention to the firm's daily operations, the firm performance grows worse with politically connected leaders. Lastly, politically connected leaders may have negative operation mode and working habits built in their political careers, which have a negative effect on their subordinates as well as the firm's efficiency.

Hence, between the general political connections and firm performance, we expect:

H1. For all listed firms, general political connections are negatively related to firm performance.

A fact in China is that the board chair and the CEO have differences in position and the role played in Chinese listed firms. Normally a CEO is a chief administrator among a few corporate executives in charge of managing the firm, while the board chair is an executive elected by the board of the firm with all the board members to present the decisions or outcome of their meetings.

As we earlier mentioned in the literature review, Fan et al. (2007) defined the CEO as the determining executive; however, Chen et al. (2006) and Kato and Long (2006) defined the board chair as the determining executive since the board chair is also engaged in daily operations widely among Chinese listed firms as we know that the board chair is the legal representative of the firm according to China's Corporate Law. Kato and Long (2006) further suggested that the board chair is more powerful than the CEO, even if they are both engaged in the firm's daily operations. They give an example to

explain the phenomenon: in China, it is deemed as a promotion if someone is assigned as the board chair in the listed SOEs, but it is deemed as a demotion if someone is assigned as the CEO from the position of the board chair.

Thus, it is necessary to investigate the political connections of the board chair and the CEO separately to figure out whether they affect firm performance differently:

H2. For all listed firms, the board chair's political connection is negatively related to firm performance.

H3. For all listed firms, the CEO's political connection is negatively related to firm performance.

We expect that overall, the political connection will be negatively related to firm performance, and the effect brought by the board chair's political connection is more powerful than that of the CEO's political connection.

As to the relation between leaders' personal characteristics and firm performance, scholars indicate that female and senior leaders improve firm performance (Barker III and Mueller, 2002; Adams and Ferreira, 2009; Yim, 2013; Serfling, 2014; Nguyen et al., 2015). Especially, Lam et al. (2013), Nguyen et al. (2015), and Adams and Ferreira (2009) point out that compared with male leaders, female leaders improve firm performance in different ways. First, women and men have different behaviour patterns in their daily life and different biological habits when making choices. Biologically, men tend to be more aggressive, while women tend to be more risk-averse. In this way, male leaders are more likely to choose risky projects

and make aggressive investments, leading to more potential failure that harm firm performance. Second, it is usually a fact that men spend less time when making choices which makes them thoughtless and fail to consider under a comprehensive view to avoid losses. Third, it is harder for male leaders to comply with rules, leading to poorer efficiency, hence poorer firm performance. Literature has shown that the attendance of female top managers for meetings is significantly higher than male top managers (Adams and Ferreira, 2009).

Hence, for the relationship between the leader's gender and firm performance, we expect:

H4. For all listed firms, having male leaders reduces firm performance.

When it comes to how the leader's age affects firm performance, Barker III and Mueller (2002), Yim (2013), Serfling (2014), and Xie (2015) etc. suggest that senior leaders improve firm performance in several ways. Generally, young and senior leaders have different attitudes and preferences towards firm strategies. Senior leaders bring better firm performance and less risk. First, senior leaders have gain experience and knowledge through their careers. They tend to build strategies that allow lower risks to avoid potential loss. Second, senior leaders tend to avoid more risk in the firm's daily operations, which brings more fluctuations and potential poor performance of the firm. Lastly, senior leaders prefer to remain stable in their career path since this is beneficial for them to keep their current personal and firm interests as well as better firm performance.

Hence, for the relationship between the leader's age and firm performance, we expect:

H5. For all listed firms, age is positively related to firm performance.

Overall, for the leader's characteristics and firm performance, we expect that male leaders have a negative effect on firm performance; thus, female leaders can help the firm to perform better. As to the leader's age, we expect that a firm's performance is better with an older board chair and CEO on average.

1.3.2 Data and Sample

1.3.2.1 Sample Description and Variable Definitions

The sample for this paper simply consists of all the listed firms on the Chinese stock exchanges (Shanghai and Shenzhen). The study period is eleven years, from 2006 to 2016. We have 3,222 listed firms making up 25,572 observations in total during the study period. But the dataset is unbalanced since some listed firms are listed after 2006 or delisted during the period, so data is not available.

Table 1- 2 Number of Observations

Year	Number of Firms	Number of Politically Connected Firms	Proportion
2016	2728	1072	39.30%
2015	2842	1160	40.82%
2014	2652	1119	42.19%
2013	2536	1085	42.78%
2012	2492	1120	44.94%
2011	2363	1069	45.24%
2010	2129	985	46.27%
2009	1774	845	47.63%
2008	1625	783	48.18%
2007	1571	762	48.50%
2006	1456	680	46.70%
Total	24168	10680	44.19%

The table above shows the descriptive statistics of the sample and the main variable (political connection). From the table, we observe that there are 10,680 politically connected observations out of 24,168 observations. The proportion shows the percentage of politically connected firms out of the sample by year. For instance, in 2014, we have 2,652 firms, including 1,119 politically connected firms. The proportion is then calculated as 1,119/2,652=42.19%. Even the proportion is slightly decreasing; we still got a relatively high value of 39.30% by 2016. Overall, it is 44.19% among the datasets.

This essay employs Tobin's Q ratio to be the measurement of the dependent variable firm performance. The independent variables include two groups: the main group contains variables of the leadership's political connections and personal characteristics (gender and age); and the controlling group contains variables that are widely accepted as the influencing factors of firm

performance such as leverage, firm size, growth, board independence, and management shares.

There are mainly two ways to measure firm performance: one of the measurements that are widely used is Tobin's Q ratio. Tobin's Q ratio is defined as the market value of a firm divided by the total assets of the firm (Tobin, 1969). If Tobin's Q ratio is between zero and one, it costs more to replace a firm's assets than the firm is worth. If Tobin's Q is above one, then it means that the firm is worth more than the cost of its assets. The advantage of using Tobin's Q ratio to measure firm performance is that it can avoid the problems of estimating either rate of return or marginal costs. However, the disadvantage of employing Tobin's Q is that it is difficult to measure both the market value and the replacement cost of a firm accurately.

The other way to measure firm performance is by applying accounting ratio analysis. Accounting ratio analysis is a method that employs variables such as earnings before interest and tax (PBIT), net income and comprehensive income to measure firm performance. The main debate of which variable is the best out of all the choices of accounting ratio analysis depends on which variable is more highly associated with stock returns (Skinner, 1999). Skinner (1999) compares representative studies by Dhaliwal et al. (1999) and Vincent (1999) to find out whether stock returns are more highly associated with net income or alternative measurements. The comparison study includes variables such as net income, comprehensive income, funds from operations (FFO), cash from operations and PBIT. However, only weak evidence is found that net income has a stronger association with stock returns, but no such evidence is found in any other measurements.

Thus, we follow Morck et al. (1988) and Yermack (1996) to employ Tobin's Q ratio to measure firm performance. Since the leaders' personal characteristics, including gender and age, are also treated as important influencing factors of firm performance, we follow Serfling (2014), Low et al. (2015), and Lam et al. (2013) to employ the board chair and the CEO's gender and age as the main independent variables.

We define a board chair or CEO as politically connected if either he or she is a current or ex-government official at all levels or a current or ex-member of National People's Congress (NPC), or a current or ex-member of the Chinese People's Political Consultative Conference (CPPCC), or a current or ex-member of the military department with equivalent government official levels.

Each variable is defined in detail in the table below.

Table 1- 3 Definitions of Variables

	Variable Name	Definition/Measurement
Dependent Variable	Firm Performance (FP)	Tobin's Q ratio, which equals the market value of a firm to its replacement cost.
Main Variables	Political Connection (PC)	Dummy variable that equals one if either, or both, the board chair or the CEO of the firm is politically connected; and zero otherwise.
	Board Chair's Political Connection (BPC)	Dummy variable that equals one if the board chair is politically connected; and zero otherwise.
	Board Chair's Gender (BG)	Dummy variable that equals one if the board chair is male; and zero otherwise.
	Board Chair's Age (BA)	The board chair's age.
	CEO's Political Connection (CPC)	Dummy variable that equals to one if the CEO of the firm is politically connected; and zero otherwise.

	Variable Name	Definition/Measurement
	CEO's Gender (CG)	Dummy variable that equals one if the CEO is male; and zero otherwise.
	CEO's Age (CA)	The CEO's age.
Control Variables	Leverage (LE)	Measured by the ratio of total liabilities to total assets of the firm.
	Growth (GRO)	Measured and calculated as (observation year's total assets - previous year's total assets)/ previous year's total assets.
	Firm Size (SIZE)	Natural logarithm of the total assets of the firm.
	Board Independence (INDE)	The number of independent directors on the board.
	Management Shares (MS)	Natural logarithm of the shares owned by the management.

Further to prepare the data for the empirical process, we use the STATA software to calculate descriptive statistics and the correlation coefficient check of the variables to observe the statistical features of the data and make sure there is no significant relationship in-between.

Table 1- 4 Variable Descriptive Statistics

Variables	Observations	Mean	Std. Dev.	Min	Max
Tobin's Q	24,982	2.274562	2.279674	0.032362	13.29931
Board Chair's Age	23,883	51.14672	7.149802	21	84
CEO's Age	23,813	47.63125	6.499787	21	79
Leverage	24,165	0.467446	0.241932	0.046542	1.368867
Growth	22,237	0.154092	0.290292	-0.4723	1.688231
Firm Size	25,511	21.86288	1.419908	18.78401	26.79644
Board Independence	24,017	3.258942	0.687177	0	8
Management Shares	17,092	14.23075	3.883933	0	21.93036

The table above shows that we have at least 17,092 observations for each variable. This sample contains all the Chinese listed firms. The table also shows statistical features of the variables, including the mean, standard deviations, minimum and maximum value of the variables. For instance, we observe that the board chair's age varies between 21 and 84, which means the youngest board chair in this sample is 21 years old, while the oldest is 84 years old. The leverage variable ranges from 0.0465 to 1.3689, with a mean of 0.4674. Further, regarding the board independence variable, we observe that the minimum number of independent directors on the board is 0, while the maximum number of independent directors on the board is 8.

For the variables with dummy values, the table below provided an overview.

Table 1- 5 Statistics of the Board Chair's Political Connection and the CEO's Political Connection

Year	Number of Firms	Number of Politically Connected Board Chair	Proportion	Number of Politically Connected CEO	Proportion
2016	2728	969	35.52%	541	19.83%
2015	2842	1036	36.45%	585	20.58%
2014	2652	1000	37.71%	551	20.78%
2013	2536	971	38.29%	527	20.78%
2012	2492	998	40.05%	542	21.75%
2011	2363	954	40.37%	523	22.13%
2010	2129	880	41.33%	467	21.94%
2009	1774	753	42.45%	386	21.76%
2008	1625	684	42.09%	351	21.60%
2007	1571	660	42.01%	355	22.60%
2006	1456	585	40.18%	325	22.32%
Total	24168	9490	39.27%	5153	21.32%

From the table above, we can observe that 39.27% of firms have or once had a politically connected board chair, and 21.32% of the firms have or once had politically connected CEOs. The percentage of the politically connected board chair is overall larger than the politically connected CEO. This also shows a tradition in China that the board chair normally has more power than the CEO. The highest percentage for politically connected board chair is 42.45%, while the highest percentage for politically connected CEO is 22.60%. The lowest percentage for politically connected board chair is 35.52%, while the lowest percentage for politically connected CEO is 19.83%.

Table 1- 6 Statistics of the Board Chair's Gender and the CEO's Gender

Year	Number of Male Board Chair	Percentage	Number of Male CEO	Percentage
2006	1281	96.03%	1348	96.01%
2007	1451	95.84%	1464	95.44%
2008	1523	95.97%	1515	95.04%
2009	1681	96.06%	1659	94.75%
2010	2025	95.65%	1971	93.90%
2011	2254	95.55%	2190	93.59%
2012	2376	95.35%	2323	93.82%
2013	2415	95.30%	2360	93.87%
2014	2527	95.47%	2474	94.28%
2015	2703	95.34%	2648	94.37%
2016	2596	95.51%	2534	94.52%
Total	22832	95.58%	22486	94.39%

From the table above, we observe that the majority of the firm leaders are male. On average, the percentage of male board chair is 95.58%, and the percentage of male CEO is 94.39%. Based on all the information above, we have a comprehensive view of the variables and data. The correlation coefficient check result shows there is no significant relationship in-between. The result is attached in the Appendix.

1.3.2.2 Data Description

Based on the definitions and measurements of the variables above, our data mainly come from two data sources. The data reported by the financial statements of the listed firms were obtained through the China Stock Market and Accounting Research Database (CSMAR). That includes the total assets of the firm, total liabilities, and net income, etc. Data that are currently not entirely available anywhere were manually collected data from the firm's official annual report and official financial websites, including Bloomberg.com, Yahoo Finance and Finance iFeng, etc. This included the political connection information concerning the leadership and part of their personal characteristics. These are missing in the current database since some of the information is not mandatory to publish according to the specifications of the China Securities Regulatory Commission.

Since the annual report of the firms rarely publishes the entire career history of the leadership, when we manually collected these data, we searched through official financial websites for an additional information source. We looked through the firm's annual report in the first place, but if we had to find additional information, we resorted to third-party websites deemed trustworthy and including Bloomberg.com, Yahoo Finance and Finance iFeng, etc. In this case, we note leaders as politically connected if one of these websites published such information (for example, an ex-mayor of a city) and no other sources implied otherwise.

1.3.3 Methodology and Models

From the literature review in part two, scholars have used different methodologies when investigating related topics depending on the data and sample features they used. There are mainly three kinds of methodologies we consider when making attempts: cross-sectional methodology, time-series methodology and panel data methodology.

The cross-sectional methodology is applied to estimate the sample at a selected specific time. For example, we could build a sample of listed firms in an observation year and estimate the characteristics of these firms. Thus, the cross-sectional methodology is often described as a descriptive methodology.

During the empirical process, it mainly applies cross-sectional regression to estimate the causal relationship between variables. The main difference between cross-sectional methodology and time-series methodology is that time-series methodology is similar to an aggregate of cross-sectional analysis through time.

The advantage of using a cross-sectional methodology is that it does not require many data resources when it deals with causal relationships. It allows analysing variables without controlling the environment. However, the disadvantage is that it does not offer much explanation of the results apart from the causal relationship. In addition, it suits better in studies that have a short study period (less than five years) and relatively simple relationships.

By contrast, time-series methodology suits better for a longer study period offering linear relationships. They were given a large sample with enough

data it allows to analyse both the characteristics and the patterns of the sample and offer a sound forecast. Thus time-series models allow us to expect the trend of the results based on the linear relationship, for example, when we deal with the growth problems.

Accordingly, the disadvantage of the time-series methodology is that it requires a longer study period and a larger sample. Moreover, it puts time effects on the primary place over other factors. This means that it is easily affected by the environment; more deviations appear along with a longer study period. Thus, the trend it gives may not happen.

Panel data methodology partially combined the features of cross-sectional methodology and time-series methodology. It describes the sample's multiple characteristics from different aspects over more than one single period. Thus, it offers more accurate results and prediction. Panel data methodology could deal with different research areas, including behaviour analysis and dynamic analysis. It could reduce the errors to a minimum level. Thus, panel data methodology generates better results than those obtained by adding up separate cross-sectional analyses. However, the disadvantage of panel data methodology is that it has to follow specific assumptions and empirical processes. Moreover, it requires a strong exogenous of variables.

Thus, this paper employs panel data methodology and builds three models below to obtain comprehensive results for hypotheses **H1** to **H5**:

$$FP_{it} = \beta_1 + \beta_2 PC_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [1]$$

In equation [1] above, FP_{it} is the firm performance measured by Tobin's Q ratio. PC_{it} LE_{it} GRO_{it} $SIZE_{it}$ $INDE_{it}$, and MS_{it}, are the matrixes of the factors influencing firm performance. They stand for political connections, leverage, growth, firm size, board independence, and management shares, respectively. Besides, β_1 is the intercept and ε_{it} is the disturbance term. μ_i is for the time-invariant effects that make an individual different from the others.

$$FP_{it} = \beta_1 + \beta_2 BPC_{it} + \beta_3 BG_{it} + \beta_4 BA_{it} + \beta_5 LE_{it} + \beta_6 GRO_{it} + \beta_7 SIZE_{it} + \beta_8 INDE_{it} + \beta_9 MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [2]$$

In equation [2], FP_{it} is also the firm performance measured by Tobin's Q ratio. BPC_{it} BG_{it} BA_{it} LE_{it} GRO_{it} $SIZE_{it}$ $INDE_{it}$, and MS_{it}, are the matrixes of the factors influencing firm performance. They stand for the board chair's political connections, the board chair's gender, the board chair's age, leverage, growth, firm size, board independence, and management shares, respectively. Besides, β_1 is the intercept and ε_{it} is the disturbance term. μ_i is for the time-invariant effects that make an individual different from the others.

$$FP_{it} = \beta_1 + \beta_2 CPC_{it} + \beta_3 CG_{it} + \beta_4 CA_{it} + \beta_5 LE_{it} + \beta_6 GRO_{it} + \beta_7 SIZE_{it} + \beta_8 INDE_{it} + \beta_9 MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [3]$$

In equation [3], similarly, FP_{it} is also the firm performance measured by Tobin's Q ratio. CPC_{it} CG_{it} CA_{it} LE_{it} GRO_{it} $SIZE_{it}$ $INDE_{it}$, and MS_{it}, are the matrixes of the factors influencing firm performance. They stand for the CEO's political connections, the CEO's gender, the CEO's age, l leverage, growth, firm size, board independence, and management shares, respectively. Besides, β_1 is the intercept and ε_{it} is the disturbance term. μ_i is for the time-invariant effects that make an individual different from the others.

1.4 Empirical Results

1.4.1 Data Process

This paper uses the STATA software to estimate the empirical models. The first step involves setting up the sample as a panel using the command *xtset firm year*. The results show the sample as an unbalanced panel from 2006 to 2016 since some of the firms are not trading in this period.

To limit the effect of spurious outliers, we applied the 'winsorizing' process. We first tried to observe the outliers using codes *summarize*, *scatter*, and *graph box* in STATA. We observed that some outliers exist beyond the cut points range between 1% and 99%. For example, for the variable Tobin's Q, the value of the 1st percentile cut point is 0.032, and the 99th percentile cut point value is 13.299. We then applied code *winsor2* and winsorized the variables at the 1st and 99th percentile. To examine whether the dataset had further unobserved outliers, we re-ran the winsorizing at the 2.5 and 97.5 percentile and found that the results did not have marked changes.

We then run the Ordinary Least Squares (OLS) regression and the Estimation of the Random Effects on each model; the results are showing as follows:

Table 1- 7 OLS Regression Results

VARIABLES	Equation [1] Tobin's q	Equation [2] Tobin's q	Equation [3] Tobin's q
Political Connections	-0.188***		
	(0.0302)		
Board Chair's Political Connection		-0.148***	
		(0.0310)	
Board Chair's Gender		0.0891	
		(0.0714)	
Board Chair's Age		0.000239	
		(0.00215)	
CEO's Political Connection			-0.173***
			(0.0367)
CEO's Gender			-0.0165
			(0.0648)
CEO's Age			0.00715***
			(0.00238)
Leverage	-1.378***	-1.402***	-1.374***
	(0.0767)	(0.0775)	(0.0776)
Growth	0.690***	0.697***	0.719***
	(0.0565)	(0.0567)	(0.0569)
Size	-0.709***	-0.707***	-0.718***
	(0.0134)	(0.0137)	(0.0136)
Board Independence	0.0667***	0.0654***	0.0550**
	(0.0243)	(0.0243)	(0.0245)
Management Shares	0.0494***	0.0495***	0.0504***
	(0.00416)	(0.00417)	(0.00421)
Constant	17.60***	17.44***	17.43***
	(0.274)	(0.288)	(0.290)
Observations	14,815	14,732	14,634
R-squared	0.293	0.293	0.293

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

To find the most suitable estimation method, we then apply the Estimation of the Random Effects on the sample to compare the results:

Table 1- 8 Random Effects Estimation Results

	Equation [1]	Equation [2]	Equation [3]
VARIABLES	Tobin's q	Tobin's q	Tobin's q
Political Connections	-0.222***		
	(0.0408)		
Board Chair's Political Connection		-0.207***	
		(0.0425)	
Board Chair's Gender		-0.0829	
		(0.0901)	
Board Chair's Age		0.0106***	
		(0.00266)	
CEO's Political Connection			-0.155***
			(0.0466)
CEO's Gender			-0.0535
			(0.0766)
CEO's Age			0.0122***
			(0.00271)
Leverage	-0.971***	-0.981***	-0.966***
	(0.0968)	(0.0976)	(0.0978)
Growth	0.456***	0.476***	0.479***
	(0.0489)	(0.0491)	(0.0493)
Size	-0.741***	-0.751***	-0.756***
	(0.0184)	(0.0188)	(0.0189)
Board Independence	-0.0871***	-0.0877***	-0.100***
	(0.0303)	(0.0304)	(0.0306)
Management Shares	0.0729***	0.0726***	0.0731***
	(0.00624)	(0.00626)	(0.00627)
Constant	18.46***	18.21***	18.22***
	(0.391)	(0.404)	(0.402)
Observations	14,815	14,732	14,634
Number of id	2,511	2,506	2,505

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

From the two tables above, we observe that OLS and the estimation of the random effects offer different results. For the political connection variables, both OLS and the estimation of the random effects show a significant negative effect. The overall political connection effect is significant at the highest level in both estimations. The board chair's political connection is significant at the highest level in OLS, and it is also significant at the 1% level in the estimation of the random effects. The CEO's political connection's effect is significant at the highest level in both estimations.

The board chair's gender and age have different directions and significance in each estimation. In OLS estimation, the board chair's gender and age have a positive impact on firm performance, though neither of them showing a significant effect. In the estimation of the random effects, the board chair's gender has a negative effect on firm performance, and age has a positive impact on firm performance at the highest level. For the CEO's personal characteristics, gender shows a negative effect on firm performance in both estimations with no significance, while age indicates a significant positive effect on firm performance in both estimations.

To choose between the OLS and the estimation of the random effects, we then run the Breusch and Pagan Test right after each estimation of the random effects.

Table 1- 9 Breusch and Pagan Test for Equation [1]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	4.667766	2.160501
	e	2.008124	1.417083
	u	1.658585	1.287861
Test: **Var(u) = 0**			
		chibar2(01) =	5025.02
		Prob > chibar2 =	0.0000

Table 1- 10 Breusch and Pagan Test for Equation [2]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	4.656891	2.157983
	e	2.001321	1.414681
	u	1.662379	1.289333
Test: **Var(u) = 0**			
		chibar2(01) =	4982.14
		Prob > chibar2 =	0.0000

Table 1- 11 Breusch and Pagan Test for Equation [3]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	4.664487	2.159742
	e	2.004741	1.415889
	u	1.657304	1.287363
Test:	**Var(u) = 0**		
		chibar2(01) =	4993.9
		Prob > chibar2 =	0.0000

From the results of the Breusch and Pagan Tests, we observe that all the results indicate that p-value=0. These results reject the null hypothesis of no random effects; thus, OLS would have been inefficient. To further estimate, we proceed to the fixed effects models and employ the Hausman Test to find out which one is most suitable for the estimation.

Table 1-12 Hausman Test Results for Equation [1]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
pc	-0.23932	-0.2219	-0.01742	0.033605
lev	-0.4676	-0.97096	0.503362	0.067337
gro	0.36102	0.455502	-0.09448	0.016636
size	-0.71274	-0.74077	0.028027	0.018936
inde	-0.16203	-0.08713	-0.0749	0.020358
lms	0.088689	0.072922	0.015767	0.008021

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 149.05

Prob>chi2 = 0.0000

Table 1-13 Hausman Test Results for Equation [2]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
bpc	-0.23574	-0.20734	-0.0284	0.036353
bgen	-0.18205	-0.08288	-0.09917	0.064647
bage	0.014614	0.010637	0.003977	0.001893
lev	-0.50201	-0.98081	0.478797	0.067714
gro	0.384774	0.475786	-0.09101	0.016778
size	-0.73476	-0.75124	0.016473	0.019486
inde	-0.16457	-0.08773	-0.07684	0.020403
lms	0.089084	0.072583	0.016501	0.008055

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 154.26

Prob>chi2 = 0.0000

Table 1-14 Hausman Test Results for Equation [3]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
cpc	-0.14073	-0.15547	0.014737	0.033537
cgen	-0.08524	-0.05345	-0.03179	0.048514

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
cage	0.011155	0.012192	-0.00104	0.001601
lev	-0.48214	-0.96608	0.48394	0.068768
gro	0.376033	0.478507	-0.10247	0.017166
size	-0.72482	-0.75564	0.030825	0.019737
inde	-0.17383	-0.10006	-0.07378	0.02078
lms	0.088343	0.073119	0.015225	0.008132

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 142.54

Prob>chi2 = 0.0000

Based on the table above, we observe that the P-values of all three tests for each equation are zero. This means the results reject the random effects models in favour of the fixed effects models. Our further analysis then focuses on the results from the estimation of the fixed effects.

1.4.2 Empirical Results

Based on the discussion above, we find that the fixed effects model is most suitable for our dataset and estimations. Below is the result for all equations:

Table 1-15 Fixed Effects Estimation Results for All Equations

	Equation [1]	Equation [2]	Equation [3]
VARIABLES	Tobin's q	Tobin's q	Tobin's q
Political Connections	-0.239***		
	(0.0529)		
Board Chair's Political Connection		-0.236***	
		(0.0559)	
Board Chair's Gender		-0.182	
		(0.111)	
Board Chair's Age		0.0146***	
		(0.00327)	
CEO's Political Connection			-0.141**
			(0.0574)
CEO's Gender			-0.0852
			(0.0907)
CEO's Age			0.0112***
			(0.00315)
Leverage	-0.468***	-0.502***	-0.482***
	(0.118)	(0.119)	(0.120)
Growth	0.361***	0.385***	0.376***
	(0.0517)	(0.0519)	(0.0522)
Size	-0.713***	-0.735***	-0.725***
	(0.0264)	(0.0271)	(0.0273)
Board Independence	-0.162***	-0.165***	-0.174***
	(0.0365)	(0.0366)	(0.0370)
Management Shares	0.0887***	0.0891***	0.0883***
	(0.0102)	(0.0102)	(0.0103)
Constant	17.53***	17.43***	17.31***
	(0.559)	(0.570)	(0.568)
Observations	14,815	14,732	14,634
R-squared	0.280	0.277	0.279
Number of id	2,511	2,506	2,505

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 1-15 shows the empirical results of the estimations of the fixed effects on all three equations obtained in part three *Hypotheses, Data and Methodology*. Recall from part three; we can now re-write the models as follows:

$$FP_{it} = 17.53 - 0.239PC_{it} - 0.468LE_{it} + 0.361GRO_{it} - 0.713SIZE_{it} - 0.162INDE_{it} + 0.089MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [1]$$

$$FP_{it} = 17.43 - 0.236BPC_{it} - 0.182BG_{it} + 0.015BA_{it} - 0.502LE_{it} + 0.385GRO_{it} - 0.735SIZE_{it} - 0.165INDE_{it} + 0.090MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [2]$$

$$FP_{it} = 17.31 - 0.141CPC_{it} - 0.085CG_{it} + 0.011CA_{it} - 0.482LE_{it} + 0.376GRO_{it} - 0.725SIZE_{it} - 0.174INDE_{it} + 0.088MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [3]$$

Together with the detailed results in Table 1-15, we observe findings from various aspects that answer the hypotheses.

Political Connections and Firm Performance

Overall, the general political connections and the board chair's political connections are significantly negatively related to firm performance at the

highest 1% level (three-star) with the p-value less than 0.01. The CEO's political connection is also significantly negatively related to firm performance with a significance of 5% level (two-star) with a p-value less than 0.05. These findings support our hypotheses **H1**, **H2**, and **H3** as expected.

The evidence shows that firms with general political connections have a 23.9% decrease in performance on average compared with the firms that are not politically connected. The board chair's political connection brings an average decrease of 23.6% of firm performance, while the CEO's political connection brings an average decrease of 14.1% of firm performance. The findings suggest that the board chair's political connection is more powerful than that of the CEO's political connection. The evidence that the board chair has a more powerful influence on firm performance than the CEO's matches with our understanding of the Chinese setting. Not only did Chen et al. (2006) and Kato and Long (2006) define the board chair as the determining executive, but it is a fact that the board chair is the legal representative of the firm according to China's Corporate Law. In China's general practice, the board chair plays the leading role of a firm. Fighting for domination usually takes place around the position of the board chair.

There are some explanations for the results that political connections have a negative relationship with firm performance. Firstly, as proved by some scholars, politically connected firms are frequently linked with poor performance by financial means. They are found to have lower profitability or poorer stock returns (Faccio et al., 2006 and Fan et al., 2007). This may be due to the reason that those politically connected firms are more likely to be controlled by the government that have low operating efficiency. Moreover, these politically connected firms have more access to government

bailouts that leads to poor resource allocation.

The mechanism of firm performance affected by the political connection of the leaders is mainly via corporate governance. First, politically connected firms have less motivation to improve efficiency and performance. From the position of the firms, they are less motivated to improve their performance since it is easier for them to obtain benefits or financial support from the government even though they have poor performance, no matter in a financial crisis or under a normal economic situation. From the position of the leaders, they also have less motivation to improve the efficiency of the firms. It offers more stability for the board chair and the CEO to stay in their positions if they come with political connections since politically connected leaders are expected to bring extra benefits to the firm. Politically connected leaders are then more willing to maximize their personal benefits within the firm, which leads to a situation similar to the 'agency cost' issue.

Second, firms seeking politically connected leaders are usually either in a monopolistic competition environment or in a fierce competition environment where they need 'political connections' as extra help for their development. For the firms in a monopolistic competition environment, mostly SOEs, they lack the intrinsic demand to improve efficiency and performance. In industries like the energy industry, military industry, or public utilities industry, etc., firms have an absolute competitive advantage over other firms and are a certain scope of business considered strategically important with the government or authorities setting objectives. They are not motivated to improve their productivity. Their performance does not have much effect on their development plan or the resources they obtain from the government neither. Politically connected leaders bring bureaucracy in daily operations in the listed firms, which leads to poor performance. For private

firms that hire politically connected leaders, they are usually in a fierce competition environment where they need 'political connection' as extra help for their development. Regardless, they are firms that would like to enter a certain industry controlled by the government, or they are firms that hunger for resources, permits, or preferential benefits from the authorities. Politically connected leaders are the bridges to obtain these. In these kinds of firm, politically connected leaders focus more on those issues other than improving the efficiency of the firms. The features that make the politically connected leaders attractive are their network and ability to deal with the authorities; they do not even need expertise in the business. As a result of less professional leaders and less attention to the daily operations of the firms, the firm performance grows worse with politically connected leaders.

Finally, the reason people usually think that politically connected leaders are beneficial to the listed firms is that political connection is considered as an advantage when they seek a convenient relationship with the government under Chinese economic circumstances. However, they omit two possible disadvantages that come with politically connected leaders. The first one is the potential change of operating mode and the way of working brought by the politically connected leaders. As the top managers in a listed firm, the board chair and CEO strongly affect subordinates' working behaviour and ways of working. The Chinese governance system has been long accused of inefficiency by the public and media. As current or ex-politicians, the way that politically connected leaders work has a negative effect on the efficiency of their subordinates and the whole firm. Second, people usually focus on the benefit that the politically connected leaders bring for the firm but omit the potential costs associated with such benefits. Normally, politically connected leaders play as bridges between the authorities and the firm. However, to obtain such benefits, sometimes the listed firms must pay in

advance to exchange. This might be bribery in cash or assets to the government officials or transfer of the firm's own interests to exchange. Both the change of operating mode brought by the politically connected leaders and the potential costs needed to obtain the benefits lead to lower efficiency and poorer firm performance.

Personal Features of the Leaders and Firm Performance

Regarding hypothesis **H4** and **H5**, the results suggest that both male board chair and male CEO have a negative effect on firm performance while the leader's age has a significant positive effect on firm performance. The board chair and the CEO's age have a significant positive effect on firm performance at the highest 1% level since the p-value is less than 0.01. The findings indicate that having male leaders reduces the firm performance by 18.2% and 8.52%, respectively, from the effects of the board chair and CEO. The findings also suggest that one unit increase of the board chair's age improves firm performance by 1.46%, while one unit increase of the CEO's age improves firm performance by 1.12%. Both the effects are found to be significant at the 1% level (three-star).

Together these results suggest that a female board chair or CEO is better for firm performance. This finding is like Low et al. (2015), who imply that female directors on the board have a positive impact on firm performance; the sample of this research is also Asian list firms. More specifically regarding the CEO's gender, Lam et al. (2013) once focused on the effect brought by the CEO's gender on a firm's performance among Chinese listed firms. 4.4% of the CEOs in the sample are females, and their results show that the female CEO's impact and contributions are growing, especially in

privately controlled firms; the evidence they found is like what we found here. Female leaders are more patient and easier to follow the rules. Carefully working and planning will improve work efficiency and the possibility of success of a certain project. Following the rules makes female leaders role models for the subordinates and the whole firm to improve the firm's corporate governance environment and efficiency. This helps the firm performs better than other firms.

As to the age of the leaders, our empirical results show both the board chair's age and the CEO's age are significantly positively related to firm performance. Like the finding of Serfling (2014) that growing age reduces dicey behaviour, these results suggest that older leadership tends to bring better firm performance on ratios. Older leadership in Chinese listed firms tends to lower the firm's risk by safer investment policies. Thus, they bring better data for financial report and ratios to help to reduce the fluctuation of the stock return. Along with the increase in the leaders' age, they are relatively stable in their positions. They have less motivation to take high-risk projects or big changes in operating the firm. This helps reduce the possibility of a big loss of the firm. Older leaders help improve the firm's performance and reduce the potential risk.

It is notable that overall, the board chair's political connection and personal features bring more influence than those of the CEO's. Not only the board chair's political connection but also the gender and age all have relationships with firm performance. Among which the effects of political connection and age have the strongest significant influence on firm performance.

Interaction Effect between Gender, Age and Political Connection

To further investigate hypothesis **H4** and **H5**, we apply estimations on the interaction effects between gender, age, and political connections in both Equation [2] and Equation [3].

Board Chair

We firstly focus on the interaction effects between gender, age, and political connections of the board chair. The results of the interaction effects are showing in the table below:

Table 1-16 Political Connection x Gender (Board Chair)

Political Connection x Gender	Coef.	P-value
Politically Connected x Male	-0.43819	0.002
Politically Connected x Female	-0.30311	0.166
No Political Connection x Male	-0.20699	0.128
No Political Connection x Female	Omitted	Omitted

In the results above, 'political connection' refers to the board chair's political connection, which is a dummy variable that equals one if the board chair is politically connected and zero otherwise; 'gender' refers to the board chair's gender, which is a dummy variable that equals one if the board chair is male and zeroes otherwise. Thus, we have four combinations in the group which are:

(one, one) – politically connected male board chairs.
(one, zero) – politically connected female board chairs.

(zero, one) – male board chairs without political connection.

(zero, zero, Omitted) – female board chairs without political connection.

We observe that between political connection and gender, politically connected male board chair has a significant negative effect on firm performance at the highest 1% level. The patterns of politically connected female board chair and non-politically connected male board chair are in line with the main results. The results for non-politically connected female board chairs are omitted as both the values of the dummy variables are zero. A politically connected male board chair brings an average decrease of 43.82% of firm performance. It is also in line with the main results that it is better for the firms to have female leaders. Compared with the main results considering political connection and gender separately, the political connection has more influence on firm performance when the board chair is male. When the board chair is female, and the board chair has no political connection, the board chair's gender does not significantly hurt firm performance.

Table 1-17 Political Connection x Age (Board Chair)

Political Connection x Age	**Coef.**	**P-value**
Politically Connected x Age	0.011688	0.000
No Political Connection x Age	0.015746	0.000

In the results above, 'political connection' refers to the board chair's political connection, which is a dummy variable that equals one if the board chair is politically connected and zero otherwise; 'age' refers to the board chair's age. 'Politically Connected x Age' refers to the board chair's age, and the board chair is politically connected, while 'No Political Connection x Age' refers to the board chair's age, and the board chair is non-politically connected.

For the interaction effect between political connection and age, we observe that no matter the board chair is politically connected or not, age significantly positively related to firm performance at the highest 1% level. For politically connected board chairs, one unit increase of their age brings 1.17% of the increase in firm performance. For non-politically related board chairs, one unit increase of their age brings 1.57% of the increase in firm performance. These are in line with the main results indicating that senior leaders improve firm performance. Compared with the main results considering political connection and age separately, the age of politically connected board chair has slightly less influence on firm performance while the age of non-politically connected board chair has slightly more influence on firm performance. The impact of the board chair's age is still significantly positive regardless of the board chair's political connection.

Table 1-18 Age x Gender (Board Chair)

Age x Gender	**Coef.**	**P-value**
Age x Male	0.014375	0.000
Age x Female	0.017106	0.000

In the results above, 'age' refers to the board chair's age; 'gender' refers to the board chair's gender, which is a dummy variable that equals one if the board chair is male and zeroes otherwise. 'Age x Male' refers to the board chair's age and the board chair is male, while 'Age x Female' refers to the board chair's age and the board chair is female.

The table shows that age is significantly positively related to firm performance no matter whether the board chair is a male or a female. It shows that a one-unit increase of the male board chair's age brings a 1.44% increase in firm performance, while a one-unit increase of the female board

chair's age brings a 1.71% increase in firm performance. These indicate that senior leaders improve firm performance, which is in line with the main results. Compared with the main results considering age and gender separately, the age of the board chair has slightly less influence on firm performance when the board chair is male. The age of the board chair has slightly more influence on firm performance when the board chair is female. Both influences are positive that improve firm performance.

CEOs

We then further investigate the interaction effects between gender, age, and political connections among the CEOs of the firms. The results of the interaction effects are showing in the table below:

Table 1-19 Political Connection x Gender (CEO)

Political Connection x Gender	Coef.	P-value
Politically Connected x Male	-0.21266	0.060
Politically Connected x Female	-0.06111	0.776
No Political Connection x Male	-0.06637	0.520
No Political Connection x Female	Omitted	Omitted

In the results above, 'political connection' refers to the CEO's political connection, which is a dummy variable that equals one if the CEO is politically connected and zero otherwise; 'gender' refers to the CEO's gender, which is a dummy variable that equals one if the CEO is male and zeroes otherwise. Thus, we have four combinations in the group which are:

(one, one) – politically connected male CEOs.
(one, zero) – politically connected female CEOs.

(zero, one) – male CEOs without political connection.

(zero, zero, Omitted) – female CEOs without political connection.

From the tables above, we observe that between political connection and gender, politically connected male CEOs have a significant negative effect on firm performance at the 10% level. The patterns of politically connected female CEOs and non-politically connected male CEOs are in line with the main results. The results of non-politically connected female CEOs are omitted as both the values of the dummy variables are zero. Politically connected male CEOs bring an average decrease of 21.27% of firm performance. It is in line with the main results that it is better for the firms to have female leaders. It also indicates that the impact of the CEOs is less than that of the board chair. Compared with the main results considering political connection and gender separately, the political connection has less influence on firm performance when the CEO is male. When the CEO is female, and the CEO has no political connection, the CEO's gender still does not significantly affect firm performance.

Table 1-20 Political Connection x Age (CEO)

Political Connection x Age	**Coef.**	**P-value**
Politically Connected x Age	0.008944	0.004
No Political Connection x Age	0.01152	0.000

In the results above, 'political connection' refers to the CEO's political connection, which is a dummy variable that equals one if the CEO is politically connected and zero otherwise; 'age' refers to the CEO's age. 'Politically Connected x Age' refers to the CEO's age, and the CEO is politically connected, while 'No Political Connection x Age' refers to the CEO's age and the CEO is non-politically connected.

Regarding the interaction effect between political connection and age, we observe that no matter the CEO is politically connected or not, age significantly positively related to firm performance at the highest 1% level. For politically connected CEOs, one unit increase in their age brings 0.89% of the increase in firm performance. For non-politically related CEOs, a one-unit increase in their age brings 1.15% of the increase in firm performance. These are in line with the main results that indicate that senior leaders improve firm performance. Compared with the main results considering political connection and age separately, the age of politically connected CEO has slightly less influence on firm performance while the age of non-politically connected CEO has slightly more influence on firm performance. The impact of the CEO's age is still significantly positive regardless of the CEO's political connection.

Table 1-21 Age x Gender (CEO)

Age x Gender	**Coef.**	**P-value**
Age x Male	0.01104	0.000
Age x Female	0.012646	0.001

In the results above, 'age' refers to the CEO's age; 'gender' refers to the CEO's gender, which is a dummy variable that equals one if the CEO is male and zeroes otherwise. 'Age x Male' refers to the CEO's age and the CEO is male, while 'Age x Female' refers to the CEO's age and the CEO is female.

For the interaction effect between gender and age of the CEO, the table shows that age is significantly positively related to firm performance no matter whether the CEO is male or female. It shows that a one-unit increase of the male CEO's age brings a 1.10% increase in firm performance, while

a one-unit increase of the female CEO's age brings a 1.26% increase in firm performance. These results indicate that senior leaders improve firm performance, which is in line with the main results. Compared with the main results considering age and gender separately, the age of the CEO has slightly less influence on firm performance when the CEO is male. The age of the CEO has slightly more influence on firm performance when the CEO is female. Both influences are positive that improve firm performance.

Controlling Variables

Regarding the controlling variables, they show the same direction and significance in all three equations. All the controlling variables in all three equations have the highest significance at the 1% level (three-star).

The evidence shows that growth and management shares have a significant positive relationship with firm performance. This means higher growth rate and more management shares are beneficial for the firms to improve performance. For example, a one-unit increase of management shares improves the firm's performance by 8.9%, 8.9%, and 8.8%, respectively, in Equations [1], [2], and [3]. Leverage, firm size and board independence have a significant negative effect on firm performance, which indicates that lower leverage, smaller size and less board independence are better for improving firm performance.

Endogeneity Problem

The current regression model and the results above may have an endogeneity

problem, especially for SOEs. As many board chair and CEOs of Chinese listed firms with political connections are appointed by the State-owned Assets Supervision and Administration Commission (SASAC). The possible reason is that politically connected leaders are sent by the SASAC to poorly perform state-owned firms to save the firm or improve the firm's performance.

On reflection about this, we feel that firstly, not all the politically connected board chairmen and CEOs are appointed directly by SASAC. In this essay, politically connected firms are defined as firms whose board chairman or CEO has political connections quite clearly. For example, if either the firm's board chairman or CEO are politically connected, the firm is considered a politically connected firm. We further divide the definition of the leader's political connections into three categories: first, whether he or she is a current or ex-government official at any levels; second, if he or she is a current or ex-member of National People's Congress (NPC) or Chinese People's Political Consultative Conference (CPPCC); third, he or she is a current or ex-member of the military department with equivalent government official levels. Even if all the leaders are appointed by the SASAC with political connections in the listed SOEs, then it is a prescribed procedure for every listed SOE regardless of its performance. For all the listed SOEs, they would get a politically connected leader each time, no matter whether they perform well or not.

Finally, it is also perhaps worth noting that the SASACs were specifically set up to separate direct government control from portfolio asset management on behalf of the state. However, endorsement by the state (and government) is implied when an SOE board chair or CEO changes, because the SASAC manages assets on behalf of the state (or municipality), it is less

direct evidence of the particular manager's political connection than an observed direct party membership or military service history in the secondary data. Further mechanics of the processes of transition are set out below.

For all the politically connected leaders, either current or ex-government officials, there is usually a switch from 'politician' to leader of a listed firm under three circumstances. First, the current or ex-politicians are appointed directly by the related institution or government organization. Second, the current or ex-politicians are switching to the business they once engaged in due to their official political service; or choose to join the business persuaded or motivated by their personal network/relationship built during their political service. Third, the ex-politicians may simply quit the political job and choose to start their own venture or find a new job as the board chairman/CEO for better fortune; in some cases, the ex-politicians may have quit for a long time and experienced different other works before they turn to be the board chairman/CEO of a listed firm.

Thus, the politically connected leaders are not all appointed by the government but often switch based on their own wills or other driving forces. It is not necessary that the firms they choose performed badly in the past; it is also possible that the firms simply would like to improve their performance to a higher level with the advantages of political connection.

Secondly, especially within the second category of NPC/CPPCC type political connection where the politically connected leaders are current or ex-members of NPC/CPPCC, many leaders are elected to be the members of NPC/CPPCC because of their successful operation of the listed firms. Many of the leaders are the founder-managers of the listed firms; they are not

appointed by the government but obtaining political connection after their success. Their firms are usually the 'Leading Enterprise' in the local area with huge achievements and good performance. This phenomenon also applies to the third category of political connection, where the politically connected leaders are current or ex-member of the military department with equivalent government official levels. Many cases of this kind started when the military officers demobilized. The allocation of demobilized military officers to local firms is not based on firm performance. Especially, high-rank officers with honours are more likely to be allocated to a high position in firms with good performance. Thus, being a politically connected board chairman or CEO is not necessarily linked with government appointment or previous firm performance.

Thus, politically connected board chairmen and CEOs are not all appointed by the government but very often switch or rotate out of other positions from their own will or by way of other driving forces. It is not necessarily the case that the firms they choose performed badly in the past, nor that SASAC endorsement means politically connected individuals are sent to poor-performing firms. Many leaders are elected to be members of NPC/CPPCC because of their successful operation of the 'Leading Enterprise' in the local area. They obtain political connections after them being a successful board chairman or CEO. Even if all the leaders are appointed by the SASAC with political connections in the listed SOEs, then it is the prescribed procedure for every listed SOEs regardless of their performance. For all the listed SOEs, they will get a politically connected leader each time, no matter whether they perform well or not. Thus, being a politically connected board chairman or CEO is not necessarily linked with government appointment or previous firm performance.

1.4.3 Robustness Tests

To test the robustness of the main results, we first ran the estimation of the fixed effects with clustered standard errors to see whether there are any material changes in the results; then, we replaced the dependent variable with an alternative measurement of firm performance and tested all three equations; finally, we further divided the dataset into two sub-samples (SOEs and Non-SOEs) and investigated the results in order to understand whether the nature of ownership of the firms constitutes a significant impact on firms' performance.

1.4.3.1 Fixed Effects Estimation with Clustered Standard Errors

We first applied *fe vce(robust)* code in STATA after all three equations, which will automatically give standard errors clustered at the id level to see whether there are any material differences between the main results and the results from this estimation. The robustness is meant to allow for violations of homoscedasticity in the cross-sectional dimension or heteroscedasticity. *vce(robust)* uses the robust White/sandwich estimator of variance that gives 'robust' standard errors, which are robust to some types of misspecification and remove the effects brought by the potential outliers.

The results of the estimation of the fixed effects with clustered standard errors are shown below:

Table 1-22 Fixed Effects Estimation with Clustered Standard Errors

	Equation [1]	Equation [2]	Equation [3]
VARIABLES	Tobin's q	Tobin's q	Tobin's q
Political Connections	-0.239***		
	(0.0840)		
Board Chair's Political Connection		-0.236**	
		(0.0945)	
Board Chair's Gender		-0.182	
		(0.198)	
Board Chair's Age		0.0146***	
		(0.00555)	
CEO's Political Connection			-0.141*
			(0.0840)
CEO's Gender			-0.0852
			(0.144)
CEO's Age			0.0112**
			(0.00499)
Leverage	-0.468***	-0.502***	-0.482***
	(0.323)	(0.328)	(0.333)
Growth	0.361***	0.385***	0.376***
	(0.0717)	(0.0716)	(0.0722)
Size	-0.713***	-0.735***	-0.725***
	(0.0621)	(0.0625)	(0.0628)
Board Independence	-0.162***	-0.165***	-0.174***
	(0.0529)	(0.0527)	(0.0547)
Management Shares	0.0887***	0.0891***	0.0883***
	(0.0211)	(0.0210)	(0.0208)
Constant	17.53***	17.43***	17.31***
	(1.298)	(1.354)	(1.302)
Observations	14,815	14,732	14,634
R-squared	0.280	0.277	0.279
Number of id	2,511	2,506	2,505

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From the table above, we observe that the estimation of the fixed effects with clustered standard errors shows the same pattern as the main results. For the

relationship between the general political connection and firm performance, the negative effect stays at the highest 1% level and indicates the general political connection brings an average decrease of 23.9% of firm performance. As to the negative effects brought by the board chair and CEO's political connection, the significance still shows a significant impact, but at 5% and 10% respectively this time. The effects brought by gender and age show the same patterns. The results show that male leaders bring a negative influence on firm performance while senior leaders improve firm performance. The table shows that the age of the board chair has a significant positive relationship with the firm performance at the highest 1% level, while the CEO's age has a significant positive relationship with the firm performance at the 5% level. A one-unit increase of the board chair's age and the CEO's age brings a 1.5% and 1.1% respective increase in firm performance.

1.4.3.2 Fixed Effects Estimation on Alternative Measurement of Firm Performance

To further investigate the robustness of the main results, we employed an alternative measure of firm performance to see whether there are any big changes from the main results. In this case, we employed Return on Equity as the alternative measurement of firm performance.

According to Woolridge and Gray (2006), return on equity (ROE) is a financial ratio calculated as the net income of the firm divided by its shareholder's equity. It measures firm performance by indicating the profitability of the firm in relation to the equity. Since shareholder's equity is calculated as the firm's assets minus its liabilities, return on equity is

considered to measure the profitability of the firm on its net assets. We firstly re-estimate all three equations using return on equity (ROE) as the alternative dependent variable while keeping the remaining all the same as the main estimation. The results are shown below:

Table 1-23 Fixed Effects Estimation Results on ROE

	Equation [1]	Equation [2]	Equation [3]
VARIABLES	ROE	ROE	ROE
Political Connections	0.00844*		
	(0.00490)		
Board Chair's Political Connection		0.00602	
		(0.00515)	
Board Chair's Gender		-0.00780	
		(0.0105)	
Board Chair's Age		0.00110***	
		(0.000303)	
CEO's Political Connection			0.00330
			(0.00528)
CEO's Gender			-0.0205**
			(0.00849)
CEO's Age			-.0000185
			(0.000288)
Leverage	-0.106***	-0.101***	-0.111***
	(0.0107)	(0.0107)	(0.0108)
Growth	0.0881***	0.0883***	0.0882***
	(0.00493)	(0.00492)	(0.00493)
Size	-0.0194***	-0.0216***	-0.0197***
	(0.00249)	(0.00253)	(0.00254)
Board Independence	-0.00252	-0.00189	-0.00145
	(0.00344)	(0.00343)	(0.00343)
Management Shares	0.000967	0.000878	0.00147
	(0.000961)	(0.000959)	(0.000963)
Constant	0.516***	0.513***	0.538***
	(0.0525)	(0.0533)	(0.0529)
Observations	13,909	13,833	13,741
R-squared	0.040	0.040	0.042
Number of id	2,360	2,356	2,354

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From the table above, we observe that most of the patterns are the same as the main results except for the political connection variables and the CEO's age. All three political connection variables show a positive effect on firm performance, while the CEO's age shows a negative effect on firm performance but is not significant. The results continue to show that male leaders bring a negative effect on firm performance while the board chair's age has a significant positive relationship with the firm performance at the highest 1% level. The impact of the CEO's gender is significant at a 5% level, indicating that male CEOs bring an average 2.05% decrease in firm performance.

1.4.3.3 Fixed Effects Estimation on Alternative Measurement of Firm Performance – SOEs vs Non-SOEs

From the above results, we find that there are some differences from our main results. To find out the reason that causes the difference, we further divide the sample into two groups: SOEs and non-SOEs and run the same estimations separately in two sub-samples. The key results are shown in the table below:

Table 1-24 Fixed Effects Estimation Results on ROE: SOEs vs Non-SOEs

Main Variables	SOEs		Non-SOEs	
	Coef.	P-value	Coef.	P-value
Political Connections	-0.004916	0.501	0.020332	0.003
Board Chair's Political Connection	-0.007791	0.293	0.021079	0.007
Board Chair's Gender	-0.033380	0.050	-0.009896	0.450

Main Variables	SOEs		Non-SOEs	
	Coef.	P-value	Coef.	P-value
Board Chair's Age	0.001699	0.002	0.000299	0.401
CEO's Political Connection	-0.014916	0.092	0.015316	0.017
CEO's Gender	-0.013305	0.397	-0.023408	0.015
CEO's Age	0.000769	0.160	-0.000641	0.047

*the control group (leverage, growth, firm size, board independence, and management shares) is also controlled, showing the same pattern.

From the table, we observe that the pattern of the results of SOEs is the same as the main results supporting our findings. In the sub-sample of the SOEs, all the political connection variables are negatively related to firm performance in which the effect of the CEO's political connection is significant at the 10% level. The board chair's gender has a negative impact on firm performance at the 5% level, while the board chair's age has a positive impact on firm performance at the 1% level. This indicates that female and senior board chair is better for the listed firms. For the effect of the CEO's features, we find that male CEOs lead to a decrease in firm performance while senior CEOs improve firm performance. The findings in sub-sample SOEs support our main results and have the same pattern as the main results in all three equations.

When we move to the sub-sample of non-SOEs, we find that all political connection variables are significantly positively related to firm performance at 1%, 1%, and 5% level, respectively, indicating that political connection significantly improves firm performance among non-SOEs. Since their significant levels are much higher than those of the SOEs, the results of non-SOEs 'covered' that of the SOEs and made the overall result positive in Table 1-23. Apart from the political connection variables, the table shows that male

leaders have a negative effect on firm performance, which is in line with the previous results. The only difference is that among non-SOEs, the CEO's age has a significant negative effect on firm performance at a 5% level.

The effect of political connections in SOEs can be unfavourable. Scholars usually link political connections in SOEs to a higher level of government involvement in daily operations (Fan et al., 2007; Frye and Shleifer, 1997; Hung et al., 2012; Shleifer and Vishny, 1998). Besides, politically connected leaders in SOEs are more likely to be less focused on corporate governance while paying more attention to their private benefits, including political promotion or financial bribe (Conyon and He, 2011; Tu et al., 2013). What is more, SOEs are defined as the firms whose controlling shareholder is the State. They then have less motivation to achieve a better firm performance which is the wish of other small shareholders (Berkman et al., 2010; Jiang et al., 2010).

There are several reasons that make political connections significantly positively related to firm performance among non-SOEs. First, from the industry level, non-SOEs are more likely to be in an industry where the competition is much more intense than industries dominated by SOEs. In an industry dominated by SOEs, resource allocation and business scale are relatively fixed. The resources allocated to SOEs are more than the resources allocated to non-SOEs generally (Nee, 1992). However, in a highly competitive non-SOE industry, having a political connection or not is a key issue that makes some firms competitive over others. Faccio et al. (2006) investigate the probability for a firm to get government bailouts to reverse its financial performance. They find that firms with political connections have a significantly higher probability of obtaining government bailouts. Having a political connection becomes a key advantage when a firm compete

for resource, permits, benefits, and much more.

Secondly, leaders' political connection plays a more important role among non-SOEs compared with that of SOEs. Unlike the SOEs that are considered as 'naturally' politically connected, a politically connected leader is sometimes the only and most direct political connection that non-SOEs can obtain. This makes the effect of the politically connected leaders incredibly significant among non-SOEs. For example, for the SOEs, politically connected leaders may not be the only political connection they could use when they seek resource allocation or benefits. However, for non-SOEs, they are not in the political system at all to obtain an advantage naturally'. For example, Francis et al. (2009) focus on the effect of political connections on a firm's IPO process in Chinese stock markets. The results show strong evidence that such politically connected firms grab significant favourable benefits when they go public. These firms tend to have higher IPO price, less chance to be under-priced, and lower fixed costs. Li and Zhou (2015) find similar evidence as well, using a dataset of private firms. The politically connected leader is the key to help the firms become competitive, fighting for benefits and long-term development.

From the firm level, thirdly, hiring politically connected leaders among non-SOEs is more likely a purposeful strategy for the firms. Unlike in the SOEs, where the direct appointment of politically connected leaders could happen, politically connected leaders in non-SOEs are most often driven by personal motivations or recruitment. The firms have a clear strategy for the politically connected leaders to help the firm. For example, according to Chen et al. (2011), private firms tend to use their political connection to grab benefits from the government or local authority via rent-seeking. In other words, they are joining the firms with targets. Thus, their effect on firm performance is

concentrated in a positive direction.

Finally, non-SOEs have different features compared with SOEs. The SOEs are widely considered as low efficiency' just like the government and the whole political system. Li et al. (2008) also found that political connection has a negative effect on firm performance, but the evidence was only found in the SOEs. Non-SOEs are much better on this point as they do not have back-up from the government of their performance and operating. They have a natural motivation to improve their efficiency to perform better and achieve their short-term and long-term goals. If they fail to do so, they will be abandoned by the investors and be eliminated by the market. Thus, their high efficiency and operation mode or system offset the potential negative effects brought by the politically connected leaders.

As to the reason that younger CEO is better for firm performance in non-SOEs, we investigate this issue from three aspects. First, from the industry level, non-SOEs are more likely in an industry that is more competitive and dynamic. This environment requires firms to be dynamic and ready to react to daily challenges and changes in the environment. Younger CEOs bring more fresh ideas and potential solutions that help the firm to perform better under these circumstances. These industries are not as conservative as that of the SOEs where age hence experience plays a more important role. Younger CEOs in non-SOEs help the firm to stay competitive and active to perform better and survive in their industry. Second, from the firm leaders' level, CEOs are more likely to be the ones who are responsible for specific affairs and daily operations. Younger CEOs have better energy and the ability to accomplish multiple tasks. We have discussed earlier the roles of the board chair and the CEO play are different. Generally, in Chinese society, the board chair is usually considered as the top leader who is more powerful. In a

highly 'politically connected' system like SOEs, the role that CEOs play is limited and less important in the daily decision-making process. However, in non-SOEs, many firms are much closer to the way of operating of listed firms in developed countries where CEOs play a more important role. The board chair may still be the one who makes the final decision, but the younger CEO participant more in making operating decisions, raising projects, and managing specific affairs. Hence, a younger CEO has more motivations to help the firm perform better to realize their values to stay in their position. Finally, from the aspect of the features of younger CEOs, they are more likely to contact new knowledge and advanced operating methods of listed firms. Their updated knowledge brings fresh energies and possibilities to the firms, which are essential and important for non-SOEs to survive in the market. Thus, younger CEOs help to improve firm performance in non-SOEs.

From the analysis above, we found support for our main results from the fixed effect estimation with clustered standard errors and alternative estimation replacing the dependent variable with ROE. The results of the non-SOE sub-sample show some differences, which are explained above.

The reason that we chose Tobin's Q ratio as the dependent variable, not ROE, is that accounting ratios like ROE have some disadvantages in measuring firm performance. Firstly, since ROE is calculated as the firm's net income divided by shareholder's equity, it has similar disadvantages when using net income as the measure of firm performance. The main debate that accounting ratio analysis is not the best way to measure firm performance is whether stock returns are more highly associated with net income or alternative measurements. For example, Araújo and Machado (2018) looked at data from the Brazilian stock market and indicated that ROE could only explain

part of the variations of Brazilian stock returns when used in conjunction with proxies for risk factors. Damodaran (2007) also indicated that ROE is 'editable' through different methods (e.g., making up net income on the balance sheet).

In addition to the unreliable data aspect of net income, ROE has more disadvantages in measuring firm performance. First, ROE is sensitive to leverage. In a situation where the firm can use the fund efficiently and obtain a higher rate of return on the borrowing than the borrowing rate, ROE will increase along with the leverage. Second, ROE depends on many other factors like depreciation, the growth rate of investment, project life, capitalization policy, and the lag between investment outlays and their recoupment, etc. For example, faster depreciation rates and faster-growing rate of the investment will lead to a lower ROE, while longer project life, smaller capitalized investment, and a longer lag between investment outlays and their recoupment will result in an overstated ROE.

From the analysis above, we found that the estimation of the fixed effects with clustered standard errors shows the same pattern and similar significance compared with our main results, which support our findings. When we replaced the dependent variable with ROE and applied the same estimation, we found that the results for the SOEs sub-sample show the same patterns as our main results, indicating the same findings. Due to the disadvantages of ROE in measuring firm performance, Tobin's Q is considered the better way to measure firm performance, and our main results are considered to be the more robust.

1.5 Conclusion

This paper estimated the effects of the leadership's political connections and personal characteristics on firm performance in Chinese listed firms. The study period is 2006-2016, and the sample includes all the listed firms in China's Shanghai and Shenzhen stock exchanges to obtain a comprehensive understanding of the topic. It employed panel data methodology and the estimation of the fixed effects on three models to examine the hypotheses.

In the estimations, firm performance is the dependent variable measured by Tobin's Q ratio, while the independent variables contain two groups: the main variables and the controlling group. The main variables in this paper include the leadership's political connections, gender, and age, where the leadership refers to the board chair and the CEO in the listed firm. The controlling group includes leverage, size, growth, board independence and management shares of the firm.

Overall, the general political connections and the board chair's political connections are significantly negatively related to firm performance at the highest 1% level (three-star). The CEO's political connection is also significantly negatively related to firm performance with a significance of 5% level (two-star). This may be due to the reasons that, first, those politically connected firms are more likely to be controlled by the government that have low operating efficiency; second, these politically connected firms have more access to government bailouts that leads to poor resource allocation; and at last, the politically connected firms have less motivation to improve the efficiency and performance. The findings also suggest that the board chair's political connection is more powerful than that of the CEO's political connection.

The results show that both male board chairs and male CEOs have a negative impact on firm performance. The board chair and the CEO's age have a significant positive effect on firm performance at the highest 1% level. Together these results suggest that a female board chair or CEO is better for firm performance. Older leadership also tends to bring better firm performance on ratios.

For the control group, the evidence shows that growth and management shares have a significant positive relationship with firm performance. While leverage, firm size and board independence have a significant negative effect on firm performance, which indicates that lower leverage, smaller size, and lower board independence are better for improving firm performance.

Although the relationship between political connection and firm performance has increasingly been mentioned in the research, researchers either employ a sample with missing data that might not show comprehensive results, or they rarely put the leadership's political connections and their personal characteristics jointly together to estimate the corresponding effect on firm performance, especially in Chinese stock markets.

This essay uses the Production Function framework to start with and extends the current understanding of the topic by manually collected political connection variables with a developed definition of political connection. In this essay, a leader is considered as politically connected if he or she is 1) a current or ex-government official at all levels including current or ex-members of the military department with equivalent government official levels; 2) a current or ex-member of NPC; 3) a current or ex-member of

CPPCC. A negative relationship between political connection and firm performance is found. We further conduct a sub-sample test dividing the dataset into SOEs and Non-SOEs. Evidence is found that political connection has a negative effect on firm performance among SOEs while has a positive effect on firm performance among non-SOEs. Hence, this essay filled a gap concerning the relationship between political connections of leadership, personal characteristics, and firm performance in Chinese listed firms.

The findings in this paper offer a comprehensive view of the effects of the leadership's political connection and personal characteristics in Chinese listed firms. Evidence also shows that the board chair has more influence than the CEO in the Chinese setting, given they are both engaged in the firm's operation. These findings also give trading strategies for investors and policy implications for the authorities.

However, a limitation of this paper is that the study is not tested under different definitions of variables and sub-samples. As to the relationship between the leadership's political connection and firm performance, the analysis is based on purely dummy variables of the board chair's political connection, the CEO's political connection and the general political connection. There is no distinction between the degrees of the connection and detailed analysis of different firm groups. Thus, future work needs to be planned to remedy these limitations.

Appendix

Correlation Coefficient of the Variables – Chapter 1

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1												
2	-0.0989	1											
3	-0.0886	0.9072	1										
4	-0.0041	0.0088	0.0069	1									
5	-0.0746	0.1455	0.1429	0.0322	1								
6	-0.0295	0.5832	0.4008	0.0008	0.0489	1							
7	-0.0291	-0.0030	0.0122	0.2334	-0.0182	-0.0252	1						
8	-0.0608	0.0373	0.0235	0.0241	0.2812	0.1261	0.0192	1					
9	-0.3708	0.0535	0.0451	0.0224	-0.0198	-0.0053	0.0333	0.0349	1				
10	0.0479	0.0088	0.0151	0.0017	-0.0303	0.0179	-0.0150	-0.0384	-0.0288	1			
11	-0.4946	0.1111	0.1162	0.0196	0.1707	0.0142	0.0407	0.1523	0.4355	0.1389	1		
12	-0.1914	0.0915	0.0945	0.0172	0.0647	0.0234	0.0296	0.0813	0.2107	-0.0203	0.3693	1	
13	0.2146	-0.0337	-0.0173	-0.0252	0.0141	0.0398	-0.0508	-0.0562	-0.3644	0.1635	-0.1366	-0.1533	1

*1: Tobin's Q Ratio; 2: Political Connection; 3: Board Chair's Political Connection; 4: Board Chair's Gender; 5: Board Chair's Age; 6: CEO's Political Connection; 7: CEO's Gender; 8: CEO's Age; 9: Leverage; 10: Growth; 11: Firm Size; 12: Board Independence; 13: Management Shares.

Chapter 2

Political Connections, Government Ownership and Cost of Debt: Evidence from China

2.1 Introduction

The cost of debt is the interest payment of a firm for its debt financing. Debt can be classified as short-term debt and long term-debt according to maturity. Short-term debt refers to debt that is due within one year, while long-term debt refers to the debt that lasts more than one year.

Studying the cost of debt is particularly important as finding out the influencing factors of the cost of debt helps the firms reduce financing costs and improve the profit. It also gives suggestions to investors and institutions to help them build good portfolios. Although the cost of debt has increasingly been mentioned in the research, extant research shows conflicting results. Some scholars indicate that political rights and political connections help the firm reduce the cost of debt in the credit market and obtain more preferential loans (Qi et al., 2010; Yeh et al., 2013; Infante and Piazza, 2014; Khwaja and Mian, 2005; and Claessens et al., 2008). However, Liu et al. (2016) and Bliss and Gul (2012) insist that political connections do not help firms obtain benefits in financing even a higher interest rate. Other arguments exist that some scholars find that government ownership, control right, and misreporting increase the firm's cost of debt (Borisova et al., 2015; Lin et al., 2011a; and Graham et al., 2008) while scholars like Cull et al. (2015) indicate that government ownership is related to less financial constraints.

The reason why political connections and corporate governance are likely to affect the cost of debt has been mentioned in recent literature. For the relationship between political connection and the cost of debt, political connections are shown to bring benefits like lower interest rates (Infante and Piazza, 2014), lower tax rates (Faccio, 2010), more chance to obtain a government bailout (Faccio, 2006), preferential bank loans (Yeh et al., 2013;

Khwaja and Mian, 2005; Firth et al., 2009; Sapienza, 2004), easier access to external financing (Claessens et al., 2008; Boubakri et al., 2012a; Boubakri et al., 2012b; Johnson and Mitton, 2003; Hearn, 2012), and potential financial or regulatory treatment from authorities (Faccio et al., 2006; Johnson and Mitton, 2003; Bunkanwanicha and Wiwattanakantang, 2009). The political connections of the leaders are converted to the convenience of obtaining a lower interest rate in many ways. If the leaders are current government officials appointed as the firm's managers, they may have the position convenience to obtain low-interest loans from the government. If the leaders are former government officials, they can still use the relationship-based network to obtain a low interest rate. The benefit of political connections is an aggregate of the system advantage they build when working in different social sectors and the information advantage they obtain when working as government officials. The information advantage lasts though they no longer work in the government. As to the relationship between corporate governance and the cost of debt, scholars suggest that better corporate governance is linked with a lower cost of debt or cost of equity (Chen et al., 2009; Klock et al., 2005; Ashbaugh-Skaife et al., 2006; and Chava et al., 2009). Firms with good corporate governance are considered to have higher efficiency, more access to funding resources, and more low-cost financial sources.

Common measures of corporate governance come from many aspects like ownership structure, board structure, and management structure (power distribution). Independent directors, independence of committees, the board size, split of board chair and CEO roles, attendance and quality of board meetings, and auditors' reputation are key elements to build strong corporate governance (Khanchel, 2007). Many of the corporate governance variables above have been mentioned to affect the firm’s cost of debt. Some scholars

suggest that government ownership is linked to a higher debt cost but less financial constraints (Borisova et al., 2015; Cull et al., 2015; Bliss and Gul, 2012). Lin et al. (2013) further suggest that the firm's biggest ultimate controller negatively affects the firm's independence on debt from the bank. When it comes to board independence, scholars point out that board independence has a negative effect on the cost of debt since it reduces the risk of the firm and improves the financial report quality, which is valued by the market and credit rating institutions (Johnson and Mitton, 2003; Faccio, 2006; Bliss and Gul, 2012). Wang (2015) further suggest that firms with politically connected independent directors are at an advantage in obtaining debt financing and financial treatments in Chinese stock markets, especially among the firms controlled by the local government. As to the quality of the auditors, Kisgen and Strahan (2010) studied the changes after the US Securities and Exchange Commission endorsed a 4th credit rating agency in 2003. They observe that with one level higher rating given results in a 39 base-point lower cost of capital of a firm. Graham et al. (2008) also find evidence that strongly shows that when a firm is issued a loan after its misreporting, it faces a significantly higher debt cost. The cost of debt is notably higher for the firms that cheating on the report. The split of board chair and CEO roles, or 'CEO Duality', is also an important measure of corporate governance. Johnson and Mitton (2003) and Faccio (2006) insist that CEO duality has a positive relationship with the cost of debt, while Bliss and Gul (2012) find that CEO duality is negatively related to the cost of debt. But the interaction effects show that CEO duality increases the firm's risk; hence, the firm is requested a higher interest rate for borrowing. They also conclude that lenders and credit rating institutions treat board independence to be beneficial for the firm to reduce risk.

Political connection is increasingly considered an important influencing factor of the cost of debt. Extant research shows that political connection is beneficial to firms since it can bring advantages during financing progress, obtaining government bailouts, and regulation exceptions. However, there are also scholars who indicate that political connection has no effect on the firm's cost of debt. This happens even when scholars employ the same definition of the political connection but apply tests to different countries and economies.

Thus, we find that the current literature is limited on this issue; and that the relationship between political connection and the cost of debt in China is not widely mentioned. Some studies investigate the political connections in Chinese listed firms, but they ignore their effect on the cost of debt. While other studies try to investigate the cost of debt, but they focus more on the access of funds and preferential bank loans.

This essay provides a comprehensive dataset using a long period focusing directly on the relationship between political connection and the cost of debt in China. Evidence is found that political connections help firms to reduce the cost of debt. It extends the current understanding of how political connections affect a firm's cost of debt under Chinese circumstances. It also contributes by separating out the board chair and the CEO's political connections and investigating their effects on the firm's cost of debt further. The findings of this essay provide a comprehensive view of the effects of the firm leadership's political connections on its cost of debt in Chinese listed firms. It also examines other key influencing factors such as government ownership, CEO duality, and leaders' personal features. This essay provides information on trading strategies for investors and institutions in the market as well as policy implications for the authorities. The findings provide

evidence and suggestions for the daily operations and long-term strategies for Chinese listed firms to reduce the cost of debt.

China is attracting increasing focus for its dramatic economic growth and, unlike most of the 'Western Economies', for its relationship-based economic characteristics. In Chinese stock markets, 40% of the listed firms have government ownership within the firm. Moreover, 39% out of all the listed firms have or once had politically connected CEOs or Board Chair or both, according to our database. Although the market perceives Chinese politically connected firms to be related to poor performance, are these firms able to find debt financing easier with a lower cost of debt? These politically connected firms are becoming important objectives in the frontiers of political economy and corporate finance.

The China Securities Regulatory Commission (CSRC) announced the Administration Regulation of Information Disclosure of Listed Companies (the Regulation) to be effective from 30th January 2007. In terms of information disclosure, the administration's regulations request not only accurate, complete, and timely reports; but also make clear which specific information should be included in the reports. For instance, those obliged to disclose information are requested to include the career information of senior executives, directors, and supervisors and their annual compensations and changes in shareholdings. Information is also requested concerning controlling shareholders and actual controllers in regular reports. These regulations are huge progress in transparency of information disclosure by Chinese listed firms. It has pushed Chinese listed firms to provide more accurate information in regular reports for investors and scholars.

Also, in 2007, the Ministry of Finance of China and CSRC announced a New Enterprise Accounting Standards System to be effective from 1st January 2007. All the listed firms are required to adjust all the year-end figures in the financial reports of 2006 and use these adjusted figures as the opening figures to prepare the financial reports of 2007. The implementation of the new accounting standards directly promoted equivalence in Chinese accounting standards towards international accounting standards. Equivalent accounting standards and financial reporting help Chinese accounting standards and financial reporting to be accepted and approved by the major countries and economies in the world; thus, they have the same effect as international accounting standards and financial reporting.

The above phenomenon and policy changes lend the opportunity to study the political economy in China and the relationship between political connections and the cost of debt in depth. This paper investigates the relationship between political connections and the cost of debt in Chinese listed firms. Following the new frontier to examine how political connections affect the cost of debt, we employ the data of all the listed firms in Chinese stock markets from 2006 to 2016 and investigate the association between political economy, leadership's political connection, government ownership, and the cost of debt. The cost of debt is the dependent variable measured by the interest expense of the firm divided by the sum of the average long-term and short-term debt (Bliss and Gul, 2012); while the main independent variables include the firm's political connections, government ownership, and CEO duality, etc. Besides, this paper includes controlling variables that are leverage, firm size, board independence, and credit rating information. The data required for the variables above are collected in China Stock Market and Accounting Research Database (CSMAR) directly where they are available. For the data that is not available in the CSMAR database

and the data of original variables measuring the firm's political connections, we manually collect these data from the firms' annual reports, the firms' official websites, and professional finance websites.

This essay contains three main parts, which are the literature review, the hypothesis and methods, and the empirical analysis. Following the empirical analysis is a brief conclusion and implications. We suggest that political connections are negatively related to the cost of debt.

2.2 Literature Review

Recently there have been many new frontiers considering the influencing factors of the cost of debt. Previously, scholars are more likely to investigate this issue from the view of the professional accounting aspect; now, people start to think there may be more important factors that affect the firm's cost of debt underlying. Politically connected firms have recently been popular objectives since the inextricable connections are revealed between political connection and corporate governance (Faccio et al., 2001; Faccio, 2006). The political connection has been a new frontier that is investigated since more and more scholars link the firm's cost of debt to its relationship-based elements. Unlike the western countries, developing countries in Asia are especially considered since it is more likely for the listed firms to achieve benefits and advantages from their political network and resources.

2.2.1 Cost of Debt and Its Influencing Factors

2.2.1.1 Political Connections and the Cost of Debt

Political connections are widely investigated in many studies since they exist in every country in the world in some manner. Firms have different kinds of political connections. They can have ex-politicians on the board or have state ownership in their ownership structure. It is believed that firms convert their political connections into their advantages and resources for the convenience to seek funds, government bailout, and favourable exceptions from regulations.

Qi et al. (2010) employed a dataset across 39 countries to find out how national-level political rights affect the cost of debt, which in their study was indicated by the yield spread of the corporate bonds. They found that political rights were negatively related to corporate bond yield spread. The results show that one standard deviation increase of political rights leads to an 18.6% decrease in the bond's yield spread. This is like the effect brought by creditor rights on the yield spread. The results also show that political institutions are replacements. In countries with weak creditor rights, the yield spread drops more for the increase of political rights. They tried to find the factor that acts as a channel through which political rights affect the cost of debt. They concluded that the freedom of the press plays an important role as a channel to reduce the risk of corporate bonds.

Yeh et al. (2013) investigated the relationship between political connections, corporate governance, and preferential bank loans. They focused on the Taiwan presidential elections in 2000 and 2004 and used them as exogenous events in their study to find out the effect of political connections on preferential bank loans and the effect of the ruling party on the types of preferential bank loans. They found a positive relationship between political connections and preferential loans from the banks, and the returns of the preferential bank loans were found to be affected by the political parties the firm stood by. Before the 2004 election, firms had higher than usual returns when they were related to the Kuomintang political party. When it comes to the corporate governance aspect, the results showed that higher quality of corporate governance is negative related to the preferential loans from the banks. This phenomenon may indicate that firms with higher quality corporate governance have more access to different financing resources. The study also found evidence that the ruling party had an influence on the types of preferential loans from the banks. However, evidence of a negative

relationship between corporate governance and preferential loans was found where firms with better corporate governance may have more sources of alternative financing.

Some other studies have focused on the influence of political connections on a firm's performance in the credit market. Infante and Piazza (2014) inspected political connections of all government levels of firms in Italy specific to the credit market. They found that firms with political connections obtained lower interest rates on the credit market when the political connections were at a local level. The results suggested that this robust evidence was even stronger where politically connected firms borrow from banks that have politicians on boards. This preferential treatment was also stronger when the autonomy level was higher for local loan officers. They provided a fresh addition to previous studies on the effect of delegated lending choices of the banks. Their findings suggest that the overall effect of political connections on interest rates is limited. But when it comes to a local situation, the effect is significantly driven by factors like the delegation of lending choice, weak law, and the bank's characteristics.

In the developing countries in South Asia, Khwaja and Mian (2005) investigated how political connections affect the lender's choice in Pakistan. They defined political connection as a director in a firm who take parts in the elections. Their study sample covered over ninety-thousand firms, and the study period was from 1996 to 2002. The results indicated that firms with political connection got 45% more loans from the bank but contributed 50% more to default rates in the market. This lending phenomenon only existed in state-owned banks. They then investigated the difference when the same firm faced varying lenders over time. The evidence indicated that firms with political connections obtained more benefits with the power growth of their

politically connected director; this finding existed no matter whether the politically connected director's party was in charge or not. And this effect decreased when the voters who supported the politically connected director took less part in the elections. They also showed results suggesting that state-owned firms have 'social motivations' to lend to firms with directors who are politically connected.

It is also believed that political connections in a firm are beneficial to gain access to the firm's financing. Claessens et al. (2008) investigated the relationship between political connections and preferential access to finance using novel indicators for political connections. They studied Brazilian firms that make contributions to elected federal deputies and measured political connections by campaign contributions. They found that politically connected firms had higher stock returns during their study period around the 1998 and 2002 elections. They observed by using fixed effects methods that politically connected firms had more bank financing after elections. This finding suggests that political connections affect firms through the channel of bank financing.

However, from another point of view, Liu et al. (2016) provided evidence that political connections do not help firms to obtain informal financing resources. They found the role of managerial and professional connections assisted firms in getting trade credit, but political connections did not. By looking specifically into non-state-owned firms, they found evidence that managers with professional connections helped firms obtain more trade credits in the situation that these firms mainly have restricted access to formal financing resources.

An important and more recent study on this issue was from Bliss and Gul (2012). Bliss and Gul (2012) looked at the relationship between political connections and the cost of debt among politically connected firms in Malaysia. Earlier studies point out that Malaysian politically connected firms are considered as having higher risk by the market and the audit firms. They further provided evidence that lenders also believed those firms had a higher risk. Their results suggest that politically connected firms have a significantly higher level of leverage. Those firms are also more likely to report a loss, have negative equity, and being audited by a large audit company. They found that CEO duality in politically connected firms is regarded to be riskier by the lenders, but more independent directors on the audit committee ease the risk. Their results suggest that politically connected firms are charged higher interest rates by lenders due to the intrinsic risks and efficient contracting.

At the beginning of their study, they indicated that Malaysia has become more and more in focus due to its feature of having politically connected firms. Firms with political connections are considered less efficient with higher risk. If a financial crisis happened in the economy, the politically connected firms would have support from the government first to get through the difficulties. However, the market has two concerns regarding those politically connected firms: first, it is widely accepted that the politically connected firms generally have poor performance from either accounting or financial aspects; second, the power and ability of the government are questioned when it comes to dealing with all those questions effectively.

Thus, the question of the government and the firms themselves give the market and the audit institutions evidence to believe that politically connected firms should have lower credit ratings.

They further analysed two corporate governance issues: CEO duality and the percentage of independent directors on board. CEO duality means that the CEO and the board chair of the firm is the same person. This will result in a situation that the firm's power is concentrated in one person's hand, which will lead to a higher risk for the firm. On the other hand, more independent directors on board will reduce the risk of the firm since it is believed that there is a positive relationship between the number of independent directors and the firm's corporate governance level. Independent directors on board will benefit the firm by providing a better financial report. Thus, these are also the key factors that the market and credit rating institutions consider when they face politically connected firms.

Then they moved on to the definition of the cost of debt. Following the limited number of studies that have focused on the cost of debt, they used examples from Pittman and Fortin (2004) and Francis et al. (2005). The cost of debt was then defined as the cost of debt financing over the whole firm. They employed the average cost of debt financing to measure the overall cost of debt as the interest payment of the averaged short-term and long-term debts. Following Johnson and Mitton (2003) and Faccio (2006), they also examined the CEO duality and board independence which was measured by the number of independent directors on board. Their main hypotheses in the studies were: first, the firm's political connection has a positive relationship with the cost of debt; second, the firm's political connection has a positive relationship with the cost of debt among the firms whose CEO and board chair are the same person; third, board independence has a negative effect on the cost of debt since it reduces the risk of the firm and improves the financial report quality which is valued by the market and credit rating institutions.

Their control group included firm age, firm size, cash flow, leverage, growth, and audit information, etc. They chose to employ a regression model to examine the dataset.

The sample included one thousand seven hundred and eighty-eight firms in which one thousand sixty hundred and sixty-seven firms were finally used in the estimation with effective data. The study period was from 2001 to 2004. In their sample description, they indicated that there were two hundred and eighty-two firms that were politically connected, which accounted for nearly 17% of the whole sample. In their sample, politically connected firms were found to be bigger and older than the other firms. Especially, they found that politically connected firms tended to have more negative equity than non-connected firms. This means that politically connected firms do have a higher risk in the market since they have a higher possibility to announce a loss. They also found that politically connected firms were mostly audited by large audit institutions, which means that their reports are more trustable than those of the other firms that reflect more accurate information.

Their results supported one of their hypotheses which was that political connection is positively related to the firm's cost of debt. The results showed that firms with political connections are requested a higher interest rate than the other non-connected firms, which indicates that the lenders and credit rating institutions do treat these politically connected firms as risky and uncertain. The effect was marked as significant at a high level with a p-value less than 0.05.

However, the results were not in line with the other two hypotheses, which expected that CEO duality would be positively related to the cost of debt

while board independence would be negatively related to the cost of debt. The finding showed that CEO duality and board independence did not have a significant relationship with the cost of debt though they are treated as incredibly important to measure the firm's risk in the market.

Then they applied two interaction terms between CEO duality, board independence, and political connection. They found that the coefficient of political connection and the coefficient of political connection by CEO duality were both significantly positive, while the coefficient of CEO duality was significantly negative. These findings indicate that CEO duality does increase the firm's risk; hence the firm is requested a higher rate of interest for borrowing. Similarly, they found that board independence is significantly negatively related to the cost of debt, which means that the lenders and credit rating institutions treat board independence to be beneficial for the firm to reduce risk.

To sum up, this study made an original contribution by providing evidence that politically connected firms in Malaysia are requested a higher interest rate for the borrowings when they use debt financing. The market and the credit rating institutions widely accept that politically connected firms carry more risks and uncertainties. Besides this, the evidence showed that politically connected firms tended to have higher leverage and a higher possibility to announce a financial loss. They also tended to have a negative impact on the firm's equity which indicates that they were more likely to suffer a loss. But politically connected firms generally had large audit institutions, which make their report more trustable. They concluded that political connection and CEO duality have a positive effect on the firm's cost of debt while board independence has a negative effect on the firm's cost of debt.

The political effect also has an impact on firms like banks. Liu and Ngo (2014) used exogenous changes around the gubernatorial elections in American to investigate the timing of bank closing. The data analysis and evidence showed that it was 45% less likely for a bank to go bankrupt in a year when the next election was approaching. They indicated the reason for this was the stability brought by political control such that the bankruptcy rate declines in the year next to elections. Especially, they found that the decline of the likelihood of bankruptcy doubled for the banks that ran in the area where the head officer dominated both the houses of the assembly when the next election was approaching.

2.2.1.2 Government Ownership, Ownership Structure and the Cost of Debt

Government ownership is another important element to be considered as political connections in a firm. Once the firm has state-ownership in its ownership structure, it is considered to have more access to the benefits provided by the government, including more access to debt and lower interest rates.

There has long been a discussion on how ownership structure affects a firm's financing situations. Ben-Nasr et al. (2015) once pointed out that firms with a controlling shareholder considering their own benefits prefer long-term debt when choosing from debt financing. This is a natural reaction since the controlling shareholder tends to maximize its interest while transferring the costs to other shareholders. Having long term debt also let the firm have less

supervision from the lenders. They employed a sample of listed firms from 1998 to 2013 to see whether the existence of more than one large shareholder makes any changes to this situation. Their findings indicated that firms with more than one large shareholder tended to have shorter debt terms, which means these large shareholders inhibit the controlling shareholder's own interest and the willingness to reduce supervisions from the lenders.

Borisova et al. (2015) investigated publicly traded firms in forty-three countries from 1991 to 2010 and investigated the influence of government ownership on the cost of debt in these firms. They found that government ownership was usually related to a higher cost of debt. But during a period of financial crises, government ownership was related to a lower cost of debt among firms that have a higher possibility of being distressed. They suggested that it was because of recessive government guarantees having a leading effect on firms during financial crises. The findings were robust to the endogeneity of government ownership, and the effects were specific to domestic government ownership.

Turning to the Chinese market, Cull et al. (2015) inspected the effect of government connections on financial constraints among Chinese listed firms. They firstly defined government connections by government ownership and interventions in CEO appointments. They found that government connections were related to less strict constraints. They also suggested that large firms with fewer government connections among non-state-owned firms were severely financially constrained, which may be because their state-owned rivals have more financial resources than. The empirical results indicate that financial conditions Chinese firms faced are largely associated with government connections and the credit misallocation by Chinese state-owned banks.

The political connection is also the influencing factor of the agency cost of debt financing. Anderson et al. (2003) focused on the ownership structure and the agency cost of debt in the firms. They investigate the influence brought by the founding family and find that founding family ownership is associated with a lower cost of debt. Their research points out that founding family ownership is prevalent in listed big firms; the existence of a founding family reduces the agency conflicts regarding equity and debt compensations. They conclude that bondholders favour founding family ownership in a firm to protect their benefits as they think founding family ownership contributes to a better structure in the firm.

Lin et al. (2011a), Lin et al. (2011b), Lin et al. (2012), and Lin et al. (2013) did a series of research studies and developed this topic in depth. In 2011, they published two research investigating the relationships among the firm's ownership structure, the cost of borrowing, and the financial constraints that the firm faces. In the first research, Lin et al. (2011a) manually collected a new dataset of firms over twenty-two countries from 1996 to 2008. From the data of these three thousand four hundred and sixty-eight firms, they find evidence that the cost of debt of a firm is heavily affected by the difference between the control right and cash flow right. The bigger the difference is, the higher the cost of debt. Then they further try to investigate the reasons behind this phenomenon. After evaluation, the finding indicates that surfeit control rights build tunnelling issues and moral hazard problems of the ultimate large controllers of the firm. These issues and potential problems lead to high credit risks and administration costs that increase the cost of the debt for the firm.

Lin et al. (2011b) then try to figure out how the difference of the ultimate controller's rights affect the financial constraints the firm faces. They employ a dataset of firms from 1994 to 2002 in the USA and investigate using GMM estimation. The results suggest that firms whose controllers have more surfeit control rights face more financial constraints than the others; this is more found in the firms which: 1, have more serious information opaque; 2, have false or inaccurate financial reports; or 3, are controlled by institutions. Evidence shows that the difference between control right and ownership leads to agency costs which, in turn, have an authentic effect on the firms financing and investing issues.

Earlier, Graham et al. (2008) did the first research regarding the relationship between misreporting and loan contracting. The evidence strongly shows that when a firm is issued a loan after its misreporting, it faces a significantly higher cost of debt, shorter terms, more likely to be asked for security, and more additional restrictions. The cost of debt is notably higher for the firms that cheating the report. The firms also pay more set-up fees and annual fees, while fewer banks or other lenders are willing to join a single loan project. This is made to reduce potential risks brought by the misreporting problems.

Then Lin et al. (2012) further study how that difference affects a firm's loan group. They employ a new dataset and find evidence that the difference between the rights that the biggest ultimate controller has heavily affect the make-up and density of the lending group of the firm's loans. When the difference between the control rights and the cash flow rights is huge, the leading organizer of the lending group builds the group with a better checking and administration structure. The lending group is usually with high density and domestic banks that are located near the firms. These banks often have experts regarding the industry that the firm belongs to. In the end,

they also investigate the relationship between the firm's structure and the lending group's structure.

Lin et al. (2013) finally estimated how a firm's ownership structure affect its pick among different debt financing. They employed a new sample that contains over nine thousand firms in twenty countries and the study period is from 2001 to 2010. The results suggest that the difference of rights that the biggest ultimate controller has negatively affects the firm's dependence on debt from the bank. The control and cash flow rights of the ultimate controller also affect the debt's lending period and security. They also indicated that firms with big ultimate controllers who have surfeit rights preferred public financing to bank financing to have less investigation and supervision from the banks.

2.2.1.3 Other Influencing Factors of the Cost of Debt

Firstly, information is an important element in debt financing. Easley and O'hara (2004) investigated the aspect of information and the cost of capital. They found that investors require higher returns for stocks with more private information when both public and private information were taken into consideration. They concluded that investors could manage their investment portfolios based on the information they hold while other investors with no access to this information are worse off. Similarly, the quantity and quality of the information are also the influencing factors of the cost of capital. Their research showed that firms could affect the cost of capital using measures such as accounting method, analyst reports, and market microstructure method.

Huang et al. (2016) focused on the cost of debt in the firms in their initial public offering. They employ a dataset of the initial public offering firms for the period 1992 to 2011. They try to find out how private equity firms play behind those initial listed firms' cost of debt. Their results suggest that the corporate bond's yield spread is lower by seventy base points among the firms that are part of a private equity firm's portfolio with other conditions unchanged. They also point out that firms with private equity investment have more prudent investment and dividend policy compared with firms without private equity investment after the issue of corporate bonds. They conclude that private equity firms help firms within their portfolios to lower the cost of debt due to their reputational concerns.

Apart from information, IPO, and government policies, regulation change is also a key factor in the cost of debt in the firms. Kisgen and Strahan (2010) studied the changes after the US Securities and Exchange Commission endorsed a 4th credit rating agency in 2003. This officially endorsed agency (Dominion Bond Rating Service, DBRS) is made for bond investment regulations. They observe that DBRS's rating implies the changes of bond yield spreads other than other endorsed rating agencies. With one-level higher rating given by DBRS results in a 39 base-point lower cost of capital of a firm. The phenomenon is more evident in bonds that are rated around the cut-off points of investment level. They point out that the yield spreads are driven when the bond has a better DBRS rating. The regulations and rating systems on bonds have an influence on the cost of debt of a firm.

Political connections sometimes can be a specific distance on the map. Bradley et al. (2016) investigated the effect of political connections on the cost of debt from the aspect of political geography. They measure policy risk

by the political power shown by the location of the firm in the country's political map. They find that the location of the firm in the political map has a positive relationship with the cost of debt. After using the difference-in-difference method, they find evidence that firms that are more aligned with the president face more policy risks and higher yield spreads. Their findings also suggest that policy risks have less effect on the firm's cost of debt when the firm contributes more to the Political Action Committee or lobbying.

2.2.2 Studies of the Chinese Case

More recently, Wang (2015) examined the role of politically connected independent directors in Chinese listed firms. He studied the period from 2003 to 2012 using a sample of the Shanghai stock exchange with seven thousand four hundred and eighty-seven observations. After classifying the firms into private firms and state-owned firms, he finds evidence that the impact of politically connected independent directors is shaped by the firm's ownership structure. Firms with more politically connected independent directors perform better than their opposition parties. He suggests that it is because those firms have more resources in debt financing and government treatments. In addition, he finds that politically connected independent directors increase the number of related-party transactions with the controller of the firm among private firms. But politically connected independent directors do not have an effect on the value-adding of state-owned firms. This phenomenon is especially found in firms controlled by the local government.

In the banking area, Qian et al. (2015) investigated the relationship between political connection and the bank's prudential behaviour in a sample of

Chinese City Commercial Banks. They pointed out the phenomenon of officials-and-directors who were directors of banks appointed by the government. They investigated a sample of Chinese City Commercial Banks from 2006 to 2010 and looked at the relationship between officials-and-directors and the bank's prudential behaviour. Their results showed that banks with officials-and-directors had lower prudential behaviour than the others; this effect is more significant when the officials-and-directors had a higher administrative level or older age. They further examined the effect brought by the independent directors and female directors. Their findings showed that independent directors significantly reduced the effect of the officials-and-directors, while female directors increased the bank's prudential behaviour without officials-and-directors.

2.2.3 Conclusion

Based on the literature review above, we confirmed that political connection is increasingly important as the influencing factor of the cost of debt. In many cases, the political connection is beneficial to the firms since it can bring advantages during financing progress. In other cases, the political connection is also a key reason that the firm can obtain government bailouts and regulation exceptions. However, there are also scholars who indicate that political connection has no effect on the firm's cost of debt. This happens when scholars employ even the same definition of the political connection but apply them in different countries and economies.

Thus, we find that the current literature is limited on this issue; and that the relationship between political connection and the cost of debt in China is not widely mentioned. Some studies investigate the political connections in

Chinese listed firms, but they ignore their effect on the cost of debt. While other studies try to investigate the cost of debt, but they focus more on the access of funds and preferential bank loans. This essay provides a comprehensive dataset of a long period focusing directly on the relationship between political connection and the cost of debt in China. It extends the current understanding of how political connections affect a firm's cost of debt under Chinese circumstances. It also contributes by dividing the board chair and the CEO's political connection and investigating their effects on the firm's cost of debt further.

This essay will build hypotheses according to the literature review and aim to provide a comprehensive view of the effects of political connections of the leaders on the firm's cost of debt in Chinese listed firms. It will examine other key influencing factors such as government ownership, CEO duality, and the leader's personal features, etc. This essay will provide information for trading strategies of investors and institutions in the market as well as policy implications for the authorities. The findings aim to provide evidence and suggestions for the daily operations and long-term strategies for Chinese listed firms to reduce the cost of debt.

2.3 Hypotheses, Data and Methodology

2.3.1 Background and Hypotheses

2.3.1.1 Background of Chinese Political Connections and the Cost of Debt

At the early age of the Chinese economy, the economic system is known as the 'Planned Economy'. In that stage, all the business and economic activities are controlled by the government in a 'planned' development footpath. Thus, China has a tradition that the government controls all the resources and allocate them to different economic units.

After a time of development, China experienced a transformation of the economy and the economic system turned into a 'Market Economy'. Private sectors are rising in nearly every industry except for some special areas such as the Oil industry, Military industry, and other state-controlled areas. The economy was still highly boosted and developed at high speed for thirty years to benefit from the vitality and stimulation brought by the private economy. The importance of the private sector cannot be neglected.

However, the influence of the government regarding the economic system is not weakened. Under the specific economic atmosphere in China, many resources are still controlled by the state. The old state-owned firms, whether they are listed or not, have grown into giant enterprises in society. While we also have superb successful private-owned firms that count for 79.4% of the entire number of firms in the economy, according to the National Bureau of Statistics*.

* *Economic and Social Development Achievement Report for the 70th Anniversary of the Founding of New China*, a report published by the National Bureau of Statistics of China, 26th August 2019.

While we jump into the new century, the political connection of a firm is considered more to be the political connections of the leadership. In the Chinese stock exchanges, we find that 40% of the listed firms have government ownership, while 39% of the firms have or once had politically connected top managers. This indicates that listed firms in the Chinese market prefer political connection as the political connection is widely accepted to be beneficial to the development of the firms.

Political connection in this essay is defined as whether the leaders of the firms are politically connected. We define leaders in a firm as the CEO and the board chair in the firm who are the key decision-makers normally. Following Ma et al. (2013), we consider the top managers to be politically connected if either he or she is a current or ex-government official at all levels or a current or ex-member of National People's Congress (NPC), or a current or ex-member of Chinese People's Political Consultative Conference (CPPCC), or a current or ex-member of the military department with equivalent government official levels. These politically connected leaders are sometimes directly appointed by the government or switching from their previous government position. In other ways, these leaders take the position of the CEO or board chair from their own wills after their political post. In a few cases, the political connection of the leaders occurred at an early stage of their career history, but they may be able to keep the connection in their personal network afterwards.

We can take the firm State Development and Investment Corp. (SDIC) Zhonglu Fruit Juice Co., Ltd as an example to show the leader's political connections. SDIC Zhonglu Fruit Juice Co., Ltd is trading in Chinese stock markets with the stock number 600962. Its main business is to make juices, and its business address locates in Beijing, China. Below is a table showing

all the CEO and board chair turnover during our research period from 2006 to 2016:

Table 2-1 Political Connections of the Leaders of 600962: SDIC Zhonglu Fruit Juice Co., Ltd

Board Chair	Background and Political Connection
Li Junxi	Male, 1965, Bachelor's degree
	Ministry of Transport Finance Bureau
Hao Jian	Male, 1961, Master's degree
	SDIC, government official level 7
Zhou Licheng	Male, 1962, Master's degree
	Ministry of Textile Industry
Liu Xueli	Male, 1955, Master's degree
	Ministry of Light Industry

CEO	Background and Political Connection
Zhang Jiming	Male, 1968, Bachelor's degree
	No political connection in career history
Zhang Jian	Male, 1962, Bachelor's degree
	Ministry of Agriculture
Hao Jian	Male, 1961, Master's degree
	SDIC, government official level 7
Pang Jiaqing	Male, 1962, Bachelor's degree
	No political connection in career history
Liu Xueli	Male, 1955, Master's degree
	Ministry of Light Industry
Li Yusong	Male, 1958, Bachelor's degree
	Ministry of Agriculture

From the table, we can observe that all the board chair in this firm have political connections in their career history. While among their CEOs, only two out of all the CEOs do not have political connections in their career history, which may be because they are promoted from within the firm or they are professional managers.

If we look at the average cost of debt of SDIC Zhonglu Fruit Juice Co., Ltd, we can get the figure below:

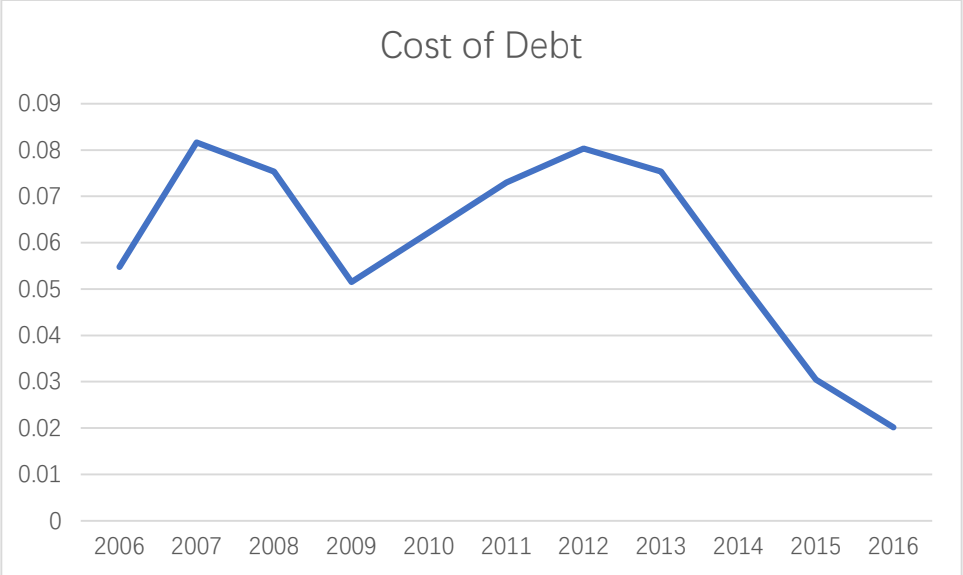


Figure 2-1 Cost of Debt of 600962: SDIC Zhonglu Fruit Juice Co., Ltd

The above figure shows that the overall cost of debt of SDIC Zhonglu Fruit Juice Co., Ltd keeps at a low level over the research period. The highest cost of debt reaches around 8.17% in 2008; this may be due to the economic environment in 2008 when the world experienced a global financial crisis. After the year 2008, the cost of debt experienced a short period of fluctuation between 8% and 5% and then showed a clear downward trend. The lowest cost of debt of this firm is as low as 2.01%, but in the same period, the

general interest rates are around 10% for normal business.

Thus, political connections put firms in an advantaged place when seeking funds and discuss the interest payment. As we mentioned above, certain financial resources and appropriations are controlled by the government; political connections are considered as a powerful endorsement for credit in the Chinese banking system, and politically connected firms can convert their political connection via personal network or other channels to seek benefits either for its reputation or practical benefits like lower interest rates. Chinese listed firms are eager to be politically connected in the market.

2.3.1.2 Hypotheses

According to the literature review and the background analysed above, we aim to find out the relation between political connections and the cost of debt in Chinese listed firms. Below are the main hypotheses.

Firstly, we expect that political connections are negatively related to the cost of debt. Scholars have mentioned that political rights and political connections help the firm reduce the cost of debt in the credit market and obtain more preferential loans (Qi et al., 2010; Yeh et al., 2013; Infante and Piazza, 2014; Khwaja and Mian, 2005; and Claessens et al., 2008). Political connections are also shown to bring benefits like lower interest rates (Infante and Piazza, 2014), lower tax rates (Faccio, 2010), more chance to obtain a government bailout (Faccio, 2006), preferential bank loans (Yeh et al., 2013; Khwaja and Mian, 2005; Firth et al., 2009; Sapienza, 2004), easier access to external financing (Claessens et al., 2008; Boubakri et al., 2012a; Boubakri

et al., 2012b; Johnson and Mitton, 2003; Hearn, 2012), and potential financial or regulatory treatment from authorities (Faccio et al., 2006; Johnson and Mitton, 2003; Bunkanwanicha and Wiwattanakantang, 2009). The political connection is treated as a boost of the firm for the following reasons. First, political connection helps the firm obtain financial support during crises or difficulties as we know that China has financial appropriations to the government-related firms and other firms when they are in need. During the crisis, politically connected firms are in priority to be rescued and feed. Second, during the normal economic period, politically connected firms are believed to have more access to funds or obtain preferential interest rates when they seek funds. The Chinese banking system is market-based; however, political connections are considered a powerful endorsement for credit. Finally, politically connected firms can convert their political connection via personal networks or other channels to seek benefits either for their reputation or practical benefits, like, lower interest rates. The political connections of the leaders are converted to the convenience of obtaining a lower interest rate in many ways. If the leaders are current government officials appointed as the firm's managers, they may have the position convenience to obtain low-interest loans from the government. If the leaders are former government officials, they can still use the relationship-based network to obtain a low interest rate. The benefit of political connections is an aggregate of the system advantage they build when working in different social sectors and the information advantage they obtain when working as government officials. The information advantage lasts though they no longer work in the government.

Hence, for the relationship between political connections and the cost of debt, we have:

H1. There is a negative relationship between the overall political connection of the leaders and the cost of debt.

Additionally, this essay will segment the overall political connection of the leaders into the board chair's political connection and the CEO's political connection. As we earlier mentioned in the literature review, Fan et al. (2007) defined the CEO as the determining executive; however, Chen et al. (2006) and Kato and Long (2006) defined the board chair as the determining executive since the board chair is also engaged in daily operations widely among Chinese listed firms as we know that the board chair is the legal representative of the firm according to China's Corporate Law. Kato and Long (2006) further suggested that the board chair is more powerful than the CEO, even if they are both engaged in the firm's daily operations. They give an example to explain the phenomenon: in China, it is deemed as a promotion if someone is assigned as the board chair in the listed SOEs, but it is deemed as a demotion if someone is assigned as the CEO from the position of the board chair. In this way, we can discover who has more effect on the firm regarding the political connection and the cost of debt.

Hence, we have the next two hypotheses:

H2. There is a negative relationship between the board chair's political connection and the cost of debt.

H3. There is a negative relationship between the CEO's political connection and the cost of debt.

We will also investigate government ownership as a key influencing factor in the firm's cost of debt. As discussed by Borisova et al. (2015), Cull et al. (2015), and Anderson et al. (2003), etc., firms with government ownership have benefits under certain circumstances. Unlike firms in developed countries, Chinese listed firms have a higher proportion of State-owned firms (SOEs). In this essay, we define a firm as an SOE if the ownership structure shows the firm is ultimately owned by the state. In the first essay, we focus on the relationship between political connections and firm performance; we include the general political connection, the board chair's political connection, the CEO's political connection, and their personal features since these are dynamic influencing factors of the firm performance. We did not include state ownership in essay one is because a firm's nature (ultimately owned by the state or not) can hardly decide its performance and the trend thereafter. However, in this essay, we turn our attention to how political connection affects a firm's cost of debt. In this case, a firm's nature might then affect the lender's choice under Chinese circumstances. Regarding government ownership, we expect that:

H4. There is a negative relationship between government ownership and the cost of debt.

Overall, we expect political connections have a negative effect on the firm's cost of debt. When a firm is politically connected, it is more likely that it can have a lower cost of debt when it tries to use debt financing. We also expect that CEO duality has a negative effect on the cost of debt. Male leaders and senior leaders increase the firm's cost of debt.

2.3.2 Data and Sample

2.3.2.1 Sample Description and Variable Definition

The sample of this paper contains the entire listed firms in China except for those in the Finance section. Since it is widely accepted that financial firms normally have abnormal leverage and cost of debt. The cost of debt in financial firms does not reflect the conventional definition and theories. The research period of this essay is eleven years, from 2006 to 2016. In this sample, we have 3,222 Chinese listed firms and 25,572 observations in total. The sample and dataset are unbalanced since there are firms initially listed or delisted during the research period that the data is not available.

Below is a table showing the observations and the percentage of politically connected firms in each observation year:

Table 2-2 Number of Observations and the Percentage of Politically Connected Firms in Each Year

Year	Number of Firms	Number of Politically Connected Firms	Proportion
2016	1710	677	39.01%
2015	2785	1124	40.36%
2014	2599	1083	41.67%
2013	2484	1051	42.31%
2012	2440	1087	44.55%
2011	2312	1036	44.81%
2010	2080	953	45.82%
2009	1731	817	47.20%
2008	1584	757	47.80%
2007	1530	737	48.17%
2006	1424	665	46.70%
Total	22,679	9,987	44.04%

From the table above, we observe that the percentage of firms with political connection is over 40% every year except for the year 2016, which is 39.01%. As the statistics of the main variable, the figure shows that Chinese stock markets have a high level of politically connected firms.

For instance, in 2016, we have one thousand seven hundred and ten listed firms in total in the market except for the firms in the financial sector. Among these firms, we have six hundred and seventy-seven firms that are politically connected, which means either their CEO or the board chair or both are politically connected. If we use 677 politically connected firms divided by the total number of firms 1710, we have the percentage of the politically connected firms of the year 2016 is 39.01%.

In this essay, we employ the cost of debt as the dependent variable, and we use a ratio to measure the cost of debt, which is:

$$\text{Cost of Debt} = \frac{\text{Interest Expense}}{\text{Average Short Term Debt} + \text{Average Long Term Debt}}$$

*Interest Expense includes the interest expenses for both short-term and long-term debt.

The independent variables contain two groups: the main characteristic group and the controlling group. In the characteristic group, we have: first, political connections of the leaders in the listed firm (either/both the board chair and the CEO); second, government ownership of the listed firms; third, the gender of the leaders; fourth, the age of the leaders, and fifth, CEO duality. In the controlling group, we have leverage, firm size, board independence, and credit rating information. The details of these variables are shown in the table below:

Table 2-3 Definition of Variables

	Variable Name	Definition/Measurement
Dependent Variable	Cost of Debt (COD)	Cost of Debt is measured by the interest expense ratio that equals the interest expense divided by the average sum of short-term and long-term debts. The interest expense contains both short-term and long-term interest expenses.
Main Variables	Political Connection (PC/BPC/CPC)	Dummy variable that equals one if either or both the board chair and the CEO are: 1) current or ex-government officials or military officers; 2) current or ex-members of NPC or CPPCC; and zero otherwise.
	Government Ownership (DUM)	Dummy variable that equals one if the firm is controlled by the state; and zero otherwise.
Main Variables	Gender (BGEN/CGEN)	Dummy variable that equals one if the board chair/CEO is male; and zero otherwise.
	Age (BAGE/CAGE)	The board chair/CEO's age.
	Duality (DUA)	Dummy variable that equals one if the board chair and the CEO is the same person; and zero otherwise.
Control Variables	Leverage (LEV)	The total liabilities divided by the total assets of the firm.
	Firm Size (SIZE)	Natural logarithm of the total assets.
	Board Independence (BI)	The number of independent directors on the board.
	Credit Rating (TOP)	Dummy variable that equals one if the firm's auditing firm is among the 'Big Four'*; and zero otherwise. *The 'Big Four' refers to the biggest four professional audit firms in China, which are PwC, DTT, KPMG, and EY based on their turnover by the year 2017.

Then we prepare the data for the empirical analysis. We employ STATA software and run the descriptive statistics first; then, we check the correlation coefficient to ensure there is no significant relationship between the variables.

Table 2-4 Statistics of the Variables

Variables	Observations	Mean	Std. Dev.	Min	Max
Cost of Debt	19,958	0.02413	0.15174	-0.50376	0.21559
Board Chair's Age	22,410	51.05310	7.14806	21	84
CEO's Age	22,354	47.53914	6.49095	21	78
Leverage	22,676	0.46541	0.24058	0.04635	1.39855
Size	22,676	21.78469	1.30679	18.8260	25.7051
Board Independence	22,534	3.24337	0.64881	0	8

From the table above, we can observe the observations of the variables. The dataset contains all the Chinese listed firms except for the firms in the Finance sector. The stock code ranges from 000001 to 900957. The table shows the statistics of the variables with their number of observations, the value of the mean, the value of the standard deviation, the minimum value of the variable, and the maximum value of the variables. For example, among the observations, the youngest board chair is 21 years old, while the oldest board chair is 84 years old. For the board independence in each firm, the minimum number of independent directors on board is zero, while the maximum number of independent directors on board is 8.

Further, to show the statistics of the dummy variables, we make the table below year by year:

Table 2-5 Statistics of the Board Chair's Political Connection and the CEO's Political Connection

Year	Number of Firms	Number of Politically Connected Board Chair	Proportion	Number of Politically Connected CEO	Proportion
2016	1710	615	35.96%	324	18.95%
2015	2785	1005	36.09%	566	20.32%
2014	2599	967	37.21%	534	20.55%
2013	2484	941	37.88%	510	20.53%
2012	2440	967	39.63%	528	21.64%
2011	2312	925	40.01%	506	21.89%
2010	2080	850	40.87%	451	21.68%
2009	1731	726	41.94%	373	21.55%
2008	1584	661	41.73%	338	21.34%
2007	1530	639	41.76%	342	22.35%
2006	1424	571	40.10%	317	22.26%
Total	22,679	8,867	39.10%	4789	21.12%

From the table above, we can observe that 39.10% of the firms have or once had a politically connected board chair, and 21.12% of the firms have or once had politically connected CEOs. The percentage of the politically connected board chair is overall larger than the politically connected CEO. This also shows a tradition in China that the board chair normally has more power than the CEO. The highest percentage of politically connected board chair is 41.94%, while the highest percentage of politically connected CEO is 22.35%. The lowest percentage of politically connected board chair is 35.96%, while the lowest percentage of politically connected CEO is 18.95%.

Regarding the rest dummy variables, we have a brief table below that shows the summary statistics of government ownership, CEO duality, and the credit rating information:

Table 2-6 Brief Summary Statistics of Dummy Variables

	Number of Observations that have/are	**Percentage of the Entire Observations**
Controlled by Government Ownership	10,541	41.22%
CEO Duality	5,049	19.74%
Audited by Big Four	1,269	4.96%
Male Board Chair	22,832	92.50%
Male CEO	22,438	94.93%

From this table, we can observe that 41% of the firms are controlled by government ownership in our sample. Among all the listed firms, 19.74% of the firms have their board chair and CEO as the same person, which means that the power in the firms is concentrated. While only 4.96% of the firms are audited by the Big Four audit firms, which means they have a high quality of financial reports. Regarding the gender of the leaders in the firms, we can observe that the majority of the leaders in Chinese listed firms are male. They act as 92.50% of the firms' board chair and 94.93% of the firms' CEO, respectively.

Based on the tables and analyses above, we have had a comprehensive observation of all the variables we have in the dataset. The correlation coefficient results also show that there is no significant relationship between the variables. The related table of the correlation coefficient is attached in the Appendix.

2.3.2.2 Data Description

According to the discussion above, we mainly have two data sources: the first is the CSMAR database, and the second is manually collected by ourselves. CSMAR database's full name is China Stock Market and Accounting Research. We find most of the data we need directly from the database, including the financial ratios, balance sheet, and part of the personal characteristics information. Where the data is not available directly in CSMAR, we manually collect them from the listed firm's financial reports, annual reviews, and other professional financial data websites, including Bloomberg.com, Yahoo Finance, and Finance iFeng, etc. We manually collect all the data of the political connection variables and part of the missing data in the CSMAR database. Some data is missing because it is not compulsory for the firms to announce the information required by the China Securities Regulatory Commission.

2.3.3 Methodology and Models

Based on the literature review in part two, we have discussed the studies by other scholars globally and the methods they use. They mainly use three methodologies which are cross-sectional methodology, time-series methodology, and panel data methodology, in their studies.

The shortcoming of the cross-sectional methodology is that it is for a certain period of the data. It does not show the results of the dataset in the long run that we do not have a comprehensive view of the research question. Time-series methodology is also not the best for this essay because it shows more

about the time effect of the results. Besides, time-series methodology usually requires a large sample with a long research period. It is more like an aggregate of many cross-sectional estimates.

This essay is going to apply panel data methodology since it has both the advantage of cross-sectional methodology and time-series methodology. It not only shows the causal relationship between the variables, but it also shows the impact along time. Based on the panel data methodology, we can then write down the models for hypotheses **H1** to **H4** below:

Models:

$$\mathrm{COD_{it}} = \beta_1 + \beta_2 \mathrm{PC_{it}} + \beta_3 \mathrm{DUM_{it}} + \beta_4 \mathrm{DUA_{it}} + \beta_5 \mathrm{LEV_{it}} + \beta_6 \mathrm{SIZE_{it}} + \beta_7 \mathrm{BI_{it}} + \beta_8 \mathrm{TOP_{it}} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [1]$$

$$\mathrm{COD_{it}} = \beta_1 + \beta_2 \mathrm{BPC_{it}} + \beta_3 \mathrm{BGEN_{it}} + \beta_4 \mathrm{BAGE_{it}} + \beta_5 \mathrm{DUM_{it}} + \beta_6 \mathrm{DUA_{it}} + \beta_7 \mathrm{LEV_{it}} + \beta_8 \mathrm{SIZE_{it}} + \beta_9 \mathrm{BI_{it}} + \beta_{10} \mathrm{TOP_{it}} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [2]$$

$$\mathrm{COD_{it}} = \beta_1 + \beta_2 \mathrm{CPC_{it}} + \beta_3 \mathrm{CGEN_{it}} + \beta_4 \mathrm{CAGE_{it}} + \beta_5 \mathrm{DUM_{it}} + \beta_6 \mathrm{DUA_{it}} + \beta_7 \mathrm{LEV_{it}} + \beta_8 \mathrm{SIZE_{it}} + \beta_9 \mathrm{BI_{it}} + \beta_{10} \mathrm{TOP_{it}} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [3]$$

In the equations above, COD refers to the cost of debt measured by the ratio that equals interest expense divided by the average sum of short-term and long-term debt. PC, BPC, CPC refer to the overall political connection, the board chair's political connection, and the CEO's political connection,

respectively. DUM refers to government ownership which equals one if the firm is controlled by government ownership and zeroes otherwise. DUA refers to the CEO duality, which equals one if the CEO and the board chair are the same person and zero otherwise. BGEN/BAGE stands for the gender and age of the board chair, while CGEN/CAGE stands for the gender and age of the CEO. Hence these are the matrixes of the factors affecting the cost of debt of a listed firm.

LEV, SIZE, BI, and TOP belong to the control group. They stand for the leverage, firm size, board independence, and credit rating variables. Besides, β_1 is the intercept and ε_{it} is the disturbance term. μ_i is for the time-invariant effects that make an individual different from the others.

2.4 Empirical Results

2.4.1 Data Process

During the empirical process, we are going to employ STATA software to run each test and estimations. For the first step, we set up the dataset as a panel dataset by using the STATA code: xtset id year (where 'id' stands for the stock code and 'year' stands for the observation year).

We are shown that the dataset is an unbalanced dataset from 2006 to 2016. This is because firms will be doing listing and delisting every year. The sample has some new firms to join and part of the current firms to leave each year, so the history and data for each firm are unbalanced over time.

We then run the Ordinary Lease Squares (OLS) regression followed by the Estimation of the Random Effects for all three equations:

Table 2-7 OLS Regression Results for All Equations

VARIABLES	Equation [1] Cost of Debt	Equation [2] Cost of Debt	Equation [3] Cost of Debt
Political Connection	0.000470		
	(0.00129)		
Board Chair's Political Connection		-0.000140	
		(0.000801)	
Board Chair's Gender		0.00264	
		(0.00198)	
Board Chair's Age		0.0000113	
		(5.66e-05)	
CEO's Political Connection			-0.00345***
			(0.000974)

VARIABLES	Equation [1] Cost of Debt	Equation [2] Cost of Debt	Equation [3] Cost of Debt
CEO's Gender			0.000548
			(0.00178)
CEO's Age			8.04e-05
			(6.27e-05)
Government Ownership	-0.00769***	-0.00440***	-0.00446***
	(0.00139)	(0.000851)	(0.000860)
CEO Duality	0.00328**	0.0000378	-0.000413
	(0.00165)	(0.00101)	(0.00105)
Leverage	0.0988***	0.0405***	0.0400***
	(0.00303)	(0.00189)	(0.00188)
Size	-0.00390***	-0.00570***	-0.00569***
	(0.000559)	(0.000345)	(0.000344)
Board Independence	-0.000567	-0.000857	-0.000833
	(0.00100)	(0.000611)	(0.000612)
Credit Rating Information	-0.00216	0.00738***	0.00747***
	(0.00291)	(0.00180)	(0.00180)
Constant	0.0994***	0.182***	0.183***
	(0.0118)	(0.00758)	(0.00770)
Observations	16,635	16,036	16,017
R-squared	0.062	0.043	0.043

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2-8 Random Effects Estimation Results for All Equations

VARIABLES	Equation [1] Cost of Debt	Equation [2] Cost of Debt	Equation [3] Cost of Debt
Political Connection	-0.00252		
	(0.00173)		
Board Chair's Political Connection		-0.00142	
		(0.00178)	
Board Chair's Gender		0.00483	
		(0.00405)	

VARIABLES	Equation [1] Cost of Debt	Equation [2] Cost of Debt	Equation [3] Cost of Debt
Board Chair's Age		0.000281**	
		(0.000113)	
CEO's Political Connection			-0.00668***
			(0.00199)
CEO's Gender			0.00536
			(0.00334)
CEO's Age			0.000267**
			(0.000114)
Government Ownership	-0.00375	-0.00364	-0.00428*
	(0.00255)	(0.00256)	(0.00255)
CEO Duality	0.000384	-0.000425	-0.000133
	(0.00185)	(0.00185)	(0.00191)
Leverage	0.0989***	0.0994***	0.0986***
	(0.00378)	(0.00378)	(0.00379)
Size	0.00153**	0.00124*	0.00111
	(0.000733)	(0.000750)	(0.000749)
Board Independence	-0.00122	-0.00108	-0.00123
	(0.00127)	(0.00127)	(0.00127)
Credit Rating Information	-0.0102**	-0.0104**	-0.00792*
	(0.00447)	(0.00448)	(0.00447)
Constant	-0.0204	-0.0331*	-0.0276
	(0.0163)	(0.0169)	(0.0168)
Observations	16,635	16,609	16,590
Number of id	2,560	2,558	2,557

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From the results above, we observe different effects and significances regarding the relationship between the variables. The OLS estimation shows that the overall political connection is positively related to the cost of debt, while the board chair's political connection and the CEO's political connection have a negative effect on the cost of debt, as expected. However, only the impact of the CEO's political connection is significant at a three-

star level. This indicates that the CEO's political connection can help firms significantly reduce the cost of debt financing. For all the equations, government ownership has a significant negative relationship with the cost of debt which means that firms with government ownership have lower interest expense of debt. In each equation, CEO duality has a positive relationship with the cost of debt, but the effect is only significant in Equation [1]. As to the control group, we find that leverage and credit rating have a positive impact on the cost of debt, in which the impact of credit rating is significant at the highest level. The results also show that firm size and board independence are negatively related to the cost of debt, which means that a smaller size helps the firm to reduce the cost of debt.

The estimation of the random effects shows the different suggestions. In the table, we can observe that the overall political connection, the board chair's political connection, and the CEO's political connection all have a negative effect on the cost of debt as well as expected. In which the impact of the CEO's political connection is significant at a 1% level. The effect brought by government ownership is also negative. The difference is that the estimation of the random effects shows that CEO duality has a positive effect on the cost of debt in Equation [1] but negative effects in Equation [2] and [3]. And for the control group, it shows board independence and credit rating have a negative relationship with the cost of debt. While leverage and size both have a positive effect on the cost of debt.

To find out which one is more suitable for the research question, we run a Breusch and Pagan Test to choose between the OLS estimation and the Estimation of the Random Effects.

Table 2-9 Breusch and Pagan Test for Equation [1]

Breusch and Pagan Lagrangian Multiplier Test for Random effects		
cod[id,t] = Xb + u[id] + e[id,t]		
Estimated results:		
	Var	sd = sqrt(Var)
cod	0.007163	0.084637
e	0.00386	0.062133
u	0.006658	0.081594
Test: Var(u) = 0		
	chibar2(01) =	2708.42
	Prob > chibar2 =	0.0000

Table 2-10 Breusch and Pagan Test for Equation [2]

Breusch and Pagan Lagrangian Multiplier Test for Random effects		
cod[id,t] = Xb + u[id] + e[id,t]		
Estimated results:		
	Var	sd = sqrt(Var)
cod	0.007169	0.084668
e	0.003844	0.062
u	0.006762	0.082229
Test: Var(u) = 0		
	chibar2(01) =	2702.82
	Prob > chibar2 =	0.0000

Table 2-11 Breusch and Pagan Test for Equation [3]

Breusch and Pagan Lagrangian Multiplier Test for Random effects		
cod[id,t] = Xb + u[id] + e[id,t]		
Estimated results:		
	Var	sd = sqrt(Var)
cod	0.007156	0.084591
e	0.003849	0.062044
u	0.006674	0.081691
Test: Var(u) = 0		
	chibar2(01) =	2702.47
	Prob > chibar2 =	0.0000

From the test results, we can observe that all the values of Prob > chibar2 equal to zero. The results indicate that they reject the null hypothesis of no random effects; hence the OLS estimations would have been inefficient. The test results suggest preferring the Estimation of the Random Effects.

We then move on to test between the Estimation of the Random Effects and the Estimation of the Fixed Effects employing the Hausman Test to find out which one is most suitable for the estimation. Below we have the test results for the Hausman Test for each equation:

Table 2-12 Hausman Test Results for Equation [1]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
pc	-0.0042	-0.00252	-0.00167	0.000895
dum	0.000653	-0.00375	0.004404	0.002429
cco	-0.0004	0.000384	-0.00078	0.000772
lev	0.088789	0.09894	-0.01015	0.00185
size	0.002458	0.001528	0.00093	0.000395
bi	-0.00104	-0.00122	0.000178	0.000571
top4	-0.01011	-0.01019	7.65E-05	0.002821

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 49.03

Prob>chi2 = 0.0000

Table 2-13 Hausman Test Results for Equation [2]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
bpc	-0.00366	-0.00142	-0.00224	0.000936
dum	0.000668	-0.00364	0.00431	0.002412
bgen	0.00552	0.004831	0.000689	0.001918

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
bage	0.000405	0.000281	0.000124	5.17E-05
cco	-0.00158	-0.00042	-0.00115	0.000765
lev	0.088936	0.099381	-0.01044	0.001833
size	0.001999	0.001236	0.000763	0.00041
bi	-0.00085	-0.00108	0.000224	0.000569
top4	-0.01020	-0.01038	0.000175	0.002811

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 57.66

Prob>chi2 = 0.0000

Table 2-14 Hausman Test Results for Equation [3]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
cpc	-0.00863	-0.00668	-0.00194	0.00093
dum	-2E-05	-0.00428	0.00426	0.00243
cgen	0.005852	0.005356	0.000496	0.001448
cage	0.000282	0.000267	0.000015	4.49E-05
cco	-0.00139	-0.00013	-0.00126	0.000791
lev	0.088313	0.09864	-0.01033	0.001855
size	0.001999	0.001111	0.000887	0.000409

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
bi	-0.00106	-0.00123	0.000171	0.00057
top4	-0.00717	-0.00792	0.000745	0.002825

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 50.46

Prob>chi2 = 0.0000

From the Hausman Test results above, we observe that the results all have a Prob>chi2 value equal to zero, which reject the null hypothesis. The results reject the random effects model and suggest the fixed effects model. Hence, we are going to use the results from the fixed effects models to run the estimations.

2.4.2 Empirical Results

The fixed effects model is preferred. Below is the result for all equations:

Table 2-15 Fixed Effects Estimation Results for All Equations

VARIABLES	Equation [1] Cost of Debt	Equation [2] Cost of Debt	Equation [3] Cost of Debt
Political Connection	-0.00420**		
	(0.00194)		
Board Chair's Political Connection		-0.00366*	
		(0.00201)	
Board Chair's Gender		0.00552	
		(0.00448)	
Board Chair's Age		0.000405***	
		(0.000124)	
CEO's Political Connection			-0.00863***
			(0.00220)
CEO's Gender			0.00585
			(0.00364)
CEO's Age			0.000282**
			(0.000123)
Government Ownership	-0.000653	-0.000668	-0.000195
	(0.00352)	(0.00351)	(0.00353)
CEO Duality	-0.000396	-0.00158	-0.00139
	(0.00200)	(0.00200)	(0.00206)
Leverage	0.0888***	0.0889***	0.0883***
	(0.00421)	(0.00420)	(0.00422)
Size	0.00246***	0.00200**	0.00200**
	(0.000832)	(0.000855)	(0.000853)
Board Independence	-0.00104	-0.000851	-0.00106
	(0.00139)	(0.00140)	(0.00139)
Credit Rating Information	-0.0101*	-0.0102*	-0.00717
	(0.00528)	(0.00529)	(0.00529)

VARIABLES	Equation [1] Cost of Debt	Equation [2] Cost of Debt	Equation [3] Cost of Debt
Constant	-0.0283	-0.0432**	-0.0349*
	(0.0193)	(0.0198)	(0.0197)
Observations	16,635	16,609	16,590
R-squared	0.049	0.049	0.050
Number of id	2,560	2,558	2,557

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

According to the results above, we can then re-write the three equations obtained from part three:

$$\begin{aligned}\mathrm{COD_{it}} = {} & -0.0283 - 0.0042\mathrm{PC_{it}} - 0.0007\mathrm{DUM_{it}} - 0.0004\mathrm{DUA_{it}} \\ & + 0.0888\mathrm{LEV_{it}} + 0.0025\mathrm{SIZE_{it}} - 0.0010\mathrm{BI_{it}} \\ & - 0.0101\mathrm{TOP_{it}} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [1]\end{aligned}$$

$$\begin{aligned}\mathrm{COD_{it}} = {} & -0.0432 - 0.0037\mathrm{BPC_{it}} + 0.0055\mathrm{BGEN_{it}} + 0.0004\mathrm{BAGE_{it}} \\ & - 0.0007\mathrm{DUM_{it}} - 0.0016\mathrm{DUA_{it}} + 0.0889\mathrm{LEV_{it}} \\ & + 0.0020\mathrm{SIZE_{it}} - 0.0009\mathrm{BI_{it}} - 0.0102\mathrm{TOP_{it}} + \mu_i + \varepsilon_{it}; \quad i \\ & = 1, \dots N; t = 1, \dots T \quad [2]\end{aligned}$$

$$\begin{aligned}\mathrm{COD_{it}} = {} & -0.0349 - 0.0086\mathrm{CPC_{it}} + 0.0059\mathrm{CGEN_{it}} + 0.0003\mathrm{CAGE_{it}} \\ & - 0.0002\mathrm{DUM_{it}} - 0.0014\mathrm{DUA_{it}} + 0.0883\mathrm{LEV_{it}} \\ & + 0.0020\mathrm{SIZE_{it}} - 0.0011\mathrm{BI_{it}} - 0.0072\mathrm{TOP_{it}} + \mu_i + \varepsilon_{it}; \quad i \\ & = 1, \dots N; t = 1, \dots T \quad [3]\end{aligned}$$

Based on all the discussions in the first parts of this essay and the results shown above, we observe the findings and suggestions to answer all the hypotheses posted earlier.

Political Connections and the Cost of Debt

From the results, we can observe that the overall political connection, the board chair's political connection, and the CEO's political connection all have a negative effect on the firm's cost debt which supports our hypotheses **H1**, **H2**, and **H3**.

Among the results, the general political connection has a significant negative effect on the firm's cost of debt at a 5% level. Political connection generally helps to reduce the cost of debt financing. The board chair's political connection has a significant negative effect on the firm's cost of debt; the significance reaches the 10% level (one-star). This means that the firms that have politically connected board chair have a 0.37% lower interest rate payment on average than the other firms. While the CEO's political connection also has a significant negative relationship with the firm's cost of debt. Since the p-value is less than 0.01, the significance of the relationship is at the 1% level, which is three-star significance. This indicates that the firms with politically connected CEOs have a 0.86% lower interest rate payment on average than the other firms. The findings show significant evidence for all the hypotheses **H1**, **H2**, and **H3** as expected.

From the above results, we can conclude that both the political connections of the board chair and the CEO are important to reduce the cost of debt financing for the firms. The impact of the board chair's political connection is slightly lower than that of the CEO's. Normally, in China, people believed that the board chair has more power than the CEO in the firm's daily operation. This phenomenon is especially found in China when compared with Western economies. The finding gives evidence that Chinese listed

firms are trying to learn from the advanced management experience and knowledge and develop in a more professional way. CEO having more influence in reducing the firm's cost of debt indicates that Chinese listed firms are transforming to the professional management model in their daily operation.

In Chapter One, we found that political connections have negative effects on firm performance, which means political connection reduces firm performance measured by Tobin's Q ratio; and that a politically connected board chair has more influence than a politically connected CEO on firm performance. Though the influence is negative, that reduces firm performance. We discussed the potential reasons that include politically connected leaders have less motivation to improve the efficiency of the firm; politically connected leaders bring bureaucracy in daily operations in the listed firms, which leads to poor performance in a monopolistic competition environment; and politically connected leaders are more likely to be less professional and less attention to the daily operations since they have their specific 'target' to act as bridges between the firms and the authorities, etc. The findings do not conflict with what we obverse in Chapter Two. First, the cost of debt is not the only decisive factor of firm performance; political connections can reduce the overall firm performance while being helpful in reducing the firm's cost of debt at the same time. Firm performance is determined and reflected by the combined influence of many factors like the firm's turnover, profitability, and efficiency, etc. A lower cost of debt is helpful to improve firm performance; however, it is not the only decisive factor that decides a firm's performance. Moreover, it is widely accepted that 'listing' itself is a more important way of financing for a Chinese firm rather than relying on borrowing. The amount of debt financing varies from firm to firm, and its importance also depends. Lowering the cost of debt is a benefit

that political connections can bring to the firm, but this benefit is likely to be offset by political connections' drawbacks and finally lead to the decrease of firm performance. As to the personal effects of politically connected board chairs and CEOs, politically connected CEOs have a less negative effect on firm performance does not conflict with our conclusion here that they are more helpful in reducing the firm's cost of debt.

Unlike general firm performance, a firm's cost of debt is a more specific issue among many other issues that need to negotiate case by case. In China, the board chair's power is reflected in his ability to control the overall situation and the direction of the firm. It is hard to imagine that the board chair can be involved in everything within the firm. It is not strange that the CEO plays a more decisive role in these cases on a daily basis; thus, the CEO has more influence on the firm's specific cost of debt. Moreover, for a highly politically related firm, it is likely that debt financing is not the most important funding source that it relies on. The board chair's political connection is more critical when the firm strives for a government bailout, interest-free loan, or direct funding from the government than the others. Hence, it is likely that the board chair participates less in dealing with commercial debt financing.

The political connections of the leaders are converted to the convenience of obtaining a lower interest rate in many ways. If the leaders are current government officials who are appointed as the managers of the firm, they may have position convenience to obtain low-interest loans from the government. Or they can represent both the government and the firm when discussing with banks to ask the banks to provide a preferential interest rate of the loans. As we know, in China, banks are special enterprises that are regulated by the government, and they need to abbey certain rules and

regulations to keep their license to continue banking. The banks can then exchange the low interest rate or convenient loan conditions for certain benefits they need with the government. This builds a mutual aid relationship between the commercial banks and the government.

If the leaders are former government officials, they can still use the relationship-based network to obtain a low interest rate. There is a representative phenomenon that many government officials quit their government positions in their middle age and become the top managers in the listed firms. They choose to become a manager in the firm is not because they do not want to continue as a government official. The reason is that the listed firms provide them with larger career development platforms, or the listed firms offer them better remunerations for the potential benefits the firms can have from their political connections.

Many people who want to have a great career in their lives treat each job they take as a part of the entire career network they build. It is also true to some of the current or former government officials. They realise the benefits of being government officials and the related political connections coming with the positions. It is beneficial for both themselves and the firms they move on to have and keep these political connections. It is not only about the personal network they build in their positions as government officials. The benefit of political connections is an aggregate of the system advantage they build when working in different social sectors and the information advantage they obtain when working as government officials. The information advantage lasts though they no longer work in the government. The results and evidence also support these suggestions.

Government Ownership, CEO Duality, and Personal Features

From Table 2-15, we observe that government ownership and CEO duality have negative relationships with the firm's cost of debt. While generally, the leaders' gender and age have a positive effect on the firm's cost of debt. These findings are in line with our main hypothesis **H4** and the rest hypotheses.

The evidence shows that though the relation is not significant, government ownership has a negative relationship with the cost of debt in all equations and estimations. The reason behind this phenomenon is that firms with government ownership have more opportunities to obtain government financial support and preferential loans. When they seek funds from commercial banks or other lending institutions, their government background can back up their credit even when they perform poorer than the other borrowers. To some extent, the strong credit of the government in Chinese society becomes part of the credit of the related listed firms.

Interaction Effects between Government Ownership and Political Connections

To analyse the interaction effects that may exist between government ownership and the political connections of the leaders, we further run estimations to see how the interaction effects affect the cost of debt. Below are the tables of the results for the interaction effects between government ownership, general political connection, the board chair's political connection, and the CEO's political connections.

Table 2-16 Government Ownership x General Political Connection

Government Ownership x Political Connection	Coef.	P-value
Controlled by the State x No Political Connection	-0.00008	0.983
Not Controlled by the State x Politically Connected	-0.00523	0.089
Controlled by the State x Politically Connected	-0.00366	0.356
Not Controlled by the State x No Political Connection	Omitted	Omitted

In the results above, 'Government Ownership' is a dummy variable that equals one if the firm is ultimately controlled by the state and zeros otherwise. 'Political Connection' refers to the firm's general political connection, which is a dummy variable that equals one if the firm is politically connected and zero otherwise. Thus, we have four combinations in the group which are:

(one, zero) – State-controlled firms with no political connection.
(zero, one) – Firms with political connections but not controlled by the state.
(one, one) – State-controlled firms with political connection.
(zero, zero, Omitted) – Firms without political connections and not controlled by the state.

Between general political connection and government ownership, we observe that general political connection in non-state-controlled firms has a significant negative effect on the cost of debt. The significance reaches the 10% level indicating that general political connection in non-state-controlled firms helps to reduce an average of 0.52% of the cost of debt. The other combinations both show negative effects though not significant, which is in line with our main results. The result of the firms with no political connection and not controlled by the state is omitted as both the values of the dummy

variables are zero. It is evident that the general political connection helps reduce the cost of debt. Compared with the main results considering government ownership and political connection separately, only the firms with general political connection but not controlled by the state significantly affect the cost of debt. The significance also drops to a 10% level. These findings indicate that having government ownership does not significantly reduce the firm's risk in the credit markets to help the firms achieve a lower cost of debt.

Table 2-17 Government Ownership x Board Chair's Political Connection

Government Ownership x Political Connection (Board Chair)	**Coef.**	**P-value**
Controlled by the State x No Political Connection	-0.00254	0.511
Not Controlled by the State x Politically Connected	-0.00904	0.007
Controlled by the State x Politically Connected	-0.00352	0.376
Not Controlled by the State x No Political Connection	Omitted	Omitted

In the results above, 'Government Ownership' is a dummy variable that equals one if the firm is ultimately controlled by the state and zeros otherwise. 'Political Connection' refers to the board chair's political connection in a firm, which is a dummy variable that equals one if the firm's board chair is politically connected and zero otherwise. Thus, we have four combinations in the group which are:

(one, zero) – State-controlled firms without the board chair's political connection.
(zero, one) – Firms with the board chair's political connections but not controlled by the state.
(one, one) – State-controlled firms with the board chair's political connection.
(zero, zero, Omitted) – Firms without the board chair's political connections and not controlled by the state.

We observe similar results for the interaction effects between government ownership and the board chair's political connection. It shows that politically connected board chairs in non-state-controlled firms have significant negative effects on the cost of debt at the highest 1% level. They help to reduce an average of 0.90% of the cost of debt. The other combinations show negative effects though not significant, which is in line with our main results. The result of the firms without the board chair's political connection and not controlled by the state is omitted as both the values of the dummy variables are zero. It is evident that the board chair's political connection helps reduce the cost of debt. Compared with the main results considering government ownership and the board chair's political connection separately, only the firms with the board chair's political connection but not controlled by the state significantly affect the cost of debt. These findings indicate that having government ownership does not significantly reduce the firm's risk in the credit markets when the board chair is politically connected to help the firms achieve a lower cost of debt.

Table 2-18 Government Ownership x CEO's Political Connection

Government Ownership x Political Connection (CEO)	**Coef.**	**P-value**
Controlled by the State x No Political Connection	-0.00134	0.713
Not Controlled by the State x Politically Connected	-0.01184	0.000
Controlled by the State x Politically Connected	-0.00711	0.097
Not Controlled by the State x No Political Connection	Omitted	Omitted

In the results above, 'Government Ownership' is a dummy variable that equals one if the firm is ultimately controlled by the state and zeros otherwise. 'Political Connection' refers to the CEO's political connection in a firm, which is a dummy variable that equals one if the firm's CEO is politically connected and zero otherwise. Thus, we have four combinations in the group which are:

(one, zero) – State-controlled firms without the CEO's political connection.
(zero, one) – Firms with the CEO's political connections but not controlled by the state.
(one, one) – State-controlled firms with the CEO's political connection.
(zero, zero, Omitted) – Firms without the CEO's political connections and not controlled by the state.

It shows that politically connected CEO in non-state-controlled firms have significant negative effects on the cost of debt at the highest 1% level, which is in line with our main results. Politically connected CEO in non-state-controlled firms helps to reduce an average 1.12% of the cost of debt. Politically connected CEO in state-controlled firms also has a significant

negative effect on the cost of debt with a 10% significance level. It indicates that politically connected CEOs in state-controlled firms help to reduce an average of 0.71% of the cost of debt. The results of the firms with no politically connected leaders and not controlled by the state are omitted as both the values of the dummy variables are zero. The results support our findings that politically connected leaders reduce the firm's cost of debt financing. Compared with the main results considering government ownership and the CEO's political connection separately, only the firms with the CEO's political connection but not controlled by the state significantly affect the cost of debt at the same level. When the CEO is politically connected, and the state controls the firm, the significance level drops to a 10% level. These findings indicate that having government ownership does not significantly reduce the firm's risk in the credit markets when the CEO is politically connected to help the firms obtain a lower cost of debt.

As to the relationship between CEO duality and the cost of debt, the findings suggest that CEO duality is negatively related to the firm's cost of debt in all three estimations. Though the effect is not significant, the evidence shows that having the CEO and the board chair as the same person helps the firm to reduce the interest rate payment. It is widely accepted that having the CEO and board chair as the same person means the power of the firm is concentrated. But on the other hand, we can suggest that these leaders have better capabilities, especially when they have political connections. Power-concentrated leaders make more choices directly in daily operations, which reduces the difficulties in approaching the agreement for strategies. This helps to reduce the cost for corporate governance to some extent and improve the efficiency of the firms, which may contribute to lower interest rates offered by the lending institutions based on performance.

The evidence also shows that the leaders' gender and age are the other two important factors that influence the firm's cost of debt. According to Table 2-15, both male board chair and male CEO lead to a higher cost of debt. For example, the result indicates that firms having male board chair generally have a 0.55% higher interest rate on average than the other firms. Based on the result, we observe that the female board chair and CEO are more favourable for the firms to reduce the cost of debt.

As to the age of the leaders, we observe that both the board chair's age and the CEO's age are positively related to the cost of debt. The impact of the board chair's age is significant at the highest 1% level rated at three-star. The impact brought by the CEO's age is also significant at the 5% level rated at two-star. The results show that one unit increase of the board chair's age lets the firm has a 0.04% higher interest rate; one unit increase of the CEO's age lets the firm has a 0.03% higher interest rate. The results suggest that older firm leaders increase the interest rate of debt financing for the firms. This may be because younger leaders have more passions and financial motivations to operate the firm better to obtain either career or financial benefits. Younger leaders are more likely to be in the 'early stage' of their careers. They may lack the related experience to improve the overall firm performance efficiently; however, they are eager to prove themselves via success in specific issues or projects to make their positions more stable. They are more willing to reduce the cost of debt and the cost of other operations to improve the profitability of the firm that they can prove their abilities as firm leaders. The finding suggests that younger firm leaders are favourable to reduce the firm's cost of debt.

Control Group

In the control group, we have Leverage, Firm Size, Board Independence, and Credit Rating Information as control variables. According to Table 2-15, we observe that all the variables in the group have the same direction and significance in each equation.

Among the control variables, leverage and firm size have positive effects on the firm's cost of debt. Board independence and credit rating information both have negative effects on the cost of debt. The results show that the effect of leverage is significant at the 1% level in Equation [1], [2], and [3]. This indicates that higher leverage is considered to increase the potential risks of the firm hence increases the firm's cost of debt. We also observe that firm size is significantly positively related to the cost of debt at the highest 1% level in Equation [1] since the p-value is less than 0.01. It shows significance at 5% level in Equation [2] and [3]. The results indicate that larger firms are more likely to get a higher interest rate on debt financing. This may be due to the reason that larger firms are more likely to have a higher volume of bad debt, which make them riskier. As to the board independence and credit rating information, the results indicate that higher board independence and credit rating reduces the firm's cost of debt. This indicates that more independent directors on board and having 'Big Four'* as the firm's audit firm is favourable when the firm seeks debt financing. The effect of credit rating information on the cost of debt is significant at the 10% level in Equation [1] and [2]. It shows that having 'Big Four' as the firm's audit firm helps the firm to reduce an average of 1% of the cost of debt.

*The 'Big Four' refers to the biggest four professional audit firms in China, which are PwC, DTT, KPMG, and EY, based on their turnover by the year 2017.

2.4.3 Robustness Tests

To test the robustness of the main results, we first ran the estimation of the fixed effects with clustered standard errors to see whether there are any material changes in the results; we then added two additional variables (cash flow and growth) in the control group and tested all three equations.

2.4.3.1 Fixed Effects Estimation with Clustered Standard Errors

We first ran the estimation of the fixed effects with clustered standard errors for panel data to see whether there are any material differences between the main results and the results of this version. We applied *fe vce(robust)* code in STATA after all three equations, which will automatically give standard errors clustered at the id level. The robustness is meant to allow for violations of homoscedasticity in the cross-sectional dimension or heteroscedasticity. *vce(robust)* uses the robust White/sandwich estimator of variance that gives 'robust' standard errors, which are robust to some types of misspecification and removes the effects brought by the potential outliners.

The results of the estimation of the fixed effects with clustered standard errors are shown below:

Table 2-19 Fixed Effects Estimation with Clustered Standard Errors

	Equation [1]	Equation [2]	Equation [3]
VARIABLES	Cost of Debt	Cost of Debt	Cost of Debt
Political Connection	-0.00420**		
	(0.00242)		
Board Chair's Political Connection		-0.00366*	
		(0.00239)	
Board Chair's Gender		0.00552	
		(0.00452)	
Board Chair's Age		0.000405***	
		(0.000143)	
CEO's Political Connection			-0.00863***
			(0.00291)
CEO's Gender			0.00585
			(0.00399)
CEO's Age			0.000282*
			(0.000154)
Government Ownership	-0.000653	-0.000668	-0.000195
	(0.00390)	(0.00388)	(0.00388)
CEO Duality	-0.000396	-0.00158	-0.00139
	(0.00248)	(0.00246)	(0.00247)
Leverage	0.0888***	0.0889***	0.0883***
	(0.00608)	(0.00609)	(0.00610)
Size	0.00246*	0.00200	0.00200
	(0.00133)	(0.00133)	(0.00136)
Board Independence	-0.00104	-0.000851	-0.00106
	(0.00168)	(0.00168)	(0.00167)
Credit Rating Information	-0.0101	-0.0102	-0.00717
	(0.00687)	(0.00689)	(0.00636)
Constant	-0.0283	-0.0432	-0.0349
	(0.0306)	(0.0308)	(0.0306)
Observations	16,635	16,609	16,590
R-squared	0.049	0.049	0.050
Number of id	2,560	2,558	2,557

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From the table above, we observe that the robust version of the estimation of the fixed effects shows the same pattern as the main results. For the relationship between the general political connection and the cost of debt, the negative effect stays at the highest 5% level, which indicates general political connection brings an average decrease of 0.42% of the firm's cost of debt. As to the negative effects brought by the board chair's and CEO's political connection, the significance levels stay at 10% and 1%, respectively. The leader's gender's effect is still not significant. The board chair's age's effect stays at the highest 1% level while the CEO's age's effect drops slightly to 10% level. The results show that male leaders bring a higher cost of debt, while senior leaders have the same effect. The results support our main results and findings that both the general political connection and the leaders' political connections are helpful to reduce the firm's cost of debt. Female and younger leaders are favourable when the firm seeks debt financing.

2.4.3.2 Fixed Effects Estimation with Additional Control Variables

To further investigate the robustness of the main results, we followed Bliss and Gul (2012) and added two variables which are cash flow and growth, into the control group to see whether there are material changes in the results.

Table 2-20 Fixed Effects Estimation with Additional Control Variables

VARIABLES	Equation [1] Cost of Debt	Equation [2] Cost of Debt	Equation [3] Cost of Debt
Political Connection	-0.00231*		
	(0.00130)		
Board Chair's Political Connection		-0.00268**	
		(0.00134)	
Board Chair's Gender		0.00775***	
		(0.00295)	
Board Chair's Age		0.000362***	
		(8.36e-05)	
CEO's Political Connection			-0.00417***
			(0.00150)
CEO's Gender			0.000502
			(0.00242)
CEO's Age			0.000151*
			(8.25e-05)
Government Ownership	-0.000486	-0.000611	-0.000417
	(0.00243)	(0.00242)	(0.00243)
CEO Duality	-0.00212	-0.00282**	-0.00263*
	(0.00134)	(0.00134)	(0.00138)
Leverage	0.0475***	0.0477***	0.0472***
	(0.00298)	(0.00297)	(0.00298)
Size	0.000607	0.00103*	0.000762
	(0.000615)	(0.000626)	(0.000628)
Board Independence	-0.00163*	-0.00141	-0.00174*
	(0.000947)	(0.000948)	(0.000947)
Credit Rating Information	-0.00358	-0.00365	-0.00345
	(0.00375)	(0.00374)	(0.00374)
Growth	-0.00306***	-0.00281***	-0.00293***
	(0.000965)	(0.000966)	(0.000968)
Cash Flow	-0.0347***	-0.0345***	-0.0350***
	(0.00439)	(0.00439)	(0.00440)
Constant	0.0823***	0.0660***	0.0793***
	(0.0142)	(0.0146)	(0.0145)

VARIABLES	Equation [1] Cost of Debt	Equation [2] Cost of Debt	Equation [3] Cost of Debt
Observations	14,109	14,091	14,075
R-squared	0.038	0.040	0.038
Number of id	2,267	2,265	2,265

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

For the above estimation, we follow Bliss and Gul (2012) and add two variables which are cash flow and growth, into the control group. Growth is calculated the same as essay one, which is the ratio of the observation year's total assets minus the previous year's total assets to the previous year's total assets. Cash flow is the scale cash flow on average total assets, which is calculated as the firm's cash flow divided by the average total assets.

From the table above, we observe that all the patterns are the same with our main results and the significance levels are similar as well. For all the political connection variables, we find that they still have negative effects on the cost of debt which indicates political connections help reduce the firm's cost of debt. The significance level of the general political connection drops slightly to 10%, while the significance level of the board chair's political connection increase to a 5% level. The effect of the CEO's political connection stays at the highest 1% level. As to the effects of the leaders' gender and age, the results indicate that male and senior leaders lead to a higher cost of debt for the firms. The only difference is that the effect of the board chair's gender becomes significant, while the significance level of the effect of the CEO's age slightly drops to one-star. Government ownership and CEO duality both have negative effects on the cost of debt but not significant in all three equations.

For the control group, the results support our finding that leverage and firm size have positive effects which lead to the increase of the cost of debt; while board independence and credit rating information both have negative effects on the cost of debt which indicate that firms with higher board independence and higher credit rating information are favourable when seeking debt financing. As to the additional variables we add in this estimation, we observe that both growth and cash flow are significantly negatively related to the cost of debt. The results indicate that a higher growth rate and more cash flow help the firm to get a lower cost of debt. It shows that a one-unit increase in growth rate reduces the firm's cost of debt by around 0.3%, while a one-unit increase in cash flow reduces the firm's cost of debt by around 3.5%. A higher growth rate and more cash flow indicate that the firm is more likely to have better repayment ability and possibility; hence they are favourable when the firm seeks s for debt financing.

Based on the estimations above, we found that the results of the fixed effect estimation with clustered standard errors show the same pattern and similar significance compared with our main results, which support our findings. When we add two additional control variables (growth and cash flow) to the estimation of the fixed effects, the results indicate that a higher growth rate and more cash flow in a firm reflect better repayment ability and possibility; hence they are favourable when the firm seeks s for debt financing. For the remaining variables, we found that the results stay significant, showing the same pattern as well; hence our main results would have been robust.

2.5 Conclusion

This essay studied the political economy in China and the relationship between political connections and the firm's cost of debt. The study period is eleven years, from 2006 to 2016, and the dataset includes all the listed firms in Chinese stock markets except for the firms in the Finance sector. During the empirical analysis, a panel data methodology and the estimation of the fixed effects were used.

For all the estimations, the cost of debt is the dependent variable that is measured by the interest expense of the firm divided by the sum of average long-term and short-term debt (Bliss and Gul, 2012); while the main independent variables include the firm's political connections, government ownership, CEO duality, the leader's gender, and the leader's age. Other than these variables, this essay includes controlling variables that are leverage, firm size, board independence, and credit rating information.

As expected, the general political connection has a significant negative effect (two-star) on the firm's cost of debt which means firms with politically connected leaders have a lower interest rate. Government ownership and CEO duality both have a negative effect on the firm's cost of debt though the effect is not significant. The board chair's political connection has a significant negative effect on the firm's cost of debt, with the significance reaching the 10% level (one-star). This means that firms that have politically connected board chairs have a 0.37% lower interest rate payment on average than the other firms. The CEO's political connection also has a significant negative relationship with the firm's cost of debt. Since the p-value is less than 0.01, the significance of the relationship is at the highest 1% level, which is three-star significance. This indicates that the firms with politically

connected CEOs have a 0.86% lower interest rate payment on average than the other firms. The impact of the board chair's political connection is slightly lower than that of the CEO's.

The findings also suggest that male and senior leaders lead to a higher cost of debt which indicates that female and younger leaders are favourable when the firm seeks debt financing. The effects of both the board chair's age and the CEO's age are significant at the 1% and 5% levels, respectively. Among the control variables, leverage and firm size have a positive effect on the firm's cost of debt. Board independence and credit rating information both have negative relationships with the firm's cost of debt.

The political connection is increasingly considered as an important influencing factor of the cost of debt. Extant research shows that political connection is beneficial to the firms since it can bring advantages during financing progress, obtaining government bailouts, and regulation exceptions. However, there are also scholars who indicate that political connection has no effect on the firm's cost of debt. This happens when scholars employ even the same definition of the political connection but apply them in different countries and economies.

Thus, we find that the current literature is limited on this issue; and that the relationship between political connection and the cost of debt in China is not widely mentioned. Some studies have investigated the political connections in Chinese listed firms, but they ignore their effect on the cost of debt. While other studies try to investigate the cost of debt, but they focus more on the access of funds and preferential bank loans. This essay provides a comprehensive dataset of a long period and focuses directly on the relationship between political connection and the cost of debt in China.

Evidence is found that political connections help firms to reduce the cost of debt. It extends the current understanding of how political connections affect a firm's cost of debt under Chinese circumstances. It also contributes by making a distinction between the board chair and the CEO's political connection and investigating their effects on the firm's cost of debt.

The findings of this essay provide a new contribution to our academic understanding of the effects of political connections of the leaders on the firm's cost of debt in Chinese listed firms. It also examines other key influencing factors such as government ownership, CEO duality, and the leader's personal features. This essay provides information that could inform trading strategies for investors and institutions in the market as well as having policy implications for the authorities. The findings provide evidence and suggestions for the daily operations and long-term strategies for Chinese listed firms to reduce the cost of debt.

However, the limitation of this essay is that we only have one measurement of the firm's cost of debt. As to the findings and suggestions, there is no sub-sample test for the estimations, which can provide more analysis about the issues. Future research should take the direction of a more detailed analysis of the relationship between political connections and the firm's cost of debt in sub-samples with more measurements to compare the results.

Appendix

Correlation Coefficient of the Variables – Chapter 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1													
2	0.0198	1												
3	0.0232	0.9040	1											
4	0.0215	0.0100	0.0005	1										
5	-0.0204	0.1267	0.1284	0.0551	1									
6	-0.0087	0.5812	0.3986	0.0041	0.0386	1								
7	0.0234	-0.0021	0.0045	0.2386	0.0026	-0.0104	1							
8	-0.0212	0.0383	0.0219	0.0248	0.2954	0.1154	0.0348	1						
9	0.0988	0.0233	0.0261	0.0484	0.0567	-0.0482	0.0863	0.1183	1					
10	0.0778	0.0777	0.0258	0.0071	0.1290	-0.2039	-0.0187	-0.1429	0.2742	1				
11	0.4021	-0.0001	-0.0042	0.0181	-0.0444	-0.0376	0.0124	-0.0019	0.2420	0.1297	1			
12	0.0814	0.0849	0.0899	0.0231	0.1863	0.0068	0.0438	0.1538	0.3130	0.1595	0.2597	1		
13	0.0459	0.0679	0.0699	0.0251	0.0693	0.0212	0.0504	0.0751	0.2307	0.1130	0.1014	0.2943	1	
14	0.0123	0.0164	0.0106	0.0155	0.0965	-0.0010	0.0033	0.0593	0.1390	0.0740	0.0639	0.3696	0.1489	1

*1: Cost of Debt Ratio; 2: Political Connection; 3: Board Chair's Political Connection; 4: Board Chair's Gender; 5: Board Chair's Age; 6: CEO's Political Connection; 7: CEO's Gender; 8: CEO's Age; 9: Government Ownership; 10: CEO Duality; 11: Leverage; 12: Firm Size; 13: Board Independence; 14: Credit Rating Information.

Chapter 3

Leaders' Demographics, Corporate Governance and Firm Performance: Evidence from China

3.1 Introduction

Since the economic reform and opening-up in the 1970s, we have witnessed the development of the Chinese economy. Although many Chinese listed firms have found their places among the best in the world, we must admit that both domestic and international competitions have become much more intense than before. Hence, human capital has become an important focus to build the firm's advantage for greater achievements.

The concept of human capital is from macroeconomics. According to Schultz (1993), 'Human Capital' is a firm's asset to improve productivity and unique advantage to make itself competitive to the others. If we take the leaders to be the brain of the firm, what they can bring from their knowledge, experience, and characteristics become a key asset to boost firm performance.

Firm performance, on the other hand, is usually investigated by financial means. Among the many measurements, studies frequently use Tobin's Q ratio (Tobin, 1969), return on assets (Selvarajan et al., 2007; Hsu et al., 2007), return on investment (Grossman, 2000), etc. Marimuthu et al. (2009) point out that human capital, especially the heterogeneity of leaders, is attracting greater focus as the development of the global economy slows down in the last decade. Upgrading the quality of human capital has become a solution to boost firm performance and economic growth, among which the leaders' demographics tend to be an important factor impacting firm performance.

The reason why leaders' demographics are likely to affect firm performance has been mentioned in recent literature. Many studies show that the leader's age and education have a positive relationship with firm performance. There are also many findings indicating that a female leader in a firm helps to

improve firm performance better than male leaders. Generally, scholars point out that older leaders bring better performance for the firm based on their experience and risk-averse characteristic (Barker III and Mueller, 2002; Yim, 2013; Serfling, 2014; Xie, 2015). Regarding the gender of the leaders, Lam et al. (2013) show that female leaders have more chances and participate more in the firm's daily operations than they did before. Other studies show that female leaders improve the firm's performance (Nguyen et al., 2015; Adams and Ferreira, 2009). Evidence implies that older and female leaders tend to reduce the firm's risk level through safer investment policies or development strategies; female leaders tend to improve the efficiency of corporate governance and firm performance since they are 1) easier to comply with rules than male leaders; 2) biologically more attentive and showing more patience than males generally, and 3) tend to spend more time before launching a project or plan to prepare for a better strategy to avoid risks and lower the probability of failure. As to the education of the leaders, most scholars agree that better education in leaders brings better firm performance (Ramachandran and Shah, 1999; Jalbert et al., 2002; Carpenter, 2002) since education widens the horizon and enhances the knowledge of the leaders and makes their advantage of competing with other leaders. Hence, leaders with better education improve firm performance. Education also makes the leaders more likely to become professionals in their areas, which helps them make better choices facing changes and competitions in daily operations. A higher education degree is more likely to distinguish a leader from the other in terms of knowledge and ability.

The reason why corporate governance is likely to affect firm performance has also been investigated in recent literature. Direct measurement of corporate governance includes board size, board independence, CEO duality, auditor's information etc. (Khanchel, 2007). The discussion of board

independence indicates that board independence has negative relationships with firm performance since large boards or board independence reduces the corporate governance efficiency hence firm performance (Yermack, 1996; Bennedsen et al., 2008). The effect of management shares is also mentioned in the literature. The discussion of management shares is grounded in agency theory (Fama and Jensen, 1983). Scholars indicate that management shares have positive relationships with firm performance (Hölmstrom, 1979; Berle and Means, 1932; Hölmstrom, 1982; and Morck et al., 1988) since management shares reduce the effect of the agency problem of the leaders hence improve firm performance. Apart from the variables above, the leader's gender and age are also considered to affect firm performance via corporate governance. As we know, the impact of good governance includes board effectiveness, talent attraction, low-operational costs, risk management etc. Jianakoplos and Bernasek (1998) find that women and men have different behaviour patterns when making investment strategies. Male leaders are more likely to choose risky projects and make aggressive investments. Female leaders are more likely to stay safe and consider the risk and return on certain investment strategies to avoid potential loss. Adams and Ferreira (2009) further indicate that the attendance of female top managers for meetings is significantly higher than male top managers. It is easier for female leaders to comply with rules than male leaders; hence they improve the efficiency of corporate governance and firm performance. Similarly, senior leaders are found to bring better firm performance and less risk (Barker III and Mueller, 2002; Yim, 2013; Serfling, 2014; Xie, 2015). Senior leaders have gain experience and knowledge through their careers. They tend to build strategies that allow lower risks to avoid potential loss. What is more, young leaders are more eager and 'urgent' to make contributions to the firms so that they can ensure their position and improve their financial compensations. Thus, young leaders tend to allow more risk

in the firm's daily operations, which brings more fluctuations and potential poor performance of the firm.

Although the relationship between leaders' demographics and firm performance has increasingly been being mentioned in the research, extant research shows conflicting results, and scholars still cannot achieve an agreement towards the issues. Some scholars indicate that female and senior leaders improve firm performance (Barker III and Mueller, 2002; Yim, 2013; Nguyen et al., 2015), while others insist that gender and age do not affect firm performance (Dang et al., 2017; Ye et al., 2010). Regarding education level, some scholars believe that leaders with a higher level of education bring better firm performance (Ramachandran and Shah, 1999; Jalbert et al., 2002; Carpenter, 2002;). There are also studies that find that the leader's education has no effect on firm performance at all (Dyke et al., 1992; Ahn et al., 2009; Bhagat et al., 2010; Gottesman and Morey, 2006a; Gottesman and Morey, 2006b). Thus, we find that the current literature is limited on this issue under Chinese circumstances. Existing research under Chinese circumstances either uses a small sample (e.g., private firms only), or the study period is relatively short. Some studies investigate similar topics, but they are not able to provide a comprehensive view due to the lack of education data of the leaders in currently available datasets. This essay starts with the Human Capital framework to include gender, age, and education levels as the measurements of the leader's demographics. This essay contributes to providing a comprehensive understanding of the topic from a long period dataset; we manually collect the leader's education data from the firm's annual report and other official financial websites where the data is missing in current public datasets. Evidence is found that female leaders and senior leaders significantly improve firm performance. Firm performance is also significantly improved by leaders having a PhD degree. This essay

extends the current understanding of how leaders' demographics affect firm performance in the context of China. It also contributes to an understanding of the trend of corporate governance in China. The findings of this essay provide a comprehensive view of the effects of leaders' demographics on the firm performance in Chinese listed firms. It not only provides information on trading strategies for investors and institutions in the market, but it also indicates the trend of corporate governance where female are becoming more welcome in modern Chinese society. The findings provide evidence and suggestions for the daily operations and long-term strategies for Chinese listed firms to improve firm performance.

In this essay, we define the leaders as the board chair and the CEO since they are the top two most powerful managers in the firm and act as the firm's brain and engine in most cases. This essay investigates the relationship between leaders' demographics and firm performance in all Chinese listed firms. We employ the leaders' gender, age, and education level as measurements of the demographics. The control variables include leverage, firm size, growth, board independence, and management shares. The study period is eleven years, from 2006 to 2016.

The dataset employed in this essay is from the China Stock Market and Accounting Research Database (CSMAR), which includes all the information from the firm's balance sheet and other financial reports. However, part of the information regarding the leaders' education level is not available directly in CSMAR. Thus, for all the missing information, we manually collected the data from the listed firm's annual reports and other official financial websites (such as Bloomberg.com, Yahoo Finance, Finance iFeng, etc.).

The literature review follows in part two. Part three is the main part offering the hypotheses, data, and methodology, and part four, the empirical analyses and results. Finally, a summary of the findings and the conclusion is given.

3.2 Literature Review

Scholars have long been arguing that the top managers' heterogeneities explain differences between firms. This 'chemical reaction' process even starts when a firm selects its top managers like the CEO and board chair. During the turnover process, the firm's decision depends on the benefit that the CEO/board chair can bring to the firm. It is believed that CEOs and the board chairs convert their experience, talent, and knowledge into the outcome expected by the firms via different channels. Thus, top managers' heterogeneities and demographics are an important research area.

The issue begins when the firm starts to pick the ideal leader. Kaplan et al. (2012) employ a dataset to investigate how a firm would pick its CEO nominee when the firm is in the process of acquisition or venture investment and then connect the CEO's heterogeneities to firm performance. They define the CEO's talent as being of two categories: one category is about the CEO's overall capability; the other category is about the CEO's personal ability such as the ability to communicate, the ability to manage the firm, and the ability to connect the people in the firm. They conclude that the ability to implement has a positive effect on firm performance.

The debate on this issue will continue as we identify many conflicting results and suggestions in recent studies below.

3.2.1 Gender and Age

3.2.1.1 The Leader's Gender, Firm Strategy and Firm Performance

An important issue that is mentioned most in this area is the top manager's gender. Scholars have long been arguing that gender is an important influencing factor when people make decisions. Thus, as a top manager, he or she may make different operation decisions subconsciously depends on the gender feature and have an impact on the firm's strategy and performance.

Withisuphakorn and Jiraporn (2017) focused on the impact of CEO age and gender since our society does not currently have gender equality in the career world. Women have many challenges in their careers and at home. It is more difficult and takes more time for women to achieve high positions in a firm compared with men. Thus, they predict that female CEOs are older than male CEOs in most cases. However, they find out that female CEOs are younger than male CEOs in their sample as much as two years on average. The evidence shows that the age difference represents twenty-six across the whole sample.

Lam et al. (2013) investigated the relationship between CEO gender, salary, and firm performance in China. They used a sample of Chinese listed firms from 2000 to 2008. In their sample, 4.4% of the CEOs in the firms were female. The evidence showed that female CEOs take part in the firm's daily operation at a higher level compared with previous cases. They found that female CEOs are more likely to be found in non-state-owned firms. They indicated that this change is due to the market's encouragement of gender equality and that this is welcomed by the private economic sector. The

findings suggest that when the firm has female directors on board, there is a higher possibility that the firm would have a female CEO. Concerning CEO salary, they found that female CEOs and male CEOs still have different salaries given the same position and job, which indicates that a female CEO still earns less than a male CEO in a firm. In the final analysis, they found no significant relation between CEO gender and firm performance.

Nguyen et al. (2015) further looked at the impact of the board's gender on firm performance from a financial view. They chose a sample from a non-developed economic society, Vietnam, and looked at the data using a sample from 2008 and 2011. They indicated that gender on the board influences firm performance, which is in line with previous theories. They also documented that the number of female directors has a positive relation to firm performance. The evidence further showed that the benefit brought by female directors is limited to firm performance. When the female directors on the board reached twenty per cent of the whole board, the benefits brought on firm performance stopped growing any further. They concluded that this is due to the potential cost of having female directors being higher than the benefits after this point.

Earlier in 2009, Adams and Ferreira (2009) found that female directors significantly affect firm performance. According to their study on a sample of the listed firms in the United States, they recorded that female directors have a higher participation rate than male directors when having board meetings. But compared with the firms that did not have women on the board, firms that have women on the board had better participant rates than male directors. There were found to be more female directors on the monitoring committee if the firm had a high gender diversity on the board. They concluded that it is beneficial for the firm to monitor its daily operations.

Regarding firm performance, they found that the change of CEO is a more important factor compared with the gender on the board. The evidence showed that gender diversity brings a bad influence on firm performance. The findings suggest that female directors on board are good for the firms with poor corporate governance since they can improve the operation quality in the firms. But in firms with good corporate governance, female directors on the board are harmful to firm performance.

Adams and Funk (2012) analysed how women are different from men when they work on the board in a firm. Despite the natural biological difference women and men have when making choices, they also work in a different way in firms facing risks and investment projects. They employed a dataset of the directors and found that female and male directors have different values and ways to treat risks. The difference does not come from the gender difference among society only. The evidence shows that female directors are more friendly and caring, but they normally have less power. Compared with the ordinary people in society, female directors are willing to create a new environment than male directors but are less willing to stay safe. Female directors are more likely to take risks shown in their research; thus, their research offers suggestions concerning a firm's corporate governance —that it is not necessary to make risk-averse decisions just because they have a female director.

The results above are not in line with earlier research of Jianakoplos and Bernasek (1998), though. They investigated whether gender has an impact on a person's risk decision making in the population in the United States. They employed a dataset of household assets held by the population in the United States and found out that women are generally more risk-averse than men. The data showed that women had less risky assets in their household

assets than men, which indicates that they prefer to stay safe with their assets and future cash flow. Even in the situation that they have more assets, women chose to have less of an increase in risky assets out of the whole increase of the assets. The difference between women and men in choosing risky assets indicates their attitudes towards risks in their financial plan. The evidence shows that gender is not the only factor that affecting people's financial choice. Ethnicity, age, and household size are also influencing factors for financial choice. However, risk-averse behaviour also has a negative effect on personal earnings that make women less wealthy than men.

Ye et al. (2010) focused on the Chinese market and tried to investigate how the gender of leaders has an impact on the firm's earnings. They employed a dataset of the listed firms in China and compared the results for China with those of the United States. The results showed that the gender of the leadership in a firm has different influences on firm earnings. In China, the leader's gender has no significant effect on firm earnings, cash flows, and stock returns.

There is other research on how the leader's gender affects a firm's financial choice. Huang and Kisgen (2013) focused on the different outcomes of investment projects made by female and male managers. The evidence showed that men used to initiate more acquisitions and rely more on debt financing than women in a firm's top management team. Gender also tends to affect the returns of the project. The findings indicate that acquisitions initiated by men have lower returns by as much as two per cent. This also happens in a firm's debt financing when made by men and women accordingly. On the other hand, female top manager tends to execute stock option earlier than males. Their research indicated that male top managers tend to be over-confident in a firm's financial decision-making process.

3.2.1.2 The Leader's Age, Corporate Governance and Firm Performance

Many studies try to investigate this issue comprehensively. Barker III and Mueller (2002) pointed out that researchers had failed to notice the influence of the top managers regarding the firm's development and decision making. They attempted to study the relationship between the top managers' characteristics and the firm's research and development (R&D) investment. They employed a dataset of listed firms and found out that the CEO's attributes are significantly related to the difference of a firm's R&D investment compared to its rivals. They indicated that R&D investment is negatively related to CEO age, which means younger CEOs can boost the firm to have more R&D investment. Higher R&D investment is also found in firms whose top managers own more shares of the firm, or whose top managers have a working history related to marketing or R&D. Then, they further analysed the CEO's education as an influencing factor of the firm's R&D investment. Findings were suggestive that education is not related to the firm's R&D investment if the CEO has an undergraduate degree. But if the CEO's degree is within a developed science category, it was associated with bringing more R&D investment to the firm. In the end, they ran a sub-sample analysis which suggested that a longer-term office of the CEO is also beneficial in respect of the firm's R&D investment. This finding indicates that if a CEO can work in a firm for a long time, he or she is then likely to modify the firm's R&D investment in his or her favour.

Apart from the complicated cases above, researchers are focusing on three areas: the effect of the leader's age, gender, and education. These factors are most influential on a manager's ability to work, plan, and make decisions, which will, in turn, affect the firm's performance.

Nelson (2005) employed a sample of one thousand seven hundred and seventy-one firms over fifteen years to investigate how CEO demographics and the overall corporate governance affects firm performance. During the fifteen-year research period, many firms in this sample had changed in their corporate governance. In the firms that had a good performance, the shareholders were more willing to give authority to their top managers. In the firms that had a bad performance, the shareholders are more willing to make changes in the way of corporate governance. However, the findings showed no evidence of the influence brought by the CEO's demographics on corporate governance hence firm performance.

Orens and Reheul (2013) found some evidence of the effect of the CEO's age on a firm's cash flow. Previously, researchers had been focusing on this case from the financial and accounting perspectives. Orens and Reheul (2013) try to investigate this case from the aspect of the CEO's demographics. They employed a dataset of firms in Belgium. The evidence showed that the cash position in the firm is positively related to the CEO's age. They indicated that older CEOs tend to have more preventive plans for the cash position in their firms. They also found evidence that CEOs who have no working experience in other areas tend to have more cash in their firms. Particularly, older CEOs are more likely to ignore the potential cost of cash positions. Since a firm's cash flow has an effect on firm value, the above findings show directions for firm owners to pick the ideal CEO for better firm value and performance.

Another research focusing on the relationship between the CEO's age and the firm's choice to take risks was Serfling (2014). Serfling (2014) concluded that the CEO's age is normally considered as negatively related to the firm's

willingness to take the risk in previous studies. He further indicated that when a firm's willingness to take the risk is lower, the stock price of this firm will become less fluctuant. In his research, he found evidence that the CEO's age negatively affects the firm's stock price fluctuation. This means the older the CEO is, the more stable the stock price is. The author suggested that this is due to the preference of the CEO on risk investment. Older CEOs tend to reduce the funds spent on R&D projects like innovations. They tend to invest more in low-risk projects and diversify the management of the firm with low running leverage. The study further found that this effect was most significant when the CEO and the second person in charge were both older. If the firm's CEO and the second person in charge were both younger, then the firm was highly likely to take risky projects, and the stock price was more fluctuant. The firm's willingness to take risk largely depends on the preference of the CEO, therefore. The findings provide investment suggestions according to the research, which included investing more in those stocks of firms managed by young leaders and in fewer stocks of firms that are managed by older leaders. This strategy could benefit investors through risk adjustment. The author concluded finally that the CEO's age negatively affects a firm's stock price fluctuation and performance.

Yim (2013) investigated the CEO's age effect on firm performance from another perspective. He investigated the relationship between the CEO's age, the CEO's salary, and the firm's strategy during an acquisition. He found that CEOs were more likely to have a long-lasting rise in their salary when the firm completed a successful acquisition. This becomes a monetary motivation for the CEOs to push into acquisition projects even in the early stages of their position. The findings suggested that the older the CEO was, the less likely the firm was to take acquisition projects. Evidence was found to be significant in firms that had CEOs who were twenty years older than

the other CEOs, especially when the older CEOs also had an impact on salary plans after the potential acquisitions. The effect was not significant when the firm was planning to take other investment projects that were not relevant with regard to the salaries. The study concluded that it is not accurate to link the CEO's age directly with the firm's strategy like in previous studies, which indicated that firms with younger CEOs are more likely to be acquired or older CEOs have less confidence to push acquisition projects. The firm's final decision and strategy depend more on the agency issues related to the effect brought by decision outcomes on salaries.

More recent studies indicate that the CEO's age can affect firm performance via the CEO's attitude towards investments. Xie (2015) employed a sample that contained Chinese listed firms for the period between 2002 and 2009. He focused on the effects of the CEO's age and whether the CEO is newly appointed. The findings suggest that CEO's age is negatively related to the investment of the firm, which means young CEOs are more likely to make investments. This was also found when the CEO was newly appointed. Under both circumstances, the CEOs generated higher efficiency from the investments. The research further analysed the evidence for different groups. The author defined the firms into state-owned firms and private firms by looking at their actual controller. The evidence showed that the CEO's age played a more important role in the firm's investment among state-owned firms, while the factor of whether the CEO was newly appointed or not was more important in private firms. The study concluded that the CEO's age and CEO turnover have a significant effect on the firm's investment and the efficiency of the investment.

A later study by Dang et al. (2017) investigated how the CEO's age affects firm performance by looking at the relationship between the CEO's age and

changes in the firm's ownership. They insisted that the CEO's age has an effect on the firm's corporate governance and consequences when the firm is taken over. They focused on a sample of firms in eight Asian countries. The evidence showed that the party who initiated the acquisition was more willing to choose the partial-control method to complete the acquisition when the related firm was run by an older CEO. This was especially found in the cases when the acquisition was initiated between a firm in a developing country and a party from a developed country. They also found that the CEO's age was negatively related to the expected equity ownership, which affects the firm's corporate governance performance. Hence, the researchers concluded that the CEO's demographics affect the firm's strategies and performance via the efficiency of corporate governance and agency issues.

More recently, Farag and Mallin (2018) focused on Chinese markets. They attempted to study the relationship between the CEO's heterogeneities and the firm's risk-taking level. They defined the CEO's heterogeneities as age, education level, gender, and other personal experience. Their research sample had eight hundred and ninety-two listed firms in Chinese markets. By employing the fixed effects model and GMM model, they discovered that making risky choices was found more for the CEOs who are younger, have a shorter term of office and a higher education level. The findings also suggested that the CEO's personal experience had a positive effect on risk-taking choices, and female CEOs were not taking fewer risks than male CEOs in the firms. They concluded that the firm's choice to take risks is also related to the ownership structure. When a firm has a higher level of state ownership, then it is more likely to take risks.

3.2.2 Education

It is widely accepted that human resource, especially leadership, has a great influence on corporate governance and firm performance. It is believed that better human resources and quality leadership bring better firm performance. However, very few studies show evidence in terms of the difference of leadership and how it affects firm performance since leadership is usually seen as the result of a firm's corporate governance environment together with its own characteristics.

As early as 1972, Lieberson and O'Connor (1972) investigated the influence of the changes in leadership on firms. They studied one hundred and sixty-seven firms over 20 years to examine how leadership changes affect the firm's performance measured by, e.g., the firm's turnover and profit. They investigated the data in different years and industries and found that these two factors had more effect on firm performance than the changes in leadership. They showed that the influence of leadership changes varies in different circumstances and firms. They also investigated the impact of industry variables on firm performance in specific circumstances when the impact of leadership changes was big or small.

Leadership has many aspects that can influence firm performance via different channels. Among the aspects, education and personal experience are the most mentioned and investigated factors.

Jalbert et al. (2002) investigated the importance of the school education of CEOs in big firms in the United States. They collected the education information of the CEOs in firms on the Forbes Top Eight-hundred salary list. Their research focused on the degree the CEOs have and the place where

they get these from. Their results from four hundred and sixty-three institutions showed that most CEOs had an undergraduate degree, and nearly 50% of them had a higher degree. Large firms had a preference for the education background of CEOs, and further analysis showed how the education of the CEOs was related to their salaries. However, the results showed that CEOs without an undergraduate or graduate degree have significantly higher salaries than CEOs who have such degrees. And the institutions where the CEOs obtained their degree have no impact on the CEOs' salaries neither. Finally, they investigated how education affects firm performance measured by return on assets and Tobin's Q, respectively. The evidence indicated that education level and the place where the CEOs got their degree do have an impact on firm performance.

Carpenter et al. (2001) were interested in how international experience affects the CEO's impact on firms, and their research indicated that the CEO's international experience had resource and capability values which can add up the value of the firm. They investigated multinational firms in the United States and showed evidence that those firms with internationally experienced CEOs had a better performance than others. Particularly, those firms perform better when their CEOs had other resource and abilities. In the end, the evidence showed that CEOs who have international experience have higher salaries than others.

A later study by Carpenter (2002) investigated further how the characteristics of the top management team affect firm performance. The author analysed the relationships between the managers' education, working history, the terms of their post, and firm performance. The evidence showed that such relationships depended on the managers' social background. Those characteristics had a positive effect on firm performance. But these positive

relationships were affected by the firm's global strategy and the terms of the managers' post. They found that the improvement in firm performance is bigger when the terms of the post of the managers were short. The study inspired further studies on how top managers' personal characteristics affect firm performance under different conditions.

At the same time, Storey (2002) investigated this question from another perspective showing how training affects firm performance. He looked into medium-sized firms in the United Kingdom and indicated that the improvement in firm performance brought by 'high-performance work practices' (HPWPs) in big US firms could hardly be found in medium-sized firms. He expanded the definitions and contents of education and training and found that some variables did improve the medium-sized firms' performance in some ways.

Storey (2004) argued that the problem is that small firms, unlike the medium and big firms, have even less ability to offer training to their staff and the management team. To compare firms in different countries, he investigated small firms in the United Kingdom, the United States, Canada, Finland, Germany, and Japan. He found that there was no clear evidence showing that training could improve firm performance in small firms. He explained the finding as a 'market' effect. This suggests that the choice made by small firms not to offer training is wise. The staff in such firms preferred public training as well. He also found little relationship between firm performance and the involvement in training. These findings suggest that not offering training in small firms is a wise choice. The research concluded that previous studies which blame the lack of training in small firms on the leaders' lack of knowledge of the benefit of training are misleading.

For a long time, scholars have thought that better-educated managers improve firm performance since better education brings better skills, talents, and innovation capability. Gottesman and Morey (2006a) focused on examining the relationship between the CEO's education and firm performance, particularly. Firstly, they examined CEO schools' reputation and firm performance. They employed the CEO's average entry marks into their undergraduate and post-graduate schools as the measurement of the school's reputation. They found that firms with CEOs from schools of high reputation perform no better than the firms with CEOs from schools of low reputation. In addition, they found no evidence that CEOs with an MBA degree or graduate from law school could bring any more benefits to the firms than others. They even found that firms with CEOs who have no MBA or law degrees performed faintly better. But they also indicated that CEOs who had graduated from high reputation schools had higher salaries than the others.

In the same year, Gottesman and Morey (2006b) published another paper focusing on mutual fund firms and try to find out the effect of management education on firm performance. They defined the education quality by the average of the entry mark of the Graduate Management Admission Test (GMAT) and the school's ranking. The level of education was found to have a significant effect on firm performance. The better the education they were in receipt of, the better the firm performed. They further found that firms with managers who graduated from the top thirty business schools performed significantly better than the rest. These firms also performed better than the firms whose managers had no master's degree. However, the findings suggested that other education elements such as the degree level (other master's degree and PhD) and CFA qualification had no effect on firm performance.

Similarly, Darmadi (2013) focused on the education level of the top management team and firm performance. He used a sample of one hundred and sixty public listed firms in Indonesia and measured the firms' performance by way of their Tobin's Q ratio and Return on Assets. Darmadi (2013) collected related data of all the board members and the CEOs of the firms. The information contained their education levels, degrees, and the reputation of their graduate schools. The findings showed some evidence that education mattered under some circumstances in affecting firm performance measured by Tobin's Q ratio or return on assets. CEOs with a degree from high-reputation schools in Indonesia helped their firms perform markedly better than the others.

Research and studies in many respects seem to suggest that better human capital is a factor that brings better firm performance; hence it is necessary and beneficial to invest in human resource. But investing in human resource is not quite like investing in other physical equipment: there is a time cost needed to build the improvement of human capital. Thus, the time cost and other uncertainty can sometimes cancel out the outcome and benefits.

Crook et al. (2011) gathered and analysed sixty-six papers on how human resource affects firm performance. Their findings suggest that human resource is significantly positively related to firm performance. They explained that some human capital is unique and non-transferable. This was especially the case when scholars employ operation variables to measure firm performance other than variables like profit growth. Their conclusions suggested that firms should invest in improving their human resource, especially their unique human capital.

Goll and Rasheed (2005) not only investigated the relationship between the characteristics of the management team and firm performance, but they also tried to figure out the impact of the talents of the management team and how rational they are when they make firm decisions. They suggest that characteristics of the management are the channel that affects how rational they are when they make firm decisions, while critical decision-making brings better firm performance. In the research, they first tried to test the effect of personal characteristics on the decision-making process. They employed age, post-term, and education as the measurements of personal characteristics and tested how these characteristics affected decision-making. The findings suggested that personal characteristics have a strong impact on the rationality of the managers when they make decisions while their talents play a mild role in affecting firm performance.

Ramachandran and Shah (1999) tried to investigate the indigenous and ethnic groups and the relation between these characteristics in the leadership and firm performance in the African private sector. The research investigated firms led by indigenous people and other ethnic groups like Asian people or Europeans. They controlled the size, age, industry, and other factors of different firms and found out that firms led by other ethnic groups perform significantly better than the firms owned by indigenous Africans. The start-up scale of the firms owned by other ethnic groups is also bigger than the indigenously-owned firms. They explained the phenomenon by suggesting that other ethnic groups are better at bringing capital and technology to their firms via their network. They also indicated that education plays an important role in helping indigenous Africans to run their firms better. Indigenous owners with secondary or higher degrees help their firms since education help them improve their skills and knowledge to reduce the gap between them and other ethnic owners.

Blundell et al. (1999) did a broad review of the effect of education and training. They investigated not only the effect of education on firms, but they also investigated the effect of education on personal income and the macroeconomy. They firstly reviewed the studies on education and personal income. They found that empirical studies try to avoid prospective biases when they investigate the impact of education on personal income. Then they turned to the other side of how education and training affect the firms. But very few empirical studies were found due to the absence of usable data and methodology. In the end, they investigated the effect of education on the economy at the macro level. Their conclusions led to 'growth accounting' and 'new growth' frameworks. A lot of evidence has been found that education boosts the growth of the macroeconomy.

However, many scholars argue that education has no significant influence on firm performance.

Dyke et al. (1992) firstly focused on the firm owner's experience and whether this affects firm performance. They defined seven kinds of experience and collected the data of the firms from five different industries. Their findings showed that industry, experience, and the establishment process have a positive effect on firm performance. But they found that the owner's personal experience and educational background have no significant relationship with firm performance. They also showed evidence that the owner-founder experience, whether the owner is the founder of the business or not, and whether the owner has partners have an effect on firm performance in some industries.

Some scholars have also tried to investigate this issue in more complicated cases and add more layers to the research.

Bhagat et al. (2010) tried to investigate how the Chief Executive Officer (CEO)'s education affects the firm and the position's replacement. They first investigated whether education is a key factor to consider when the firm chooses to change its CEO. Education background may be the reason that the old CEO is replaced and the reason that the new candidate is selected. The research employed a fourteen-year dataset, including more than two thousand replacement cases. The variables contained information like the education level of the CEO, the ranking of the CEO's college and postgraduate school, and whether the CEO had a master's degree, etc. The findings suggested that education background is not a significant factor influencing CEO churn. The old CEOs seemed to be replaced mainly due to their bad performance. But education was an important factor when the firms picked their new CEOs. The results also showed that education background had a positive effect on the firm's performance for a short period when the CEO has an MBA degree. But this impact does not exist in the long run. Thus, education background does not reflect the CEO's entire working performance, but it can be considered as an important factor when the firm chooses its CEO even though education does not have a significant influence on firm performance in the long run.

Ahn et al. (2009) looked specifically into whether the replacement of the CEO itself has an effect on firm performance in Japan. Ahn et al. (2009) pointed out that, unlike other countries in the West, Japan is a country that is advocating collectivism. They were concerned with the question of whether the CEO has a positive effect on firm performance under this circumstance.

They employed a dataset of 1,419 publicly listed firms in the manufacturing sector from 1990 to 2002. The dataset had 3,520 CEOs during the study period. The results show that the replacement of the CEO brought a positive effect on the stock returns of the firm when the replacement was published. This effect was even stronger if the replacement was not planned. Overall, the results indicated that the improvement in stock return brought by CEO replacement is a short-term effect. The findings showed no significant evidence that the effect on firm performance or firm policy was a long-term effect no matter whether the replacement was scheduled or non-scheduled. In the end, Ahn et al. (2009) tried to find out the impact of a CEO on his/her firm using the fixed-effect method. However, the evidence showed that there was no significant relationship between the CEO and firm performance. They concluded that the CEO does not have a significant positive effect on firm performance in Japan during the lost ten years.

3.2.3 Other Literature

There are many other ways that scholars have investigated the influencing factors in firm decisions and performance. Antia et al. (2010) investigated the relationship between the top management's short sight and firm value. They tried to measure a manager's sight when making decisions by looking at his or her term of office. They assume that the top managers' term of office will affect their decision potentially. Results indicated that a shorter term of office would result in higher 'agency cost' since the top managers will focus more on the benefits for themselves given their current term of office is short. A short term of office will let top managers use more direct methods to maximise their interest other than those of the firm. Thus, shorter terms of office will also lead to a reduced firm value and higher risk in the market.

They conclude that shorter terms of office will change the decisions that a top manager make towards new projects or investments. They will then tend to initiate projects with fast payments and consider less for the value in the long run.

Alves et al. (2016) examined the relationship between firm performance, corporate governance, and the CEO's salary. They employed a dataset of listed firms in Portugal and the study period was between 2002 and 2011. The evidence showed that influence firm influence was the most important factor for CEO salary. The influencing factors included the return for shareholders, shareholder features, and the firm's directors, etc. They further indicated that firm performance's influence is not significant. The effect of firm performance on CEO salary was as little as five per cent. The results showed that CEO features, shareholder features, and board structure were also influencing factors of the CEO's salary.

Chen et al. (2011) focused on corporate governance in China under a comprehensive set of conditions. They started with two theories and investigated them as they applied to the listed firms in China. For the first one, management power theory, they found that the top management's ownership and education significantly positively affected management pay. 'Political' power of the management was also related to the management pay, but the influence was not significant. They further defined the top management's position level in the firm as the top managers who were the top three highest-paid managers. The evidence showed that the manager's position level in a firm had a positive effect on management pay. But state ownership had a negative effect on management pay. Then they investigated the tournament theory and found that the number of top managers had no effect on management pay. Their findings showed that there is a positive

relationship between firm performance and the difference in payment among competitors.

O'connell and Cramer (2010) focused on Ireland's listed firms and looked into the effect brought by board features on firm performance. The evidence showed that board size had a significant negative effect on firm performance, which indicated that small boards are a better choice for the firm. However, this effect was less significant in firms with a smaller size themselves. They finally indicated that the number of non-executives on board is significantly positively related to firm performance. The research found no evidence that the board structure had any effect on firm performance.

To figure out the influencing factors in firm performance, Brown and Caylor (2004) developed a comprehensive measurement, Gov-score (G-indicator), to investigate which element matters most in corporate governance hence firm performance. The G-indicator contained fifty-one influencing factors under eight categories, including firm charters, directors' characteristics, education, salaries, firm ownership and others. They employed a dataset of two thousand three hundred and twenty-seven listed firms to find the relationship between the G-indicator and firm performance, firm value, and the pay-out to shareholders. A higher G-indicator represented better corporate governance. The evidence showed that a higher G-indicator was related to higher profit, higher firm value, and more dividend paid out to the shareholders. They then further analysed which element was most related to firm performance. They indicated that top managers' salaries have a positive relationship to firm performance while firm charters have a negative relationship to firm performance. Among the influencing factors mentioned by Brown and Caylor (2004), some were related to better firm performance but were rarely investigated in the past. They showed that the annual meeting

of the firm governance committee represented good corporate governance which led to better firm performance. A similar effect was also brought by a more independently nominated committee. However, they also found out that elements that lead to good corporate governance can sometimes cause worse firm performance, like the amount of the audit fees paid and the structure of the board. Compared to the 'G-Index' created by Gompers et al. (2003), they developed a more accurate set of metrics that connected more corporate governance influencing factors or elements to firm performance.

3.2.4 Conclusion

From the literature above, we find that scholars still cannot achieve an agreement on all the issues about the leaders' demographics and firm performance.

Many studies show that the leader's age and education have a positive relationship with firm performance. There are also many findings indicating that a female leader in a firm helps to improve firm performance better than male leaders. Generally, scholars point out that older leaders bring better performance for the firm based on their experience and risk-averse characteristic (Barker III and Mueller, 2002; Yim, 2013; Serfling, 2014; Xie, 2015). Some studies, like Dang et al. (2017), also insist that the leaders' ages have no relationship with firm performance. Regarding the gender of the leaders, Lam et al. (2013) show that female leaders have more chances and participate more in the firm's daily operations than they did before. Their evidence showed that female leaders improve the firm's performance (Nguyen et al., 2015; Adams and Ferreira, 2009). There is also evidence that shows that there is no relationship between the leader's gender and firm

performance (Ye et al., 2010). As to the education of the leaders, most scholars agree that better education in leaders brings better firm performance (Ramachandran and Shah, 1999; Jalbert et al., 2002; Carpenter, 2002). There are also studies that have found that the leader's education has no effect on firm performance (Dyke et al., 1992; Ahn et al., 2009; Bhagat et al., 2010; Gottesman and Morey, 2006a; Gottesman and Morey, 2006b).

However, we find that there are still very few research studies that have focused on this issue in the Chinese case. Some studies have tried to investigate the relationship between the leader's gender, age or education, and firm performance. But they have either used a small sample (e.g., private firms only), or the study period has been relatively short. Some studies have investigated similar topics, but they have not been able to focus on the direct relationship between the leader's demographics and firm performance. This essay will build hypotheses developed from this literature review, and its original contribution is derived from identifying where the gaps are in the existing research.

3.3 Hypotheses, Data and Methodology

3.3.1 Background of Leader's Demographics and Firm Performance

Facing extremely fierce competition, firms are finding their way to breakthrough by creating their advantages. Normally a firm's advantage is defined as the firm-specific resources. Now human capital, especially the leader's characteristics, are classified as valuable assets into the firm's competitive advantages.

In the beginning, the firm's leadership is investigated as a team. Hambrick and Mason (1984) investigated the top management teams in which people come from different educational backgrounds, different ages, and gender. They demonstrated that the characteristics of the top management teams are positively related to firm performance. A later study by Michel and Hambrick (1992) found that better heterogeneity of the leadership is positively linked to better firm performance.

China has integrated into the world economy successfully. During the development of the Chinese economy and firms, Chinese listed firms embarked on a more professional development path. Chinese listed firms are more in line with international standards in corporate governance and daily operations.

3.3.1.1 Women in Power

Women face challenges both at home and at work. With the development of the economy and society, women participant more in the management of listed firms. According to the statistics of the U.S. Bureau of Labour Statistics, listed firms have more and more female CEOs nowadays. Below is a graph showing the number of women as the CEO of listed firms in different stock indexes:

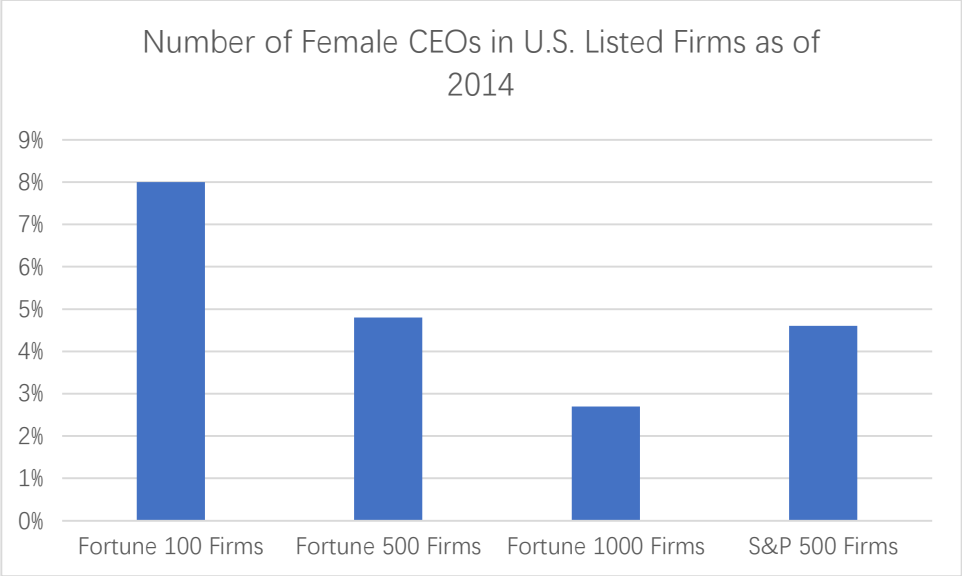


Figure 3-1 Number of Female CEOs in U.S. Listed Firms as of 2014

Fortune 100, Fortune 1000, S&P 500, and others are lists of companies and stock market indexes in the United States. They consist of panels of stocks with selected 100 firms, 1000 firms, and 500 firms, respectively. From the figure above, we observe that female CEOs account for 8% of the CEOs in Fortune 100 firms but only count for 2.7% in Fortune 1000 firms. The percentage of female CEOs is similar in Fortune 500 and the S&P 500, which are 4.8% and 4.6%, respectively. This shows that the percentage of female CEOs is the highest in Fortune 100 firms, among which are the largest firms like Amazon.

Compared with the listed firms in the US, we have the figure below showing the percentage of female board chairs and CEOs in Chinese listed firms in our sample during the whole study period:

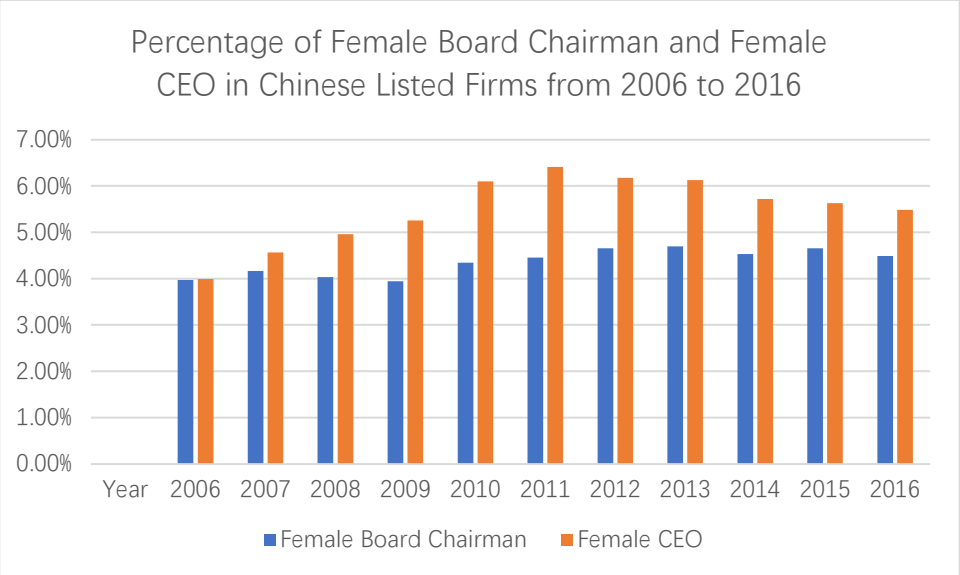


Figure 3-2 Percentage of Female Board Chair and Female CEO in Chinese Listed Firms from 2006 to 2016

From the figure above, we observe that the percentage of firms with female CEOs is higher than the percentage of female board chair in Chinese listed firms. According to our dataset, the average percentage of firms with female CEOs is 5.49% over the years, while for board chairs, the figure is 4.36%. The figure above shows that the highest percentage of firms with a female CEO was 6.41%, and the year with the lowest was 3.99%. The highest percentage of firms with a female board chair has been 4.70%, and the lowest percentage of firms with a female board chair has been 3.97%. The average levels of the percentages of female leaders in Chinese listed firms and the U.S. listed firms are similar. This means Chinese listed firms, unlike before, have more female leaders, and this is comparable to the international level.

3.3.1.2 Age of the Leaders

There is a famous saying in China that 'Age is Capital'. Most of the time, this sentence means being young is good, which means people still have time to pursue dreams. Some famous leaders become successful at their young ages, like Bill Gates. But most of the board chair and CEO in the listed firms are usually in their middle ages. Being young brings people time and chances, but knowledge and experience grow with age.

According to the U.S. Bureau of Labour Statistics, the average age of becoming a CEO in U.S. listed firms is 53 years old in 2013. In comparison, the average age of dropping out as the CEO is 63 years old. The age range roughly matches the average CEO tenure of 9.7 years in U.S. listed firms. Below is the figure of the average age of board chair and CEO in Chinese listed firms:

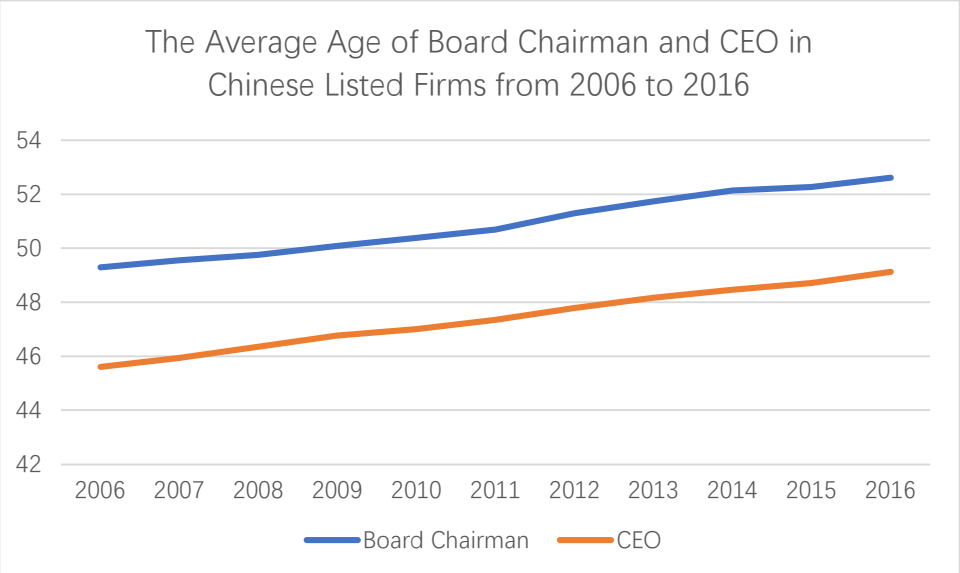


Figure 3-3 The Average Age of Board Chair and CEO in Chinese Listed Firms from 2006 to 2016

In our dataset, the overall average age of the board chair is 51.2 years old, while the average age of CEO is 47.6 years old in Chinese listed firms. From the figure above, we also observe that the average age of the board chair is older than the average age of the CEO, and both tend to grow over the study period. As of 2016, the average age of the board chair is 52.6 years old, while the average age of the CEO is 49.1 years old. These are slightly younger compared with the data of the U.S. listed firms. The trend shows that Chinese listed firms prefer older leaders over this study period.

3.3.1.3 Education Level of the Leaders

A famous maxim of Confucius is that 'People who are excellent in learning will make a government official (to further promote benevolence)'. However, most Chinese people in this generation understand this maxim as 'if you study really well you could then become an official or someone with great success'.

Though there is a misunderstanding of the accurate meaning of this maxim, it is a fact that Chinese people have placed a particular emphasis on learning since ancient times. Chinese people think that a good education is a fundamental base for success and advantages.

It is widely accepted that education is the driving force of technology and the development of our society. It also helps people to reach their career top. According to the data of the U.S. Bureau of Labour Statistics, 100% of the CEOs in Fortune 100 firms have a bachelor's degree. Among S&P 500 firms, 97% of the CEOs have a bachelor's degree. What is perhaps surprising is

that only 29% of the CEOs in Top 100 firms have an MBA degree in the United States.

Our data focusing on Chinese listed firms shows different circumstances regarding the education level of the leaders:

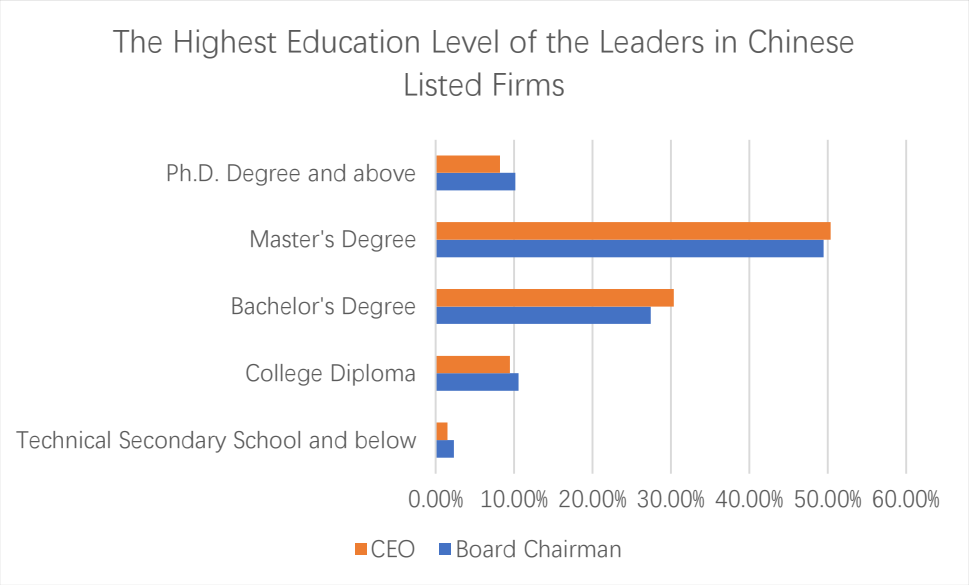


Figure 3-4 The Highest Education Level of the Leaders in Chinese Listed Firms

The figure shows the education level of the leaders in Chinese listed firms in the whole sample. Normally we have five education levels in China: PhD Degree and above, Master's Degree, Bachelor's Degree, College Diploma, and Technical Secondary School and below. We note the highest education level the leader obtained as his or her education level in our dataset.

The figure indicates that 49.48% of the board chair in Chinese listed firms have a master's degree, while 50.84% of the CEOs have a master's degree. The percentage of holding a PhD degree and above of the board chair is around 10% which is slightly higher than that of the CEOs. The overall education level of the leaders in Chinese listed firms is higher compared with

the U.S. listed firms based on the U.S. Labour Statistics above. We have a higher percentage of leaders holding a master's degree and above.

3.3.2 Hypotheses

From the background discussions above, we have had a comprehensive view of the demographics of the leaders in Chinese listed firms. Combined with the discussion of the literature review in part two, this essay aims to find out the relationships between the leader's demographics and firm performance in Chinese markets. The main hypotheses are listed as follows.

Firstly, we expect that female leaders boost firm performance. Studies in the literature show that female top managers participate more in the firm's daily operations and meetings (Lam et al., 2013; Adams and Ferreira, 2009). Other studies show that female leaders improve the firm's performance (Nguyen et al., 2015; Adams and Ferreira, 2009). Evidence implies that female leaders tend to improve the efficiency of corporate governance and firm performance since they are 1) easier to comply with rules than male leaders; 2) biologically more attentive and showing more patience than males generally, and 3) tend to spend more time before launching a project or plan to prepare for a better strategy to avoid risks and lower the probability of failure.

Hence, for the relationship between the leader's gender and firm performance, we expect:

H1. For all listed firms, female leaders improve firm performance.

Secondly, we expect that the leader's age is positively related to firm performance. Generally, scholars point out that older leaders bring better performance for the firm based on their experience and risk-averse characteristic (Barker III and Mueller, 2002; Yim, 2013; Serfling, 2014; Xie, 2015). As mentioned in the literature review, older leaders tend to have more cash flow, less risky projects, and less risky investment in the firms (Serfling, 2014; Orens and Reheul, 2013; Xie, 2015), which have effects on firm performance. Thus, firms with older leaders tend to have less stock price fluctuation and better firm performance. This is because young and senior managers have different attitudes and preferences towards firm strategies. Senior leaders have gain experience and knowledge through their careers. They tend to build strategies that allow lower risks to avoid potential loss. What is more, young leaders are more eager and 'urgent' to make contributions to the firms so that they can ensure their position and improve their financial compensations. Thus, young leaders tend to allow more risk in the firm's daily operations, which brings more fluctuations and potential poor performance of the firm.

Thus, for the relationship between the leader's age and firm performance, we expect:

H2. For all listed firms, the age of the leaders is positively related to firm performance.

As to the education level of the leaders, we expect that better education brings better firm performance. Based on the discussion in the literature review, we find that better education brings knowledge, skills, and talents of the leaders that they can convert into the firms (Jalbert et al., 2002; Carpenter, 2002; Gottesman and Morey, 2006a; Gottesman and Morey, 2006b; Darmadi,

2013). The education level of the leaders has a strong effect on firm performance since education widens the horizon and enhances the knowledge of the leaders, and makes their advantage of competing with other leaders. Hence, leaders with better education improve firm performance. Education also makes the leaders more likely to become professionals in their areas, which helps them make better choices facing changes and competitions in daily operations. A higher education degree is more likely to distinguish a leader from the other in terms of knowledge and ability.

Thus, for the relation between the leader's education level and firm performance, we expect:

H3. For all listed firms, the education level of the leaders is positively related to firm performance.

3.3.3 Data and Sample

3.3.3.1 Data Statistics and Variable Definitions

The sample of this essay contains all the listed firms in the Chinese stock markets from 2006 to 2016. The study period is eleven years. During the study period, we have 3,222 Chinese listed firms and 25,572 observations in total. The panel of this sample is unbalanced since there are firms listed or delisted during this period that we have different observation scales in each year.

This essay investigates the relationship between the leader's demographics and firm performance in all Chinese listed firms. Tobin's Q ratio is employed

as the measurement of firm performance. We employ the leader's gender, age, and education level as the measurements of the demographics. The control variables include leverage, growth, firm size, board independence, and management shares. Below is the table showing the descriptions and definitions of the variables:

Table 3-1 Definitions of Variables

	Variable Name	Definition/Measurement
Dependent Variable	Firm Performance (FP)	Tobin's Q ratio, which equals the market value of a firm to its replacement cost.
Main Variables	Board Chair's Gender (BFE)	Dummy variable that equals one if the board chair is female; and zero otherwise.
	Board Chair's Age (BA)	The board chair's age.
	Board Chair's Education Level	Dummy variables showing the board chair's highest education degree level, including BE1 to BE5.
	BE1	equals one if the board chair's highest degree is a technical secondary school and below, and zero otherwise.
	BE2	equals one if the highest degree is a college diploma, and zero otherwise.
	BE3	equals one if the highest degree is a bachelor's degree, and zero otherwise.
	BE4	equals one if the highest degree is a master's degree, and zero otherwise.
	BE5	equals one if the highest degree is a PhD degree and above, and zero otherwise.
	CEO's Gender (CFE)	Dummy variable that equals one if the CEO is female; and zero otherwise.
	CEO's Age (CA)	The CEO's age.
	CEO's Education Level	Dummy variables showing the CEO's highest education degree level, including CE1 to CE5.
	CE1	equals one if the board chair's highest degree is a technical secondary school and below, and zero otherwise.
	CE2	equals one if the highest degree is a college diploma, and zero otherwise.

	Variable Name	Definition/Measurement
	CE3	equals one if the highest degree is a bachelor's degree, and zero otherwise.
	CE4	equals one if the highest degree is a master's degree, and zero otherwise.
	CE5	equals one if the highest degree is a PhD degree and above, and zero otherwise.
Control Variables	Leverage (LE)	Measured by the ratio of total liabilities to total assets of the firm.
	Growth (GRO)	Measured and calculated as (observation year's total assets - previous year's total assets)/ previous year's total assets.
	Firm Size (SIZE)	Natural logarithm of the total assets of the firm.
	Board Independence (INDE)	The number of independent directors on the board.
	Management Shares (MS)	Natural logarithm of the shares owned by the management.

Further, prior to estimating the models, we make a table of the descriptive statistics and correlation coefficient check of the dataset. The correlation coefficient matrix result is attached in the Appendix showing no particularly high and significant relationships in-between the variables. Below are the summary statistics for the variables:

Table 3-2 Variable Descriptive Statistics

Variables	Observations	Mean	Std. Dev.	Min	Max
Tobin's Q	24,982	2.274562	2.279674	0.032362	13.29931
Board Chair's Age	23,883	51.14672	7.149802	21	84
CEO's Age	23,813	47.63125	6.499787	21	79
Leverage	24,165	0.467446	0.241932	0.046542	1.368867
Growth	22,237	0.154092	0.290292	-0.4723	1.688231
Firm Size	25,511	21.86288	1.419908	18.78401	26.79644
Board Independence	24,017	3.258942	0.687177	0	8
Management Shares	17,092	14.23075	3.883933	0	21.93036

The above table shows the summary statistics of all the non-dummy variables. This dataset contains all the Chinese listed firms starting with stock code 000001 and ending at stock code 900957. The table also shows statistical features of the variables, including the mean, standard deviations, minimum and maximum value of the variables. For instance, we observe that the CEO's age varies between 21 and 79, which means the youngest CEO in this dataset is 21 years old while the oldest is 79 years old.

Since the variables of leader's age and education are dummy variables with values equal to one and zero, for the dummy variables in this dataset, two tables are provided below.

Table 3- 3 Statistics of Female Board Chair and Female CEOs

Year	Number of Female Board Chair	Percentage	Number of Female CEO	Percentage
2006	1281	3.97%	1348	3.99%
2007	1451	4.16%	1464	4.56%
2008	1523	4.03%	1515	4.96%
2009	1681	3.94%	1659	5.25%
2010	2025	4.35%	1971	6.10%
2011	2254	4.45%	2190	6.41%
2012	2376	4.65%	2323	6.18%
2013	2415	4.70%	2360	6.13%
2014	2527	4.53%	2474	5.72%
2015	2703	4.66%	2648	5.63%
2016	2596	4.49%	2534	5.48%
Total	1055	4.42%	1337	5.61%

Table 3- 4 Statistics of the Board Chair's Education Level

Year	Level 1	Level 2	Level 3	Level 4	Level 5
2006	1.55%	12.84%	31.86%	44.93%	8.82%
2007	1.57%	11.44%	31.61%	45.78%	9.60%
2008	1.49%	10.65%	29.94%	47.99%	9.94%
2009	1.65%	10.26%	28.71%	48.53%	10.85%
2010	2.01%	10.44%	27.39%	49.88%	10.29%
2011	2.07%	11.34%	27.01%	49.78%	9.80%
2012	2.55%	10.96%	26.47%	49.90%	10.12%
2013	2.47%	10.45%	26.04%	50.93%	10.12%
2014	2.73%	10.08%	26.25%	50.71%	10.24%
2015	3.03%	9.77%	26.05%	50.59%	10.55%
2016	3.17%	9.55%	25.90%	50.72%	10.63%
Total	2.34%	10.56%	27.45%	49.48%	10.16%

*for table 3-4, education level 1-5 refers to the definitions below:

Education Level 1: The highest degree of the leader is a technical secondary school and below;
Education Level 2: The highest degree of the leader is a college diploma;
Education Level 3: The highest degree of the leader is a bachelor's degree;
Education Level 4: The highest degree of the leader is a master's degree;
Education Level 5: The highest degree of the leader is a PhD degree and above.

Table 3- 5 Statistics of CEO's Education Level

Year	Level 1	Level 2	Level 3	Level 4	Level 5
2006	1.31%	12.26%	32.19%	47.74%	6.50%
2007	1.34%	10.39%	31.17%	50.07%	7.04%
2008	1.03%	10.04%	30.76%	50.06%	8.11%
2009	0.88%	9.94%	30.41%	50.53%	8.25%
2010	1.17%	10.06%	30.86%	49.61%	8.30%
2011	1.36%	9.79%	29.63%	50.70%	8.52%
2012	1.53%	9.15%	29.90%	50.43%	8.99%
2013	1.72%	9.29%	29.96%	50.84%	8.19%
2014	1.73%	8.60%	30.31%	51.32%	8.05%
2015	1.95%	8.54%	29.95%	50.99%	8.57%
2016	2.00%	8.32%	30.55%	50.54%	8.59%
Total	1.52%	9.46%	30.40%	50.40%	8.21%

*for table 3-5, education level 1-5 refers to the definitions below:

Education Level 1: The highest degree of the leader is a technical secondary school and below;
Education Level 2: The highest degree of the leader is a college diploma;
Education Level 3: The highest degree of the leader is a bachelor's degree;
Education Level 4: The highest degree of the leader is a master's degree;
Education Level 5: The highest degree of the leader is a PhD degree and above.

Based on the summary statistics shown in table 3-3, table 3-4, and table 3-5, the percentage of firms with a female CEO is higher than the percentage of firms with a female board chair in Chinese listed firms. The average percentage of female CEO is 5.49% over the years, while the average percentage of female board chair is 4.36%. Regarding the leader's age, the overall average age of the board chair is 51.2, while the average age of the CEO is 47.6 in Chinese listed firms. The average age of the board chair is older than the average age of the CEO, and both tend to grow over the study period. As to the education level of the leaders, 49.48% of the board chair in Chinese listed firms have a master's degree while 50.84% of the CEOs have a master's degree. The education level of the leaders is of a high standard compared with the level in the United States.

3.3.3.2 Data Description

This essay investigates all the listed firms in the Chinese stock markets. We employ all the listed firms from 2006 to 2016. The main part of the data is from the CSMAR database, which includes all the information from the firm's balance sheet and other financial reports.

However, due to the lack of compulsory regulations from the China Securities Regulatory Commission, part of the information regarding the

leader's education level is not available in CSMAR. CSMAR defines five education levels for the leaders in Chinese listed firms. The education levels range from level 1 to level 5, which are:

Education Level 1: The highest degree of the leader is a technical secondary school and below;
Education Level 2: The highest degree of the leader is a college diploma;
Education Level 3: The highest degree of the leader is a bachelor's degree;
Education Level 4: The highest degree of the leader is a master's degree;
Education Level 5: The highest degree of the leader is a PhD degree and above.

Thus, for all the missing information, we manually collected the data from the listed firm's annual report and other official financial websites (such as Bloomberg.com, Yahoo Finance, Finance iFeng, etc.). We noted the leader's education level as the most recent and the highest level that the websites showed for him or her.

3.3.4 Methodology and Models

Based on the discussion in the literature review in part two, we observe that the methodology employed in each research largely depends on the feature of the dataset.

There are mainly three kinds of methodology: cross-sectional methodology, time series methodology, and panel data methodology. Among which panel data methodology is used for a dataset that contains multiple observations observed over multiple periods. Panel data methodology is similar to the

combination of cross-sectional methodology and time-series methodology that observe the same firm over time.

Thus, panel data methodology has the advantage that it shows multiple features of the sample from multiple aspects over time in a relatively long period. It reduces the errors to a minimum level while obtains better results than a single cross-sectional analyse. This essay employs panel data methodology and builds the related models below to investigate hypotheses **H1** to **H3**:

$$FP_{it} = \beta_1 + \beta_2 BFE_{it} + \beta_3 BAG_{it} + \beta_4 LE_{it} + \beta_5 GRO_{it} + \beta_6 SIZE_{it} + \beta_7 INDE_{it} + \beta_8 MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [1]$$

In Equation [1] above, FP_{it} is the firm performance measured by Tobin's Q ratio. BFE_{it} BAG_{it} LE_{it} MS_{it} $SIZE_{it}$ GRO_{it} and $INDE_{it}$ are the matrixes of the factors that influence firm performance. They stand for the board chair's gender, the board chair's age, leverage, management shares, firm size, growth, and board independence, respectively. Besides, β_1 is the intercept and ε_{it} is the disturbance term. μ_i is for the time-invariant effects that make an individual different from the others.

$$FP_{it} = \beta_1 + \beta_2 CFE_{it} + \beta_3 CAG_{it} + \beta_4 LE_{it} + \beta_5 GRO_{it} + \beta_6 SIZE_{it} + \beta_7 INDE_{it} + \beta_8 MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [2]$$

In Equation [2] above, FP_{it} is the firm performance measured by Tobin's Q ratio. CFE_{it} CAG_{it} LE_{it} MS_{it} $SIZE_{it}$ GRO_{it} and $INDE_{it}$ are the matrixes

of the factors that influence firm performance. They stand for the CEO's gender, the CEO's age, leverage, management shares, firm size, growth, and board independence, respectively. Besides, β_1 is the intercept and ε_{it} is the disturbance term. μ_i is for the time-invariant effects that make an individual different from the others.

$$FP_{it} = \beta_1 + \beta_2 BE1_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [3]$$

$$FP_{it} = \beta_1 + \beta_2 BE2_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [4]$$

$$FP_{it} = \beta_1 + \beta_2 BE3_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [5]$$

$$FP_{it} = \beta_1 + \beta_2 BE4_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [6]$$

$$FP_{it} = \beta_1 + \beta_2 BE5_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [7]$$

In Equation [3] to [7] above, FP_{it} is the firm performance measured by Tobin's Q ratio. $BE1_{it}$ to $BE5_{it}$ stand for the education level of the board chair from level 1 to level 5. LE_{it} MS_{it} $SIZE_{it}$ GRO_{it} and $INDE_{it}$ are the matrixes of the factors that influence firm performance. They stand for leverage, management shares, firm size, growth, and board independence, respectively. Besides, β_1 is the intercept and ε_{it} is the disturbance term. μ_i is for the time-invariant effects that make an individual different from the

others.

$$FP_{it} = \beta_1 + \beta_2 CE1_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it};\quad i = 1, \dots N; t = 1, \dots T \quad [8]$$

$$FP_{it} = \beta_1 + \beta_2 CE2_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it};\quad i = 1, \dots N; t = 1, \dots T \quad [9]$$

$$FP_{it} = \beta_1 + \beta_2 CE3_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it};\quad i = 1, \dots N; t = 1, \dots T \quad [10]$$

$$FP_{it} = \beta_1 + \beta_2 CE4_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it};\quad i = 1, \dots N; t = 1, \dots T \quad [11]$$

$$FP_{it} = \beta_1 + \beta_2 CE5_{it} + \beta_3 LE_{it} + \beta_4 GRO_{it} + \beta_5 SIZE_{it} + \beta_6 INDE_{it} + \beta_7 MS_{it} + \mu_i + \varepsilon_{it};\quad i = 1, \dots N; t = 1, \dots T \quad [12]$$

In Equation [8] to [12] above, FP_{it} is the firm performance measured by Tobin's Q ratio. $CE1_{it}$ to $CE5_{it}$ stand for the education level of the CEO from level 1 to level 5. LE_{it} MS_{it} $SIZE_{it}$ GRO_{it} and $INDE_{it}$ are the matrixes of the factors that influence firm performance. They stand for the CEO's gender, the CEO's age, leverage, management shares, firm size, growth, and board independence, respectively. Besides, β_1 is the intercept and ε_{it} is the disturbance term. μ_i is for the time-invariant effects that make an individual different from the others.

3.4 Empirical Results

3.4.1 Data Process

In this essay, we use the STATA software to prepare the data and carry out all the modelling estimation in the empirical analysis. We firstly run the OLS (Ordinary Least Squares) regression and the Estimation of the Random Effects for Equation [1] and [2]. The results are showing below:

Table 3-6 OLS Regression Results for Equation [1] and [2]

	Equation [1]	Equation [2]
VARIABLES	Tobin's q	Tobin's q
Board Chair's Gender	0.129**	
	(0.0640)	
Board Chair's Age	-0.000650	
	(0.00190)	
CEO's Gender		0.0603
		(0.0572)
CEO's Age		0.00686***
		(0.00208)
Leverage	-1.232***	-1.274***
	(0.0607)	(0.0607)
Growth	0.573***	0.600***
	(0.0472)	(0.0473)
Size	-0.781***	-0.777***
	(0.0111)	(0.0110)
Board Independence	-0.0926***	-0.0837***
	(0.0207)	(0.0207)
Management Shares	0.000431***	0.000448***
	(8.05e-05)	(8.03e-05)
Constant	19.67***	19.28***
	(0.222)	(0.225)
Observations	20,795	20,649
R-squared	0.285	0.285

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-7 Random Effects Results for Equation [1] and [2]

VARIABLES	Equation [1] Tobin's q	Equation [2] Tobin's q
Board Chair's Gender	0.243***	
	(0.0783)	
Board Chair's Age	0.00896***	
	(0.00226)	
CEO's Gender		0.0224
		(0.0658)
CEO's Age		0.0123***
		(0.00230)
Leverage	-0.923***	-0.954***
	(0.0774)	(0.0775)
Growth	0.385***	0.389***
	(0.0402)	(0.0403)
Size	-0.825***	-0.824***
	(0.0153)	(0.0152)
Board Independence	-0.0707***	-0.0774***
	(0.0260)	(0.0260)
Management Shares	0.000154**	0.000165**
	(6.57e-05)	(6.56e-05)
Constant	20.68***	20.56***
	(0.323)	(0.323)
Observations	20,795	20,649
Number of id	2,857	2,855

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From the results above, we observe that OLS and the estimation of the random effects offer different results for the equations. OLS estimation shows that both female board chair and female CEO have a positive effect on firm performance, among which the effect of female board chair is significant. The age of the board chair has a negative effect on firm performance, while the age of the CEO has a significant positive effect on

firm performance, which indicates that older leaders bring better firm performance. The estimation of the random effects shows similar results. One of the differences is that in the results of the estimation of the random effects, the effect of the female board chair's significance is higher than that of the OLS result that reaches the 1% level rated three-star.

To choose between OLS estimation and the estimation of the random effects, we run a Breusch and Pagan Test right after each estimation of the random effects.

Table 3-8 Breusch and Pagan Test for Equation [1]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.006618	2.237547
	e	2.173416	1.474251
	u	1.662633	1.289431
Test: **Var(u) = 0**			
		chibar2(01) =	10074.45
		Prob > chibar2 =	0.0000

Table 3-9 Breusch and Pagan Test for Equation [2]

Breusch and Pagan Lagrangian Multiplier Test for Random effects		
tobin[id,t] = Xb + u[id] + e[id,t]		
Estimated results:		
	Var	sd = sqrt(Var)
q	10074.45	10074.45
e	10074.45	10074.45
u	10074.45	10074.45
Test: Var(u) = 0		
	chibar2(01) =	9716.46
	Prob > chibar2 =	0.0000

From the results of the Breusch and Pagan Tests, we observe that all the results indicate that p-value=0. These results reject the null hypothesis of no random effects. Thus, OLS would have been inefficient. To further estimate, we proceed to the fixed effects models and employ the Hausman Test to find out which one is most suitable for the estimation.

Table 3-10 Hausman Test Results for Equation [1]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
bfe	0.275863	0.243446	0.032417	0.048168
bage	0.01299	0.008962	0.004028	0.001335
lev	-0.53116	-0.92259	0.391431	0.051
gro	0.324017	0.384979	-0.06096	0.010774

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
size	-0.82913	-0.82483	-0.0043	0.012721
inde	-0.14227	-0.07075	-0.07152	0.016554
ms	0.000104	0.000155	-5.1E-05	7.71E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 192.78

Prob>chi2 = 0.0000

Table 3-11 Hausman Test Results for Equation [2]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
cfe	0.010983	0.022449	-0.01147	0.036174
cage	0.012699	0.012315	0.000384	0.001145
lev	-0.5542	-0.95389	0.399692	0.051689
gro	0.321477	0.389393	-0.06792	0.010996
size	-0.82386	-0.82354	-0.00032	0.012811
inde	-0.1481	-0.07739	-0.07071	0.016644
ms	0.000111	0.000165	-5.4E-05	7.79E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test:	**Ho:**	**difference in coefficients not systematic**
	chi2(7) =	(b-B) ' [(V_b-V_B)^(-1)](b-B)
	=	189.32
	Prob>chi2 =	0.0000

Based on the table above, we observe that the P-values of both tests for each equation are zero. This means the results reject the random effects models in favour of the fixed effects models. Our further analysis then focuses on the results from the estimation of the fixed effects. Similar tests were made on Equation [3] to [12]; the results indicate that the fixed effects model is most suitable for the estimations. The related test results and tables are attached in the Appendix.

3.4.2 Empirical Results

Employing the estimation of the fixed effects on all equations, we obtain three tables below for the results. All the re-write equations are attached in the Appendix.

Table 3-12 Fixed Effects Estimation Results for Equation [1] and [2]

	Equation [1]	Equation [2]
VARIABLES	Tobin's q	Tobin's q
Board Chair's Gender	0.276***	
	(0.0919)	
Board Chair's Age	0.0130***	
	(0.00263)	
CEO's Gender		0.0110
		(0.0751)
CEO's Age		0.0127***
		(0.00257)
Leverage	-0.531***	-0.554***
	(0.0927)	(0.0931)
Growth	0.324***	0.321***
	(0.0417)	(0.0418)
Size	-0.829***	-0.824***
	(0.0199)	(0.0199)
Board Independence	-0.142***	-0.148***
	(0.0308)	(0.0309)
Management Shares	0.000104*	0.000111*
	(6.62e-05)	(6.61e-05)
Constant	20.50***	20.49***
	(0.438)	(0.438)
Observations	20,795	20,649
R-squared	0.273	0.274
Number of id	2,857	2,855

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-13 Fixed Effects Estimation Results for Equation [3] to [7]

VARIABLES	Equation [3] Tobin's q	Equation [4] Tobin's q	Equation [5] Tobin's q	Equation [6] Tobin's q	Equation [7] Tobin's q
Board Chair Education Level 1	0.292				
	(0.179)				
Board Chair Education Level 2		-0.282***			
		(0.0726)			
Board Chair Education Level 3			-0.0153		
			(0.0429)		
Board Chair Education Level 4				-0.0551	
				(0.0380)	
Board Chair Education Level 5					0.175***
					(0.0633)
Leverage	-0.538***	-0.537***	-0.543***	-0.542***	-0.540***
	(0.0919)	(0.0918)	(0.0918)	(0.0918)	(0.0918)
Growth	0.303***	0.308***	0.305***	0.303***	0.306***

VARIABLES	Equation [3] Tobin's q	Equation [4] Tobin's q	Equation [5] Tobin's q	Equation [6] Tobin's q	Equation [7] Tobin's q
	(0.0414)	(0.0414)	(0.0414)	(0.0414)	(0.0414)
Size	-0.811***	-0.817***	-0.811***	-0.808***	-0.813***
	(0.0193)	(0.0194)	(0.0194)	(0.0194)	(0.0193)
Board Independence	-0.140***	-0.136***	-0.140***	-0.141***	-0.141***
	(0.0306)	(0.0306)	(0.0306)	(0.0306)	(0.0306)
Management Shares	0.000113*	0.000111*	0.000111*	0.000111*	0.000111*
	(6.62e-05)	(6.62e-05)	(6.62e-05)	(6.62e-05)	(6.62e-05)
Constant	20.79***	20.93***	20.79***	20.76***	20.82***
	(0.432)	(0.433)	(0.433)	(0.432)	(0.432)
Observations	20,933	20,933	20,933	20,933	20,933
R-squared	0.275	0.277	0.275	0.276	0.277
Number of id	2,858	2,858	2,858	2,858	2,858

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-14 Fixed Effects Estimation Results for Equation [8] to [12]

VARIABLES	Equation [8] Tobin's q	Equation [9] Tobin's q	Equation [10] Tobin's q	Equation [11] Tobin's q	Equation [12] Tobin's q
CEO Education Level 1	0.257				
	(0.161)				
CEO Education Level 2		-0.214***			
		(0.0640)			
CEO Education Level 3			-0.0611		
			(0.0372)		
CEO Education Level 4				0.0240	
				(0.0344)	
CEO Education Level 5					0.169***
					(0.0644)
Leverage	-0.539***	-0.538***	-0.542***	-0.542***	-0.540***
	(0.0918)	(0.0918)	(0.0918)	(0.0918)	(0.0918)
Growth	0.305***	0.307***	0.305***	0.305***	0.304***

VARIABLES	Equation [8] Tobin's q	Equation [9] Tobin's q	Equation [10] Tobin's q	Equation [11] Tobin's q	Equation [12] Tobin's q
	(0.0414)	(0.0414)	(0.0414)	(0.0414)	(0.0414)
Size	-0.811***	-0.816***	-0.811***	-0.811***	-0.812***
	(0.0193)	(0.0194)	(0.0193)	(0.0193)	(0.0193)
Board Independence	-0.139***	-0.138***	-0.140***	-0.140***	-0.140***
	(0.0306)	(0.0306)	(0.0306)	(0.0306)	(0.0306)
Management Shares	0.000111*	0.000111*	0.000110*	0.000110*	0.000111*
	(6.62e-05)	(6.62e-05)	(6.62e-05)	(6.62e-05)	(6.62e-05)
Constant	20.78***	20.90***	20.81***	20.78***	20.80***
	(0.432)	(0.433)	(0.432)	(0.432)	(0.432)
Observations	20,933	20,933	20,933	20,933	20,933
R-squared	0.275	0.278	0.276	0.275	0.277
Number of id	2,858	2,858	2,858	2,858	2,858

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The Leader's Gender and Firm Performance

Our hypothesis **H1** expects that female leaders boost firm performance. We employed a dummy variable that equals one if the leader is female and zeroes otherwise. The result shows that both female board chair and female CEO have a positive effect on firm performance in which the effect of female board chair is at the highest 1% level.

The finding shows a significant positive relationship between the female board chair and firm performance and that the effect of the female board chair is significant at the highest 1% level with a p-value<0.01. The result suggests that having a female board chair improves the firm's performance by 27.6% on average. This finding is in line with Lam et al. (2013), Nguyen et al. (2015), Adams and Ferreira (2009), etc.

The first reason for this finding is that women and men have different behaviour patterns in their daily life and different biological habits when making choices. Biologically, men tend to be more aggressive, while women tend to be more risk-averse. This has been demonstrated by the different household investment strategies made by men and women by Jianakoplos and Bernasek (1998).

In a listed firm, this biological habit also influences firm performance since female and male leaders are making choices every day on projects and investments. In this way, male leaders are more likely to choose risky projects and make aggressive investments. Female leaders are more likely to stay safe and consider the risk and return on certain investment strategies. Moreover, it is usually a fact that men spend less time when making choices which makes them thoughtless and fail to consider under a comprehensive

view to avoid losses. Women tend to be more attentive and thoughtful, which helps them reduce the risk to a lower level. Together, behaviour features and biological habits make female leaders make less risky strategies that bring better firm performance.

Secondly, it is easier for female leaders to comply with rules than male leaders. Literature has shown that the attendance of female top managers for meetings is significantly higher than male top managers (Adams and Ferreira, 2009). If the female leader has good habits in complying with rules, then it is easier for them to request the whole team to do the same. In this way, female leaders improve the efficiency of corporate governance and firm performance.

Furthermore, females are biologically more attentive and showing more patience than males generally. They tend to spend more time before launching a project or plan to prepare for a better strategy to avoid risks and lower the probability of failure. They will also pass on the habits and set the same requirements for their subordinate via corporate governance to improve firm performance. Compared with male leaders, female leaders are considered less likely to be overconfident. This will further reduce the potential risks of their decision and strategy for the listed firm.

The results also document that a female CEO has no significant influence on bringing about better firm performance though the pattern is also positive. This may be due to the situation that the board chair normally has more power than the CEO in Chinese listed firms over general corporate governance, which reduces the influence of the CEO.

The Leader's Age and Firm Performance

Our hypothesis **H2** expects that the leader's age has a positive relationship with firm performance, which is that older leaders bring better firm performance. The results document a significant positive relationship between the leader's age and firm performance for both the board chair's age and the CEO's age.

The findings suggest that both the effects of the board chair's age and the CEO's age are significant at the highest 1% level (rated three-star). One unit increase of the board chair's age improves the firm's performance by 1.3%, while one unit increase of the CEO's age improves the firm's performance by 1.27%. The findings support the hypothesis that older firm leaders bring better firm performance.

There are several aspects from which we investigate the relationship between the leader's age and firm performance. Generally, young and senior managers have different attitudes and preferences towards firm strategies. Senior leaders bring better firm performance, and less risk is in line with the results from Barker III and Mueller (2002), Yim (2013), Serfling (2014), Xie (2015), etc. Young leaders tend to issue more risky investments and projects, while older leaders tend to keep low risks on the firm's daily operations.

The difference comes from the different motivations of young and senior leaders. First, young leaders are at the beginning of the leading career roles. They are more confident to make quick outcome for the firms. Hence, they are more likely to allow higher risks. However, senior leaders have gain experience and knowledge through their careers. They tend to build strategies that allow lower risks to avoid potential loss.

Secondly, the behaviour and choices made by young and senior leaders are partly driven by their personal interests. Young leaders usually have less knowledge and working experience, that their position is not likely to be stable compared with old leaders. Also, in this way, young leaders tend to earn less than experienced old leaders. It is more eager and 'urgent' for young leaders to make contributions to the firms so that they can ensure their position and improve their financial compensations. Thus, young leaders tend to allow more risk in the firm's daily operations, which brings more fluctuations and potential poor performance of the firm.

At last, the strategies and choices made by young and old leaders are due to the features of their career path. As we mentioned, young leaders are usually at the beginning of the leading career roles. They have more aggressive passions to test their management philosophy and lower trial cost for their decisions. Old leaders prefer to remain stable in their career path since this is beneficial for them to keep their current personal and firm interests.

Interaction Effect between the Leader's Gender and Age

To further investigate the potential interaction effect that may exist between the leader's gender and age, we employ estimations to see how the interaction effects affect firm performance. Below are the tables of the results for the interaction effects between the board chair's gender and age, and the CEO's gender and age, respectively:

Table 3-15 Age x Gender (Board Chair)

Age x Gender	**Coef.**	**P-value**
Age x Female	0.0174	0.0000
Age x Male	0.0126	0.0000

Table 3-16 Age x Gender (CEO)

Age x Gender	**Coef.**	**P-value**
Age x Female	0.0128	0.0000
Age x Male	0.0127	0.0000

*Leverage, growth, firm size, board independence, and management shares are also controlled in the estimations.

From the tables above, we observe that all the patterns show significant positive effects on the firm performance to the highest 1% level, which is in line with our main results. For the gender variables, we define the variable equals one if the leader is female and zeros otherwise. For the age variables, they are both continuous variables equal to the age of the leaders.

Between the board chair's gender and age, we document that age significantly positively related to firm performance no matter the leader is male or female. When the leader is female, one unit increase of the board chair's age improves the firm's performance by 1.74%. When the leader is male, one unit increase of the board chair's age improves the firm's performance by 1.26%. Between the CEO's gender and age, we also document that the CEO's age significantly positively related to firm performance no matter the CEO is male or female. When the CEO is female, one unit increase of the CEO's age improves the firm's performance by 1.28%. When the CEO is male, one unit increase of the CEO's age improves the firm's performance by 1.27%. The results show that for both the board

chair and the CEO, the effect of female leaders is higher than that of male leaders. This supports our findings that female leaders are better to improve firm performance. It is evident that senior leaders help to increase firm performance in Chinese listed firms.

The Education Level of the Leaders and Firm Performance

Our hypothesis **H3** expects that the leader's education level has a positive relationship with the firm performance which means that higher education level brings better firm performance. The education levels in our sample have five categories range from technical secondary school and below to PhD degree and above.

However, we only find evidence that education level two and education level five have significant effects on firm performance for both the board chair and the CEO. We define the education level of a leader by the highest educational degree he or she ever obtained. Education level two refers to the highest degree level of a college diploma, while education level five refers to the highest degree level of PhD and above of the leaders. The findings show that having the board chair or the CEO with education level two significantly negatively affect firm performance. While having the board chair and the CEO with education level five significantly positively affects firm performance.

The results suggest that having the board chair with education level two reduces firm performance by 28.2% compared with the other firms. The effect is significant at the highest 1% level (three-star). Having the CEO with education level two reduces firm performance by 21.4% compared with the

other firms. The effect is also significant at the highest 1% level (three-star). For highly educated leaders, the board chair with a PhD degree and above significantly improves firm performance by 17.5% at the 1% significance level. While having a CEO with a PhD degree and above significantly increases firm performance by 16.9%, according to the findings. The significance reached the highest 1% level (three-star) as well. The suggestions are in part in line with Ramachandran and Shah (1999), Jalbert et al. (2002), and Carpenter (2002), etc.

In short, we document that leaders with the second-lowest education level of college diploma significantly reduce firm performance, while leaders with the highest education level of PhD degree and above significantly improve firm performance in Chinese listed firms. Other education levels, including technical secondary school and below, bachelor's degree, and master's degree, do not have effects on firm performance.

The number of leaders with the lowest education level (technical secondary school and below) is exceedingly small, only counts for 1.9% out of all the observations. We could conclude that leaders with a low education level (level 2) reduce firm performance while leaders with a high education level (level 5) improve firm performance. Education levels of the leaders in the middle (level 3 and level 4) do not have effects on firm performance.

There are many reasons and reflections behind this phenomenon. First, a college diploma is a relatively low education level in China nowadays. If we look at the board chair and the CEO with this education level, they are mostly found to be born before the 1960s and chose not to raise their education level afterwards. The leaders who have their highest degree as college diploma are behind the development of the times, especially as the leaders of the listed

firms. Facing fierce competition in the market, listed firms having leaders with a low education level become their disadvantage since nearly half of the leaders in our dataset have a master's degree. On the one hand, the knowledge of the leaders is out of date, which leads to poorer reactions when they make decisions or plan for future strategies. On the other hand, outdated knowledge also limits their management capacities which affect the firm's corporate governance efficiency. Hence, leaders with a college diploma (level 2) significantly reduce firm performance. Among the extreme cases that 1.9% of the leaders with the lowest education level of technical secondary school and below, we do not observe a significant relationship between their education level and firm performance. The leaders are mainly founder-managers of the firm under this circumstance, and they have been on leadership for a long time, ever since the firm established. According to Kaplan et al. (2012), it is likely that their 'personal ability' is particularly strong that makes up for the disadvantage of education level. The ability of implementation has a positive effect on firm performance.

Second, we find some reasons behind the results that education levels of the leaders in the middle (level 3 and level 4) do not have effects on firm performance. On the one hand, it is a widely common phenomenon in China that the leaders tend to take an MBA degree to either decorate their title or build extra personal networks in the MBA programme with other leaders. This kind of degree does not substantially improve their knowledge or abilities. Hence, this degree itself does not improve firm performance via the leader's abilities. On the other hand, China's higher education reform has resulted in the fact that most of the labour force has a bachelor's degree or a master's degree. With the continuous expansion of universities, in 2018

alone, we have 38.33 million undergraduate students and 2.73 million graduate students*. Having a bachelor's degree or master's degree is no longer a distinct advantage over others. Furthermore, higher education reform also improved the quality of higher education in China. The difference between university graduates is getting smaller. Education is less likely to be a key factor when everyone has a similar educational background. There are also scholars who find no relationships between the leader's education level and firm performance (Dyke et al., 1992; Ahn et al., 2009; Bhagat et al., 2010; Gottesman and Morey, 2006a; and Gottesman and Morey, 2006b). Especially in the findings of Gottesman and Morey (2006a), firms with CEOs from schools of high reputation perform no better than the firms with CEOs from schools of low reputation. In addition, they find no evidence that CEOs with an MBA degree or graduate from law school could bring any more benefits to the firms than others. They even found that firms with CEOs who have no MBA or law degrees performed faintly better. Gottesman and Morey (2006b) further indicated that education degree levels and the CFA qualification had no effect on firm performance.

Our findings show that the highest education level five has a significant positive effect on firm performance at the highest 1% level for both the board chair and the CEOs. Education level five refers to the PhD degree and above. On the one hand, it is a fact that obtaining a PhD degree is still difficult and rare compared with other degrees. Having the highest PhD degree widens the horizon and enhances the knowledge of the leaders, and makes their advantage of competing with other leaders. Hence, leaders with a PhD degree improves firm performance. On the other hand, unlike other education degrees, a PhD degree generally requires a higher level of

**Data source: Statistics of The Ministry of Education of the People's Republic of China (http://www.moe.gov.cn/)*

knowledge from previous studies. It is no longer a universal education for everyone but an elite education by selection. Obtaining a PhD degree makes the leaders more likely to become professionals in their areas, which helps them make better choices facing changes and competitions in daily operations. A PhD degree is more likely to distinguish a leader from the other in terms of knowledge and ability. It is evident that a high level of education improves the capacities of the leaders and firm performance.

A famous maxim of Confucius is that 'People who are excellent in learning will make a government official (to further promote benevolence)'. However, most Chinese people in this generation understand this maxim as 'if you study really well you could then become an official or someone with great success'. Though there is a misunderstanding of the accurate meaning of this maxim, it is a fact that Chinese people have a particular emphasis on learning since ancient times. We think that good education is the fundamental base for success and advantages. It is widely accepted that education is the driving force of technology and the development of our society. It also helps people to reach their career top.

But not everyone can stick to the end and keeping learning. There are also some people who take education (e.g., MBA) as a tool simply to decorate their title and build their network. We need to reflect on what we expect from our education and what we really achieve under the modern education system. Education is the driving force of technology and the development of our society, but universal education may not give us enough competitive strength any longer. Leaders should focus on how they can obtain real knowledge via a higher level of education or training that improve their general and personal abilities to make themselves competitive to improve firm performance.

The Control Group

Regarding the control group, we document that the direction and significance of each variable are the same in all the equations. The results are the same as what we found in Chapter One. For instance, in Equation [1], each unit increase of growth brings a 32.4% increase in firm performance. Each unit increase in board independence reduces firm performance by 14.2%. Together the results indicate that lower leverage, higher growth rate, smaller firm size, less board independence, and more management shares are beneficial to improve firm performance.

The findings suggest that leverage, firm size, and board independence have a negative effect on firm performance, while growth and management shares have a positive effect on firm performance. This indicates that firms with lower leverage tend to have better firm performance; it is also beneficial for the firm to have a smaller size and less board independence. This may be due to the reason that higher leverage increases the risk of the firm while a larger firm size and higher board independence reduce the corporate governance efficiency hence firm performance. Growth and management shares significantly improve firm performance. It indicates that firms with a higher growth rate tend to perform better. More management shares reduce the effect of the agency problem; hence, management shares improve firm performance.

3.5 Conclusion

This essay examined the relationships between the leaders' demographics and firm performance in Chinese markets. In this essay, we defined the leaders as the board chair and CEO since they are the top two most powerful managers in the firm and act as the firm's brain and engine in most cases. We employed Tobin's q ratio as the measurement of firm performance and the leaders' gender, age, and education levels as the measurements of the demographics. The control variables included leverage, growth, firm size, board independence, and management shares. The study period was eleven years, from 2006 to 2016.

During the empirical process, we employed STATA software to conduct all the tests and estimations. This essay employed panel data methodology and the estimation of the fixed effects on the dataset to obtain the results.

Overall, for all the Chinese listed firms, a female board chair significantly improves firm performance at the highest 1% level. The effect of female CEOs is also positive though the effect is not significant. The finding shows a significant positive relationship between the female board chair and firm performance. Having a female board chair improves firm performance by 27.6%. The reasons behind this phenomenon are explained as follows: first, women and men have different behaviour patterns in their daily life and different biological habits that affect their choices and firm performance; second, it is easier for female leaders to comply with rules that improve the efficiency of corporate governance and firm performance than male leaders.

As to the relationship between the age of leaders and firm performance, we document a significant positive relationship between leader age and firm

performance for both the board chair and the CEO. Young and senior leaders have different attitudes and preferences towards firm strategies. It is more likely for the old leaders to stay safe and reduce the risk and fluctuations of the firm to bring better performance than the young leaders. Finally, we document that a board chair or CEO with education level two (college diploma) significantly negatively affects firm performance. Having a board chair or CEO with an education level of five (PhD degree and above) was found to significantly increase firm performance by 17.5% and 16.9%, respectively.

Among the control group, the findings suggest that leverage, firm size, and board independence have a negative effect on firm performance, while growth and management shares have a positive effect on firm performance.

Although the relationship between leaders' demographics and firm performance has increasingly being mentioned in the research, extant research shows conflicting results, and scholars still cannot achieve agreement on the issues. Some scholars indicate that female and senior leaders improve firm performance (Barker III and Mueller, 2002; Yim, 2013; Nguyen et al., 2015), while others insist that gender and age do not affect firm performance (Dang et al., 2017; Ye et al., 2010). Regarding education level, some scholars believe that better-educated leaders bring better firm performance (Ramachandran and Shah, 1999; Jalbert et al., 2002; Carpenter, 2002;). There are also studies that find that the leaders' education has no effect on firm performance at all (Dyke et al., 1992; Ahn et al., 2009; Bhagat et al., 2010; Gottesman and Morey, 2006a; Gottesman and Morey, 2006b).

Thus, we find that the current literature is limited on this issue under Chinese circumstances. Existing research under Chinese circumstances either uses a

small sample (e.g., private firms only), or the study period is relatively short. Some studies investigate similar topics, but they are not able to provide a comprehensive view due to the lack of education data of the leaders in currently available datasets. This essay starts with the Human Capital framework to include gender, age, and education levels as the measurements of the leaders' demographics. This essay contributes to providing a comprehensive understanding of the topic from a long period dataset. We manually collected the leaders' education data from the firm's annual report and other official financial websites where the data is missing in current public datasets. Evidence is found that female leaders and senior leaders significantly improve firm performance. Firm performance is also significantly improved where leaders had a PhD degree. This essay extends the current understanding of how leaders' demographics affect firm performance in the context of China. It also contributes to an understanding of the trend of corporate governance in China.

The findings of this essay provide a comprehensive view of the effects of leaders' demographics on the firm performance in Chinese listed firms. It not only provides information on trading strategies for investors and institutions in the market, but it also indicates the trend of corporate governance where females are becoming more welcome in modern Chinese society. The findings provide evidence and suggestions for the daily operations and long-term strategies for Chinese listed firms to improve firm performance.

However, a limitation of this essay is that we did not investigate the ranking effect of the leaders' education level on firm performance. We suggest new methodologies and methods to test how education rank affects firm performance and performance of further sub-sample tests in future work.

Appendix

Correlation Coefficient of the Variables – Chapter 3

	1	2	3	4	5	6	7	8	9	10
1	1									
2	0.0315	1								
3	-0.0833	-0.0475	1							
4	0.0300	0.2415	-0.0024	1						
5	-0.0574	-0.0266	0.2884	-0.0302	1					
6	-0.3065	-0.0253	-0.0373	-0.0215	0.0118	1				
7	0.0012	-0.0002	-0.0205	0.0195	-0.0360	-0.0213	1			
8	-0.5109	-0.0371	0.1786	-0.0432	0.1567	0.3634	0.1583	1		
9	-0.1812	-0.0288	0.0779	-0.0439	0.0918	0.1817	-0.0071	0.3769	1	
10	0.0346	-0.0015	-0.0042	-0.0017	-0.0019	0.0266	-0.0154	-0.0159	-0.0128	1

*1: Tobin's Q Ratio; 2: Board Chair's Gender; 3: Board Chair's Age; 4: CEO's Gender; 5: CEO's Age; 6: Leverage; 7: Growth; 8: Firm Size; 9: Board Independence; 10: Management Shares.

Breusch and Pagan Test for Equation [3]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.009566	2.238206
	e	2.177795	1.475736
	u	1.660819	1.288728
Test:	**Var(u) = 0**		
		chibar2(01) =	10167.45
		Prob > chibar2 =	0.0000

Breusch and Pagan Test for Equation [4]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.009566	2.238206
	e	2.176294	1.475227
	u	1.65649	1.287047
Test:	**Var(u) = 0**		
		chibar2(01) =	10120.73
		Prob > chibar2 =	0.0000

Breusch and Pagan Test for Equation [5]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.009566	2.238206
	e	2.1781	1.475839
	u	1.657656	1.2875
Test:	**Var(u) = 0**		
		chibar2(01) =	10141.78
		Prob > chibar2 =	0.0000

Breusch and Pagan Test for Equation [6]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.009566	2.238206
	e	2.177862	1.475758
	u	1.660595	1.288641
Test: **Var(u) = 0**			
		chibar2(01) =	10144.48
		Prob > chibar2 =	0.0000

Breusch and Pagan Test for Equation [7]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.009566	2.238206
	e	2.177193	1.475532
	u	1.658521	1.287836
Test: **Var(u) = 0**			
		chibar2(01) =	10070.20
		Prob > chibar2 =	0.0000

Breusch and Pagan Test for Equation [8]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.009566	2.238206
	e	2.17781	1.47574
	u	1.660878	1.288751
Test: **Var(u) = 0**			
		chibar2(01) =	10164.39
		Prob > chibar2 =	0.0000

Breusch and Pagan Test for Equation [9]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.009566	2.238206
	e	2.176771	1.475388
	u	1.648186	1.283817
Test:	**Var(u) = 0**		
		chibar2(01) =	10049.54
		Prob > chibar2 =	0.0000

Breusch and Pagan Test for Equation [10]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.009566	2.238206
	e	2.17779	1.475734
	u	1.660974	1.288788
Test:	**Var(u) = 0**		
		chibar2(01) =	10173.49
		Prob > chibar2 =	0.0000

Breusch and Pagan Test for Equation [11]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.009566	2.238206
	e	2.178057	1.475824
	u	1.660806	1.288723
Test:	**Var(u) = 0**		
		chibar2(01) =	10175.45
		Prob > chibar2 =	0.0000

Breusch and Pagan Test for Equation [12]

Breusch and Pagan Lagrangian Multiplier Test for Random effects			
tobin[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	sd = sqrt(Var)
	q	5.009566	2.238206
	e	2.177284	1.475562
	u	1.64863	1.28399
Test: **Var(u) = 0**			
		chibar2(01) =	9970.27
		Prob > chibar2 =	0.0000

Hausman Test Results for Equation [3]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
be1	0.292235	0.115135	0.1771	0.126823
lev	-0.53807	-0.93584	0.397768	0.050496
gro	0.303118	0.369332	-0.06621	0.010649
size	-0.81133	-0.81562	0.004296	0.01228
inde	-0.14024	-0.07059	-0.06965	0.016381
ms	0.000114	0.000165	-5.1E-05	7.93E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 164.45

Prob>chi2 = 0.0000

Hausman Test Results for Equation [4]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
be2	-0.28241	-0.28355	0.001142	0.043717
lev	-0.53687	-0.9401	0.403228	0.050602
gro	0.308432	0.372991	-0.06456	0.010661
size	-0.81706	-0.82129	0.004235	0.012333
inde	-0.13588	-0.06968	-0.0662	0.016426
ms	0.000111	0.000164	-5.3E-05	7.89E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 181.11

Prob>chi2 = 0.0000

Hausman Test Results for Equation [5]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
be3	-0.01532	0.01942	-0.03474	0.022139
lev	-0.54276	-0.93933	0.396568	0.050597
gro	0.305341	0.370319	-0.06498	0.010629
size	-0.8111	-0.81515	0.00405	0.012296
inde	-0.14008	-0.07084	-0.06924	0.016393
ms	0.000111	0.000164	-5.3E-05	7.81E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 187.27

Prob>chi2 = 0.0000

Hausman Test Results for Equation [6]

	--- Coefficients ---			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	fe	**re**	**Difference**	**S.E.**
be4	-0.05515	-0.05302	-0.00212	0.019907
lev	-0.54193	-0.93737	0.395433	0.050558
gro	0.303491	0.369058	-0.06557	0.010672
size	-0.80828	-0.81392	0.005636	0.012336
inde	-0.14101	-0.07152	-0.06949	0.016397
ms	0.000112	0.000164	-5.3E-05	7.86E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 182.29

Prob>chi2 = 0.0000

Hausman Test Results for Equation [7]

	--- Coefficients ---			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
be5	0.175058	0.200597	-0.02554	0.03205
lev	-0.54038	-0.93866	0.398278	0.050586
gro	0.305727	0.371396	-0.06567	0.01064
size	-0.81334	-0.82023	0.006888	0.012253
inde	-0.14147	-0.07347	-0.068	0.016385
ms	0.000111	0.000164	-5.3E-05	7.89E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 181.7

Prob>chi2 = 0.0000

Hausman Test Results for Equation [8]

	--- Coefficients ---			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
ce1	0.256593	0.158362	0.098231	0.090809
lev	-0.53941	-0.93603	0.396615	0.050528
gro	0.305259	0.370062	-0.0648	0.010625
size	-0.81087	-0.81555	0.004686	0.012274
inde	-0.13914	-0.07024	-0.06891	0.016385
ms	0.000111	0.000164	-5.3E-05	7.84E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 183.82

Prob>chi2 = 0.0000

Hausman Test Results for Equation [9]

	--- Coefficients ---			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
ce2	-0.21363	-0.29194	0.078308	0.032446
lev	-0.53782	-0.93527	0.397453	0.050664
gro	0.307323	0.373227	-0.0659	0.010658
size	-0.81573	-0.82257	0.006842	0.012315
inde	-0.13816	-0.06998	-0.06818	0.016425
ms	0.000111	0.000164	-5.3E-05	7.87E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 185.39

Prob>chi2 = 0.0000

Hausman Test Results for Equation [10]

	--- Coefficients ---			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
ce3	-0.06113	-0.0571	-0.00403	0.017065
lev	-0.5421	-0.93955	0.39745	0.050565
gro	0.304702	0.369673	-0.06497	0.010631
size	-0.81131	-0.81645	0.005145	0.012273
inde	-0.13981	-0.07103	-0.06878	0.016387
ms	0.00011	0.000163	-5.3E-05	7.88E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 181.86

Prob>chi2 = 0.0000

Hausman Test Results for Equation [11]

	--- Coefficients ---			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
ce4	0.023959	0.025406	-0.00145	0.016146
lev	-0.5416	-0.93884	0.397235	0.050582
gro	0.305289	0.370264	-0.06498	0.010633
size	-0.81122	-0.8162	0.004983	0.012287
inde	-0.13994	-0.07087	-0.06907	0.016389
ms	0.00011	0.000163	-5.3E-05	7.87E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 182.01

Prob>chi2 = 0.0000

Hausman Test Results for Equation [12]

	--- Coefficients ---			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
ce5	0.169106	0.262145	-0.09304	0.03023
lev	-0.54031	-0.9376	0.39729	0.050658
gro	0.304388	0.370642	-0.06625	0.01065
size	-0.81234	-0.82082	0.008476	0.012257
inde	-0.14008	-0.07313	-0.06695	0.016406
ms	0.000111	0.000164	-5.3E-05	7.85E-06

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B) ' [(V_b-V_B)^(-1)](b-B)

= 189.46

Prob>chi2 = 0.0000

Rewrites of Equations with Estimation Results

$$FP_{it} = 20.50 + 0.276BFE_{it} + 0.013BAG_{it} - 0.531LE_{it} + 0.324GRO_{it} - 0.829SIZE_{it} - 0.142INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [1]$$

$$FP_{it} = 20.49 + 0.011CFE_{it} + 0.013CAG_{it} - 0.554LE_{it} + 0.321GRO_{it} - 0.824SIZE_{it} - 0.148INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [2]$$

$$FP_{it} = 20.79 + 0.292BE1_{it} - 0.538LE_{it} + 0.303GRO_{it} - 0.811SIZE_{it} - 0.140INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [3]$$

$$FP_{it} = 20.93 - 0.282BE2_{it} - 0.537LE_{it} + 0.308GRO_{it} - 0.383SIZE_{it} - 0.136INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [4]$$

$$FP_{it} = 20.79 - 0.015BE3_{it} - 0.543LE_{it} + 0.305GRO_{it} - 0.383SIZE_{it} - 0.140INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [5]$$

$$FP_{it} = 20.76 - 0.055BE4_{it} - 0.542LE_{it} + 0.303GRO_{it} - 0.383SIZE_{it} - 0.141INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [6]$$

$$FP_{it} = 20.82 + 0.175BE5_{it} - 0.540LE_{it} + 0.306GRO_{it} - 0.383SIZE_{it} - 0.141INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [7]$$

$$FP_{it} = 20.78 + 0.0439CE1_{it} - 0.539LE_{it} + 0.305GRO_{it} - 0.811SIZE_{it} - 0.139INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [8]$$

$$FP_{it} = 20.90 - 0.0782CE2_{it} - 0.538LE_{it} + 0.307GRO_{it} - 0.816SIZE_{it} - 0.138INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [9]$$

$$FP_{it} = 20.81 - 0.000336CE3_{it} - 0.542LE_{it} + 0.305GRO_{it} - 0.811SIZE_{it} - 0.140INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [10]$$

$$FP_{it} = 20.78 + 0.0175CE4_{it} - 0.542LE_{it} + 0.305GRO_{it} - 0.811SIZE_{it} - 0.140INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [11]$$

$$FP_{it} = 20.80 + 0.0836CE5_{it} - 0.540LE_{it} + 0.304GRO_{it} - 0.812SIZE_{it} - 0.140INDE_{it} + 0.0001MS_{it} + \mu_i + \varepsilon_{it}; \quad i = 1, \dots N; t = 1, \dots T \quad [12]$$

Concluding Remarks

In the first chapter, we estimated the effects of the leadership's political connections and personal characteristics on firm performance in Chinese listed firms. The study period is 2006-2016, and the sample includes all the listed firms in China's Shanghai and Shenzhen stock exchanges to obtain a comprehensive understanding of the topic. It employed panel data methodology and the estimation of the fixed effects on three models to examine the hypotheses. We document a significant negative relationship between political connection and firm performance, which indicates that the leader's political connection reduces firm performance. Our finding shows that the general political connections and the board chair's political connections are significantly negatively related to firm performance at the highest 1% level (three-star). The CEO's political connection is also significantly negatively related to firm performance with a significance of 5% level (two-star). This may be due to the reasons that, first, politically connected firms are more likely to be controlled by the government that have low operating efficiency; second, politically connected firms have more access to government bailouts that leads to poor resource allocation; and at last, politically connected firms have less motivation to improve the efficiency and performance. The findings also suggest that the board chair's political connection is more powerful than that of the CEO's political connection. We further employed estimations on sub-samples of SOEs and non-SOEs. We document a significant positive relationship between political connections and firm performance in non-SOEs which indicates that political connection is more beneficial for private listed firms.

In the second chapter, we investigated the political economy in China and the relationship between political connections and the firm's cost of debt.

The study period is eleven years, from 2006 to 2016, and the dataset includes all the listed firms in Chinese stock markets except for the firm in the Finance sector. During the empirical analysis, it employed panel data methodology and the estimation of the fixed effects after comparison. We document that political connections significantly negatively related to the firm's cost of debt. The results are robust to different control groups. It also contributes by dividing the board chair and the CEO's political connection and investigating their effects on the firm's cost of debt further. The findings also suggest that male and senior leaders lead to a higher cost of debt which indicates that female and younger leaders are favourable when the firm seeks debt financing. The effects of both the board chair's age and the CEO's age are significant at 1% and 5% level, respectively. Among the control variables, leverage and firm size have positive effects on the firm's cost of debt. Board independence and credit rating information have negative relationships with the firm's cost of debt. The findings of this chapter provide a comprehensive view of the effects of political connections of the leaders on the firm's cost of debt in Chinese listed firms. It also examined other key influencing factors such as government ownership and CEO duality, etc.

In the last chapter, we studied the relationships between the leader's demographics and firm performance in Chinese markets. We defined the leaders as the board chair and CEO since they are the top two most powerful managers in the firm and act as the firm's brain and engine in most cases. We employed Tobin's q ratio as the measurement of firm performance and the leader's gender, age, and education levels as the measurements of the demographics. The control variables include leverage, growth, firm size, board independence, and management shares. The study period is eleven years, from 2006 to 2016. We document that female leaders and senior leaders significantly improve firm performance, while the highest education

level PhD and above also has a significant positive effect on firm performance. The findings indicate that female board chair significantly improves firm performance at the highest 1% level. The effect of female CEOs is also positive though the effect is not significant. The reasons behind this phenomenon are explained as follows: first, women and men have different behaviour patterns in their daily life and different biological habits that affect their choices and firm performance; second, it is easier for female leaders to comply with rules than male leaders that improve the efficiency of corporate governance and firm performance. As to the relationship between the leader's age and firm performance, we document a significant positive relationship between the leader's age and firm performance for both the board chair and the CEO. Young and senior leaders have different attitudes and preferences towards firm strategies. It is more likely for the old leaders to stay safe and reduce the risk and fluctuations of the firm to bring better performance than the young leaders. At last, we document that having the board chair or the CEO with education level two (college diploma) significantly negatively affect firm performance. While having the board chair or CEO with education level five (PhD degree and above) significantly increases firm performance by 17.5% and 16.9%, respectively.

Our core thesis is that political connections and personal demographics of the leaders have significant effects on firm performance and the cost of debt in Chinese listed firms. Our thesis supplements extant literature of the general effect of political connections on firm performance and corporate governance; and offers a subdivided understanding of the roles that political connections play in various issues. It not only provides information on trading strategies for investors and institutions in the market, but it also indicates the trend of corporate governance, for example, females becoming more welcome in modern Chinese society. The findings provide evidence

and suggestions for the daily operations and long-term strategies for Chinese listed firms to improve firm performance.

The results indicate that political connections and the leader's demographics do have an impact on firm performance. On this basis, it is recommended that Chinese listed firms use political connection and the feature of the leader's demographics as a key factor in designing and targeting their campaigns. Further research is needed to identify different political connections, education rankings, and education elements, etc., with more sub-sample tests to provide more evidence.

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