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Article

Does the compensation gap between executives and staffs influence future firm performance? The moderating roles of managerial power and overconfidence

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Empirical Paper

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Does the compensation gap between executives and staffs influence future firm performance? The moderating roles of managerial power and overconfidence

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Abstract: The study aims at identifying the influence of interior pay gap between senior executives and ordinary employees on the organization's future performance for listed Chinese firms. In addition, two other moderator variables have been included in the study referring management power as the percentage of senior managers holding "A" category shares for more than one position. The other one is managerial overconfidence defined as the change in management holdings by themselves (managers) positively. The paper is based on secondary data extracted from China's 'A' listed companies in Shanghai and Shenzhen Stock Exchanges with a valid sample size of 1,189. After detailed analysis (Pearson correlation and regression) between the variables, it was found that there is a moderate positive relationship between the pay gap and firms' future performance. The results further indicate that management power and overconfidence weaken the relationship between pay gap and corporate performance. The authors hope that this empirical study can guide the academicians intending to further excavate in this relatively uncharted area as well as the corporate body and top managers who seek some guidelines to formulate an effective pay plan.

Keywords: China, pay gap, performance, firm, managerial power, managerial overconfidence **JEL Classification:** M1, M14

1 Introduction

With the dynamic development of market economy, the pay gaps in the diversified jobs are widening gradually and have become a center of attraction for academia and corporate world. However, the views of the academic community regarding economic consequences of pay gap within the firms have not been unified yet, and they have consequently developed two unique theories: tournament theory and behavior theory. The first theory argues that pay gap can have a positive incentive effect on senior executives and ordinary employees, saving the agency cost to the client and promoting sustainable development in the firm. On the other hand, behavior theory believes that pay gap would undermine the fairness of internal compensation and reduce enthusiasm and team cohesiveness of employees, thereby hindering the progress of the organization. Both of these perspectives have been supported by scholars despite having a few disagreements regarding the severity of impact. Therefore, it is crucial to pay special concentration to the fact that such pay gap requires a systematic procedure that is frequently absent. In recent years, the "abnormal pay gap phenomenon" between senior executives and ordinary workers has been quite common

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all over the world. Such difference is clearly evident in both developed and developing countries where the executive pay is almost hundred times higher than the pay of average employees. Irrespective of local or multinational firms, or big or small firms, this issue has become a matter of discontent among the countless ordinary employees and has got the attention from academicians and policymakers.

Listed Companies Executive Pay Index [2017] pointed out that in United States in 2016, the annual payment of the top three senior positions in most large companies, particularly involved in technology, has exceeded billions. However, in China, the average monthly salary in 2017 in Beijing was 8,315 RMB, whereas in Shanghai and Shenzhen, it was 8,962 RMB and 8,315 RMB, respectively [China Salary Guide, 2017]. As it is already known, although the average wage in these three cities has ranked the top in China, the pay gap between the managers and ordinary workers has already become a center of debate. In fact, the Chinese Central Government has issued a series of regulatory measures to curb "malformed" executive pay. As an example, during 2002, the Central Government began implementing a "Yearly Salary System" for state-owned enterprise (SOE) executives, pointing that the total annual income should not exceed the average employees' income. However, with the economic expansion and improvement in the efficiency of SOEs, this proportion has been violated largely. In 2009, the Ministry of Human Resources issued a guide to further standardize the management and control of payment of skyhigh remuneration. In order to establish and improve the level of performance and responsibility and to reduce risk, "Management Enterprise Pay System Reform" was implemented in January 2015. However, the existing measures are only applicable for the SOEs to control the payment of executives, and hence, the effect is very limited.

It cannot be denied that employees are the core of organizational resources; the substantial pay gap between senior executives and general staffs in fact reflects that the organizations have not really paid attention to the value of their human resources. The rationality of compensation scheme would affect the degree of satisfaction of employees, which, in turn, would influence the individual and business performance. A scientific and effective remuneration package should include a reasonable design and redesign of job level and incentive (horizontal and vertical pay gap) to motivate employees in creating value and achieve desired performance goals. Therefore, the question arises how to reduce the undesirable salary gap among various job ranks without hurting the senior executives. The answer requires us to carefully formulate and execute a scientific and rational income distribution between executives and ordinary employees. The abnormal pay gap is not only embarrassing from the perspective of ordinary employees but also a dilemma from the viewpoint of the organizations to relate social income and even the overall harmony of the society.

At present, academic evidences about the association between pay gap and enterprise performance are quite abundant based on tournament and behavioral theories. However, there are still a few disagreements among the scholars and they have not yet reached in a consensus regarding the relationship between these two theories. Therefore, the current study has considered the same period of cross-section data where the actual research interest is to investigate the impact of pay gap on individual and enterprise performances to avoid the lag. Furthermore, the study focused on the analysis of internal and external environmental factors such as organizational size, capital structure, equity nature, and the size of top management team. The managerial characteristics on internal pay gap were rarely involved in previous literature. In particular, the study of the effect of extreme managerial overconfidence on the firm performance is not yet available. However, it has been assumed in this study that managerial overconfidence and power are the two subdivisions of management characteristics. Considering these two moderating variables, the relationship between pay gap and organizational performance is worth exploring. As the economic reform in China is entering into the deepening stage, the issue of pay gap and its impact on the organizational performance is becoming a center of debate. Therefore, the authors put forward two research questions for this study:

- RQ: What is the exact impact of pay gap on firms' future performance?
- **RQ:** What are the roles of management power and overconfidence over the relationship between pay gap and performance?

2 Theoretical overview

Scholars have conducted sufficient explorations to endeavor the relationship between pay gap and enterprise performance and got many conclusions. Academic relationship between pay gap and organizational performance is affluent. At present, more attention is being given to other moderators such as the attitude of internal and external stakeholders. This section of the paper provides a brief overview of different concepts related to this study and literature evidence on the relationship between the factors.

2.1 Tournament theory perspective

One of the most influential theories regarding pay gap is the tournament theory proposed by Lazear and Rosen [1981]. Rosen [1986] focused on the salary gap within the executive team and concluded that larger pay gap can actually promote the growth of organizational performance, indicating the tournament theory is more suitable to explain the relationship between pay gap and organizational performance. O'Reilly et al. [1988] made an investigation on listed US firms and found that tournament theory can articulate more the pay gap between CEO and other executives. McLaughlin [1988] and Prendergast [1999] concluded that as the size of the executive team expands, its internal participation in tournament competition increases, thus reducing the probability of participants to win. For expecting the benefits of incentive effect uncompromised, there is a real need to broaden the income gap among the levels within the executive group. Milgrom and Roberts [1992] found that the larger the pay gap, the stronger is the incentive to attract more talented people. According to them, high rewards for high performers contribute to the promotion of corporate value and help motivate low performers to actively improve efficiency to share more income cakes. Lambert et al. [1993] concluded that the salary gap between the higher ranks of senior executives is often greater such as the pay gap between CEO and the number two. They further concluded that the salary gap certainly plays a role in promoting the business environment. Joskow and Nancy [1994] exploring through an empirical analysis reported a positive correlation between executive stock ownership and firm performance, and such an absolute pay gap has a much stronger incentive to overall organizational performance.

Main et al. [1993], based on the investigation in 210 US firms from 1980 to 1984, found that the pay gap between the executives has a positive impact on the total asset yield and return on equity. At the same time, it was also found that as the management team enlarges, the probability of getting a promotion is smaller. Thus, the enterprises actually require increasing the competitive reward to ensure the incentive of pay gap to reach the expected level. Eriksson and Lausten [1996] also considered that the difference between CEO pay and the average pay increases the performance with the size of the latter one. Henderson and Fredrickson [2001] in their analysis of 189 US home enterprises discovered that the salary gap of internal executive team has a positive influence on organizational performance, and thus, it is more appropriate to use tournament theory to explain the salary gap within the executive team. Bognanno [2001], Conyon et al. [2001], Audas et al. [2004], and Lallemand et al. [2008] have also confirmed the rationality of tournament incentive from various perspectives. According to Reeves et al. [2009], the companies' internal employee ownership is becoming more a common phenomenon and it can efficiently reduce the income gap between the owner and the general staffs, while increasing the performance level. Milkovich et al. [2011] believe that with the salary gap among the executives, the incentive effect is far less than expected leading to dissatisfaction with higher ranked managers, which affects organizational performance. Lee et al. [2015] found that the salary gap among the managers has a positive effect on organizational performance. He also found that agency costs within the company have an enhanced effect on the positive relationship between the two.

The Chinese scholars began their research on internal pay gap in 2003. Chun et al. [2003] analyzed the listed companies from 1999 to 2000 and found that salary gap within the executive team has a significant positive impact on organizational performance. They proposed to increase the incentive effect by enlarging the pay gap. At the same time, they explored that the incentive effect of absolute pay gap is greater than its impact on the market performance and that of pay gap on long-term accounting performance is larger than on short-term accounting performance. Chen et al. [2014] in the study of equity incentive found that with the expansion of different management staffs in the company, the performance level of enterprises

improves, thus verifying that the tournament theory is applicable to the local Chinese executive equity incentive. Zhou [2000] believes that there is no significant difference in the variables that affect the differential compensation, e.g., the variables that affect the pay gap of high growth enterprises are mostly the size of the executive team, the location of the firm, the size of the firm, and salary level. On the other hand, the variables that affect the salary gap of the low growth firms are the size of the executive team and the location of the firm. However, in both cases, the difference in executive level pay has a positive influence on the performance level of the firm. Lu [2007] using the data of listed companies from 2001 to 2006 concluded that the internal monetary pay gap between the executives has a significant positive impact on the current market performance. According to Zhao [2012], regarding the executive pay gap in the industry segmentation research on China's listed manufacturing firms, the presence of an appropriate income gap within the executive team strengthens the level of organizational performance. Li et al. [2007] in their study of executive team's internal pay gap examined the managerial power characteristics of regulatory role. They found that management power features and pay gap interaction have a negative impact on corporate performance, indicating that the organization's internal managerial power weakens the incentive effect of the pay gap to some extent.

Kato and Long [2006] using a sample of the listed companies from Shanghai and Shenzhen stock exchanges discovered that the internal pay gap in the senior management team has a positive influence on the performance of the organizations, but not in a significant manner. However, after employing the cooperative demand variable, they found that the interaction with the executive pay gap has a significant positive impact on organizational performance showing that cooperative demand variable has an extended effect on the relationship between the two. In other words, when the cooperation demand among senior executives is at a higher level, the proper expansion of pay gap can effectively save client's monitoring cost, improve the performance of the team members, and promote the development of the firm. Jun [2014] explored the relationship between pay gap and organizational performance profoundly and concluded that pay gap between the CEO and other members of the executive team contribute positively to the total asset yields and earnings per share (EPS).

Wanli and Shaoxiang [2006] and Chun et al. [2003] commented that the salary gap between executives and employees still has incentive effect although it is the priority of enquiry. Liu [2016] studied the nature of equity among the SOEs and found that the pay gap between the executives and employees is more obvious. The pay gap between the executives and employees in the SOEs has stronger incentive to enterprise performance. In another words, the pay gap between the CEO and senior executives with high collaboration needs is more conductive to the company performance. Shaorong et al. [2011] in their study of the relationship between executive team members' pay gap and organizational performance concluded that the vertical pay gap has a significant positive impact on the performance of organizations, while the salary gap and technological intensity in the industry play a significant role in adjusting the incentive effect of the vertical pay gap. Lu [2007] in the domestic listing section of the enterprises as a sample discovered that the financial position is normal on the basis of sample enterprises into two groups; the tournament incentive effect is more obvious at the enterprises, while CEO's power can effectively enhance the positive relationship between the two. Additionally, Tong [2008], Lin et al. [2013], Wang [2014], and Wang [2015] adopted different points of different industry samples for the analysis and found the influence of tournament theory on organizational performance.

2.2 Behavioral theory perspective

Scholars at China and abroad also conducted some empirical analysis on behavioral theory and confirmed that internal pay gap has a negative impact on business performance. Cowherd and Levine [1992] reported that the salary gap between the lower level staffs and executives has a significant negative impact on work quality. Joskow and Nancy [1994] and Reeves et al. [2009] agreed that the timely narrowing of pay gap between senior executives and ordinary employees can promote the development of enterprises and improve performance. Mason et al. [2004] confirmed that the pay gap between the CEO and other executive members has a negative influence on organizational performance. Cooper et al. [2009] introduced future

performance variables to study the lagging effect of pay gap and found that non-CEO compensation has positive incentive for future performance but the pay gap between the CEO and other executives is a negative disincentive to future performance. This conclusion provides us a new perspective that the incentive to pay for current performance and the impact of future performance is not the same. Siegel and Hambrick [2005] using the high-tech listed companies as a sample found that the widening pay gap will undermine the senior management team within the exchange of cooperation among members and thus adversely affect the performance of the firms indicating that the behavioral theory in the high-tech industry had certain applicability.

Zhang et al. [2008] took the total asset yield and EPS to represent the organizational performance. In their study, they selected 2001 to 2006 for collecting the data of the listed firms in China to study the influence of salary gap between the executive team and the whole management group on the performance of organizations. Using the absolute and relative pay gap of these two indicators showed that the two gap indicators have a significant negative impact on organizational performance. The result suggests that behavioral theory can better explain the pay gap between the CEO and other core executives. In addition, after introducing three regulatory variables, such as company size, technical complexity, and executive team collaboration, it was found that the first two regulatory variables has a strong negative relationship with the two, while the third variable weakened the negative relationship with the two. Lu [2007] using cooperative demand variable to study the gap between executive pay and performance of the adjustment of the effectiveness of firms found that when senior management does not collaborate demand motivation, the widening pay gap damages the company's operating performance.

In terms of industry segmentation, Zhou et al. [2009] conducted the research on the manufacturing industry of Chinese listed enterprises and reported that the salary gap between the executive team members and the business performance is not positively correlated. Rather, the relationship depicted a negative correlation indicating that the increase in salary gap between executive members does not necessarily promote the growth of enterprise performance. Liu and Sun [2010] studied the domestic listed enterprises in the year 2009 and found that the executive team members' pay gap difference and the business performance are in a reverse relationship to promote the growth of a corporate performance. Additionally, Carpenter and Sanders [2004], Lu et al. [2009], and Zhang and Yanan [2013] tried to authenticate the behavioral theory from different aspects.

2.3 The concept of management power

According to assumption of management power theory, managers will use their own power advantage with the board. As the managers are "Rational Economic Person" and they can participate in board meetings, the board inclining to gain private interests. This makes the compensation contract difficult to show its original incentive effect that is not conductive to the promotion of corporate performance.

Power is essentially an incentive whereas a promotion means having more power. To achieve it, managers will work harder to increase their contribution to the organization and promote the organizational value for winning the promotion competition. But in reality, a higher rank indicates higher responsibility. In the face of more difficult performance goals, executives are destined to devote more effort. Secondly, service consumption and other benefits are often accompanied by high power and managers' share of personal spending will be reduced. Managerial power is also a monetary incentive improving external reputation of executives, strengthening influence within the enterprise and intangibly increasing monetary remuneration. Thus, promotion can be regarded a more effective incentive and a good source of management power that can weaken incentive for compensation.

He and Fang [2015] in their study concluded that executive compensation has a strong impact on power. They added that executive pay level and organizational performance are positively correlated. However, the impact of increase in executive pay over the increase in remuneration of workers is much greater. Li [2015] believes that management will be based on the increase and decrease in corporate performance to develop income distribution system. If the performance growth is strong, management will magnify the relationship between pay and corporate performance for their own greater self-interest. Conversely, when performance

is weak, management will try to weaken the correlation between the two. These findings greatly enriched the management power theory.

Theoretically, the expansion in management authority is accompanied by a rise in pay levels, but it does not mean that the executives can do whatever they want. When managers get far more than market average, they face accusations and pressures from the media, shareholders, employees, and so many other stakeholders, creating a kind of "anger costs". Often the executives disguise their income levels and weaken the relationship between earnings and performance, which also explains the reason behind weaker correlation between executive pay and performance when management power is larger.

2.4 Management overconfidence theory

From a psychological point of view, overconfidence grows due to the external environment and declines due to own cognitive errors. However, people often mark the success as their own talent and ignore external factors such as luck and opportunity [Hayward and Hambrick, 1997]. This is actually a "better than average" mentality and in all aspects shows superior talent and decision-making beyond average [Langer, 1975]. This kind of overconfidence is a manifestation of irrational psychology opposite to excessive pessimism that indicates lack of confidence. Different psychological states will have various impacts on the development and performance of enterprises.

Psychology argues that professionals are more prone to overconfidence when making decisions. Therefore, overconfidence in management appears more in the following groups: investment bankers, government officials, artists, lawyers, and corporate executives. Managers with overconfidence tend to have the following manifestations.

2.4.1 Self-attribution

When people become successful, due to cognitive errors, it is easy to attribute success to their own factors. Conversely, at the time of failure, they automatically ignore their own limitations and put the blame on external objective conditions such as fate and lack of opportunity. Fiske and Taylor [1991] in their study found that the "self-reinforce attribution" after victory is more common than the "self-protection attribution" after defeat, illustrating overconfidence as psychological bias, which is more likely to occur in the population.

2.4.2 Controlling hallucinations

At the time of performing a task, people tend to think that it can be manipulated by them, ignoring the existence of some uncontrollable factors. Langer [1975] studied the betting events where people tend to choose their own numbers rather than machine numbers in order to achieve the psychological satisfaction of improving the "odds" of winning. Based on this conclusion, he had a more in-depth analysis of the executive team and found that the same mentality is true for senior executives too. Executives often feel that the development of enterprises and investment decisions are under their own control, ignoring other uncertainties, overestimating the profit, and underestimating the risks. Such overconfidence often results in drastic decision failure.

2.4.3 Overly optimistic

Excessive optimism refers to the tendency to think of future events as being in the right decision. Cooper et al. [1988], an American entrepreneur, found that the percentage of entrepreneurs thinking their company is successful is almost 80%, while the percentage of others thinking they can succeed is as low as 60%. The real findings are surprisingly close to the companies involved in the survey was

later ended is dismal and the percentage was 60%. Researchers such as Heaton [2002] confirmed this phenomenon.

2.5 Summary of the previous researches on executive pay gap, managerial power and firm performance

Some scholars [Henderson and Fredrickson, 1996; Conyon and Peck, 1998; Elhagrasey et al., 1998; Finklestein and Boyd, 1998; Core et al., 1999; Grinstein and Hribar, 2003; Cheng and Firth, 2005; Shin, 2008; Lu et al., 2010; Xiao and Wu, 2010; Choe et al., 2014; Dai, 2014; Yan et al., 2015; Graham et al., 2017] have confirmed that there is a significant positive correlation between managerial power and the pay gap. According to them, as managerial power increases, the income levels of employees in various ranks will be more significant. The management-level power characteristics as an important element of corporate governance increase the likelihood that managers will gain more self-interest, particularly in SOEs. Theoretically, the board and the managers are the principal agents. They will act for their own interests, and as the management power increases at the board, the game becomes imbalanced. Therefore, managers tend to make their own decisions with a motive to make decisions for more self-interest. This would result in further widening the pay gap between the senior executives and the general staffs that will not only reduce the need for collaboration of management teams but also inhibit the enthusiasm of the employees. This will greatly endanger the improvement of organizational performance and future development. Reviewing the literature from China and abroad, it was found that the number of scholars arguing that the managerial power is directly related to pay gap is very high. Scholars, in addition to performing research in management power and pay gap, made in-depth discussion on managerial relationship between power and corporate performance [Adams et al., 2005; Wang and Wang, 2007], making the management power characteristics in the field of corporate governance research results more solid and comprehensive.

However, for management power, the study of the moderating effect between the pay gap and enterprise performance has only begun in recent years and the academic literatures are still quite a few. Through the management of the executive power of the pay gap and corporate performance of the regulatory role literature, different scholars [Conyon, 1997; Core et al., 2001; Lu, 2007; Lee et al., 2008; Lu et al., 2008; Kale et al., 2009; Xiao and Wu, 2010; Jiwa, 2015; Lin, 2015; Rouen, 2017] recommended different measures to regulate managerial power, leaving the conclusion uncompromising and different. This indicates that the discussion on managerial overconfidence in the adjustment of pay gap is critical as well as difficult.

2.6 Summary of the research on the gap between executive pay, managerial overconfidence, and corporate performance

The study on the psychological field of overconfidence started in early 20th century. Frank [1935] suggested that people tend to be overly optimistic in the face of uncertainty and overestimate their ability to underestimate potential risks and such optimism is related to the degree of importance of their role, e.g., the more important the role of optimism, the more the overconfidence. Weinstein [1980] and Taylor and Brown [1988] found that the individuals are always accustomed to be optimistic about their own talents and knowledge. Schneider [1981] also found that people tend to think of success because of their own talents but blame their failure on the external environment interferences.

Larwood and Whittaker [1977] introduced the concept of overconfidence into the field of management and argued that executives, as the elites in the society, are a group of people who are more prone to overconfidence. Langer [1975] suggests that senior executives tend to have far high levels of overconfidence than the ordinary workers. There are comparatively few attempts to analyze the relationship between overconfidence and firm performance. Large volumes of literature have been analyzed to extract the mainstream of the three distanced views. First, some academicians support the argument that managerial overconfidence has a positive impact on the enterprise performance [Fairchild, 2007; Gervais et al., 2009; Hribar and Yang, 2010]. Second, some scholars such as Roll [1986], Doukas and Petmezas [2007], Malmendier and Tate [2008], Huang et al. [2011], and Yilmaz and Mazzeo [2014] have found a negative impact of managerial overconfidence on the firm performance. There is also a third view of researchers [Chen and Findlay, 2002; Goel and Thakor, 2008] who believe that the positive and negative views should be integrated, and they proposed a nonlinear correlation among the two variables.

Through the carding relationship between management overconfidence and enterprise performance, it can be concluded that the scholars are not in a uniform agreement, which may be related to the measurement index of different management overconfidence. As the managerial overconfidence is a state of mind, there is no means to get direct access to financial and micro indictors. Most of the scholars use their substitution variables to measure such overconfidence. In addition, some scholars use comprehensive indicators, while others use a single indicator. All these indicators have a certain degree of impact on the accuracy of results. Still now, the researchers are trying to explore more management layer of overconfidence characteristics of substitution variables or more scientific and reasonable measurement methods in order to achieve the management level of psychological characteristics of the research breakthrough.

2.7 Research assumptions and development of hypotheses

2.7.1 Executive research on the relationship between employee pay gap and future performance

Based on the previous articles on elaborate pay gap incentive effect, as well as domestic and foreign literature, it is evident that most of the current scholars confirmed that there is a real correlation between employee pay gap and organizational performance. However, regarding the direction of influence, debates still exist. In recent years, it has been announced that China's economy will further be pushed forward with supply side and financial reform will be the main focus of deepening reform. The economic state of affairs will be more complex, and technology updates will be more rapid. The result will definitely affect the listing of company executives than the ordinary business executives who need to process more information, resulting in more working stress and energy investment. Therefore, it would be justifiable to give higher remuneration to them. In addition, it is well known that "higher power distance" has a long history in the Chinese society and there are obvious differences in social status and income of enterprises. Therefore, to the executives, the income reward not only indicates its compensation for the contribution of enterprise value but also shows its social status and the advantage of power in the organizations. Numerous scholars such as Wanli and Shaoxiang [2006], Chun et al. [2003], Shin [2008], and Banker et al. [2016] have concluded that the pay gap between executives and employees can indeed motivate managers to improve performance and to work harder improving organizational performance.

However, it is important to pay special attention to the long process in which the pay gap plays a significant role. Management is mainly composed of decision making, planning, organizing, etc. Comparing to other ordinary and technical functions, its timeliness will be longer where the beginning of the implementation to the effect will have a certain time lag. On the other hand, according to the operating conditions, most of the listed firms have developed a salary assignment for the (t+1) year at the end of t (or even earlier). It covers basic salary, performance pay, and bonus income. This program started in the first t+1 year. At the end of the year, according to the actual performance, salary compensation for the executives as a means to define the period of business year's end income remuneration, leading to the first t+1 year pay gap. This pay gap will also affect the management's pay satisfaction and the next year's t+2 year performance. This shows that from the view of time continuity, the T at the end of the year worked out the first t+1 revenue distribution system, the t+1 year generates the economic consequences and pay gap for the remuneration received, and the t+2 year performance of the year has an impact. Therefore, from the perspective of the lag of salary incentives, the relationship between executive pay gap and future performance can be derived through the following hypothesis:

 H_1 : Executive–employee pay gap is positively correlated with the company's future performance, i.e., the greater the pay gap in *T* year, the higher the first *t*+1 enterprise performance level in that year.

2.7.2 Executive research on the relationship between pay gap and management power characterizes future firm performance

Based on management power theory, as managerial power increases, it has the strength and motivation to gain more self-interest through other channels. At this time period, it does not make due contribution to the enterprise value and in more mainstream performance assessment, income compensation to achieve growth is highly unlikely. The income compensation of the ordinary workers has also been misplaced, unreasonably widening the pay gap between the executives and employees. However, this gap cannot only encourage the executives to improve performance but will make ordinary workers feel that their normal income is violated. They have inequitable feelings and dissatisfaction resulting in work slack, idleness, and other negative performance indicators having a bad impact on the organization. In combination with previous hypotheses, the authors think that the incentive lag does still exist when managerial power increases, which led to the following hypothesis:

H₂: The greater the managerial power, the weaker the positive relationship between pay gap and future performance of the enterprise.

This paper uses the executive shareholding ratio and the two-level concurrent indicators to measure management authority features to analyze the moderating effects of variables in the lag of compensation incentive. Higher executive ownership indicates that management is further elevated in the corporate sector and has more clout in voting and designing payroll system. When executives combine dual roles of managers and shareholders, they exacerbate information asymmetry with their clients and increase the likelihood to manipulate their surplus to achieve personal gain. At this point, even if the board managers ensure higher pay gap to stimulate management to work hard, they will not be able to achieve the desired incentive as the equity dividend has already been partially replaced by the original incentive effect of monetary reward along with higher executive shareholding. Up to this point, the executive layer has reached a higher position in addition to getting more paid income. However, if the ordinary workers are not provided with reasonable compensation, the incentive effectiveness will be weakened and the income satisfaction will be declined, creating some negative emotional performance and hindering company's development. In combination with hypothesis 1, it has been assumed that the lag incentive of pay gap still exists under the situation of higher executive shareholding, which leads to the following assumption:

 H_{2A} : The higher the executive ownership, the weaker the positive relationship between pay gap and future performance of the enterprise.

If two positions concurrently such as the Chairman and CEO are held by the same person, in which case his/her managerial authority increases but the board power is reduced, the management-friendly income distribution scheme is easier to pass at board resolutions. Conversely, if the two jobs can be separated where a form of mutual supervision and gaming balance can be enabled, it would save some supervision costs to some extent. It would also help the CEO to reduce some rent-seeking risks where management can effectively restrain its ability to gain wealth through its own power advantage, design a more reasonable as well as scientific salary distribution scheme, improve the salary satisfaction level of the ordinary employees and thus stimulate all the staffs to work hard to create more enterprise value [Wang et al., 2013]. In combination with hypothesis 1, it has been assumed that the lag incentive of pay gap still does exist under the circumstance of two positions, which leads to the following hypothesis:

 $H_{_{2B}}$: Both the Chairman and CEO will weaken the positive relationship between the pay gap and future performance of the enterprise.

2.7.3 Pay gap between executive-employees, management overconfidence characteristics, and future performance

The management overconfidence theory points out that executives, as in the top of the corporate decisionmaking sequence, are more likely to generate overconfidence by virtue of specificity of their positions and advantages of power. In fact, when executives appear to be overconfident, they produce a better than average mentality and tend to control illusion. However, at the same time, management uses their own power to seek greater private interests, manipulate the corporate surplus or custom pay, and run the risk of rent-seeking. However, when the overconfidence of senior management of their own income growth increases, it does not make a contribution to the firm up to same extent. Heaton [2002] and Goel and Thakor [2008] found that overconfident executives tend to be optimistic about the corrections of information they own for expected return, ignoring possible risks. Gervais et al. [2009] argued that overly assertive executives are more likely to attribute higher performance of an organization to their superior talent and decision-making power, creating a negative relationship between business performance and managerial overconfidence. In other words, the higher the managerial overconfidence, the higher the pay gap between executives and ordinary employees but the lower the corporate performance. In combination of hypothesis 1, it has been assumed that the lag incentive of pay gap exists under managerial overconfidence, thus making the third assumption:

H₃: The higher the managerial overconfidence level, the weaker the relationship between executive pay gap and the future performance of the organization.

2.8 Theoretical framework

Considering the above literature works and hypotheses, the following theoretical framework (Figure 1) has been developed for this study:

3 Research methods

3.1 Sample selection

The initial sample size to be used for this study was 2,749. The samples for this study have been derived from "A" categorized firms in China's shanghai and Shenzhen stock exchanges between the years 2016 and 2017. To eliminate the problematic data, the following principles have been adopted:



Figure 1. Theoretical framework of the study.

- The firms with doubtful or problematic financial situation that can influence the overall accuracy of the result have been excluded from the sample.
- The firms having a significant difference in actual and academic standards in their reports have been eliminated.
- The firms with a zero or negative pay gap between employees have been also excluded.
- This article discusses the *t*-year-pay gap effect on the future performance of the firms in the *t*+1 year and requires that data such as compensation level and enterprise performance for each sample in the year 2015 and the two year study period (2016 and 2017) are available. Therefore, the missing samples of the variables involved are also excluded.

After eliminating the problematic, irrelevant, and incomplete samples, the valid sample size has been stood to 1,189.

3.2 Types and sources of data

Secondary data have been utilized for this study. The data source for this article originates from "China Stock market and Accounting Research Database" (CSMAR). In order to ensure the validity of research results, the annual reports of selected firms have been extracted from the database. Finally, 1,189 data have been extracted after filtering initial 2,749 samples. At the empirical analysis phase, data are processed and analyzed using Excel and SPSS 24.

3.3 Design of variables

3.3.1 Future company performance

The explanatory variables involved in this study are first T year (i.e., 2016 executive–employee pay gap) and t+1 year (enterprise performance in 2017). The other variables used are ratio of executives' stock holding and two posts to measure the characteristics of management power. In addition, the characteristics of management overconfidence are measured by the change in management shareholding and the adjustment effects between the two factors on the pay gap and future performance of the enterprises studied. The control variables are the growth of enterprise, technical complexity, capital structure, firm size, and firm and industry nature.

Future enterprise performance has been assumed to be indicated by EPS, which is the result of the efforts of all employees and can be measured by accounting and market index. The former is based on the accounting index of the company in a certain period of time. It is the reflection of the performance of organization such as return on net assets and total asset yield. The latter one is an estimate of the expected performance of business and an assessment of the future value of the enterprise such as Tobin's *Q* value. The previous scholars' metrics to value the future performance of Chinese domestic firms have been depicted in Table 1.

Table 1. Common measures for future performance of domestic (Chinese) firms

Author(s)	Performance metrics
Zhang [2008] and Cao et al. [2016]	<i>t</i> +1 total asset yield for the year
Hou et al. [2016]	<i>t</i> +1 EPS for the year
Chen [2004]	<i>t</i> +1 total asset return and net assets utilization for the year
Lin [2015]	Company future performance (first year, second year, and third years' average performance)
Chen et al. [2005]	The total asset yield of the company in the second year and the average total asset yield for the following 3 years

EPS, earnings per share.

This paper draws on Hou et al. [2016], using t+1 year [2017] EPS, to measure the companies' future business performance. EPS is the core index to measure the value of stock investment reflecting the level of the profit. Therefore, it is more reasonable to use it as a measurement level of enterprise performance. EPS is calculated as follows:

 $EPS = \frac{Final net profit}{Total stock number}$

3.3.2 Management-employee pay gap

Pay gap between executives and ordinary employees has been denoted as Megap. This paper adopts the practice drawn by Lu and Gao [2013] who define the executive–employee pay gap as follows:

Pay gap between executive staff = average executive pay – average employee pay

As required by the formula, we need to define executive compensation and employee compensation separately.

- (1) Executive compensation: The previous measurement indicators of executive pay were diverse. Table 2 indicates the common measures used by the Chinese scholars to measure compensation. Based on the available data and the effectiveness of the indicators, this paper draws on practice of Li et al. [2013] who calculated the pay of first three directors, supervisors, and senior executives.
- (2) **Employee compensation:** Scholars have not yet agreed on a formula for calculating employee remuneration. Table 3 lists several metrics for the current mainstream. In this paper, the authors refer to Chen and Li [2011] and other scholars' metrics for measuring employee compensation:

Employees' compensation = yearly cash paid to employees + total annual remuneration for executives supervisors/total number of executives and employees

3.3.3 Administrative layer power features

Scholars have discussed the features on management authorities that have arisen in recent years. Among them, Finkelstein [1992] first established a model arguing that management power can be divided into the

Author(s)	Compensation indicator metrics
	Logarithm of the average remuneration of the top three directors
Lurui [2007], Zhou et al. [2013], and Wang [2015]	Logarithm of the average remuneration of the top three highest paid executives
Tong and Lu [2005] and Lu and Zhao [2008]	Ratio of total annual salary of directors, supervisors, and senior executives to the total number of salaried executives
Zhang [2008] and Chen and Xu [2001]	Total annual salary of directors, supervisors, and senior executives
Haung and Yao [2013]	The ratio of directors, supervisors, and executives' salaries to the total number of executives
Lu [2014]	Ratio of total annual salary of directors, supervisors, and senior executives to the total number of executives
Kato and Long [2006]	Logarithm of the average remuneration of the top three directors, supervisors, and senior executives

 Table 2. Common metrics for executive pay

organizational structure of power, owner power, expert power, and reputation power. After that, based on this model, researchers began to carry out further investigations. Some adopted multiple metrics, while some others were dependent on a single metric such as large shareholdings [Core et al., 1999] and two concurrent jobs [Cohen and Lauterbach, 2008]. In addition, some scholars took comprehensive indicators to measure management power. Table 4 systematically combines the indicators of management power used by the researchers.

In this paper, based on previous research, the authors choose the executive shareholding ratio (Share) and two posts (Duality) to measure management power:

- (1) **Executive ownership ratio (Share):** The ratio of top managers to total shares. The higher the value, the greater the power.
- (2) **Two posts concurrently (Duality):** When the positions of the chairman and the CEO are held by the same person, the power is considered as greater. When the chairman and the CEO are concurrently the same person, the variable value is 1, otherwise it is less than 1. The higher the value, the greater the management power.

Table 3. Common metrics for employee compensation

Author(s)	Compensation indicator metrics
Philip and Paul [2008]	Cash paid to employees-total management salary/cash received from sales of goods or service
Shen et al. [2013]	Cash paid to employees/average number of employees per year
Fang [2009] and	(Cash paid to workers+employee compensation at the end of the quarter)-(employee
Lu [2014]	compensation at the beginning of the quarter-executive annual pay)/(total employees-executive number)
Chen and Li [2011]	(Cash paid to employees and supervisors-the total annual remuneration of supervisors)/(total number of employees-total number of executives)

Table 4. Common metrics used for management authority

Author(s)	Management power metrics
Bebchuk et al. [2002]	CEO term and number of years of service, board independence, whether the CEO serves as chairman, whether the CEO retires within 2 years, and whether the CEOs are the major shareholders or not
Cheng et al. [2008]	Whether the CEO is the founder, chairman, and sole internal director with a large representation of the right or not
Coombs [2007]	Term of office, shareholding ratio, and two posts concurrently
Lurui [2007]	Second grade, share diversification, and senior executive tenure
Yan et al. [2015], Graham et al. [2017], Grinstein and Hribar [2003], Shin [2008] and Dai [2014]	Years of service as CEO, double duty, equity concentration, and whether the CEO is the founder or not
Schwab and Thomas [2006]	CEO's preference of rights to bargain for
Justin et al. [2016]	Degree of decentralization and concurrent and independent directors ratio
Chen and Li [2008] and Shaojian De and Zhang [2014]	Integration of two posts, internal director ratio, board size, and shareholding ratio of the first major shareholders
Yu [2015]	Unification of two posts, diversification of shareholding, and proportion of management
Becht et al. [2003]	The proportion of control rights, the degree of separation of two rights, and the unification of two posts
Graham et al. [2017]	Unification of two posts, diversification of shareholding, size of board directors, and proportion of independent directors
Long and He [2018]	The number of board, executive title, senior management qualifications, senior management executive ownership, senior management tenure, and stock rights dispersed

3.3.4 Management overconfidence features

Exploring the degree of overconfidence of managers is the key and most difficult part of this study. As overconfidence is primarily a state of psychology, there is hardly any way to link it directly to financial indicators and macro metrics. Nevertheless, scholars are still trying and proposing some substitute variables as summarized in Table 5.

From the point of view of data availability and accuracy, this paper chooses the management shareholding change to measure overconfidence in management. Zhang [2008], Zhu and Tang [2010], Sun and Zhao [2014], Liang et al. [2015], and other Chinese scholars have adopted the management stock change as the indicator of representing the management overconfidence characteristics as desirable.

Management shareholding movements (overconfidence) in a 2-year study period (2015–2016) increase the level of overconfidence in management, at which point the variable takes a value of 1 or 0.

3.4 Control variable design

3.4.1 Enterprise growth (Growth)

Enterprise growth indicates the ability to develop continuously during the future business period. The more mature the firm, the more scientific the design of its pay structure [Brockman et al., 2010; Eisdorfer et al., 2013; Hosain, 2014]. When the goals of the firm and the employees match, it can not only make the employees get the expected income remuneration but also let the enterprise toward the better direction of

Substitution variables	Measurement method	Principle
Management relative compensation	Top three executive compensation/all executive compensation	The higher the management's relative pay, the stronger its ability to control the firm with confidence [Hayward and Hambrick, 1997; Liu et al., 2010; Kang, 2016]
The historical performance of the enterprise	High performance in company's annual reports	Managers tend to attribute high historical performance to their outstanding talent and decision-making power [Bettman and Weitz, 1983; Hayward and Hambrick, 1997]
Mainstream media evaluation	The vocabulary used to collect reports, as shown in self-confidence, optimism and so on with overconfidence, appears robust and reliable	The more number of words describing optimism, the more overconfident they are [Hayward and Hambrick, 1997]
Deviation of enterprise profit forecast	Compare the forecast profit of the enterprise with actual one	The more assertive an executive, the easier it is to estimate its profitability optimistically [Lin et al., 2005; Xia et al., 2014]
Management stock change	Management to increase shareholding	If management is optimistic about the future development of enterprises, it increases their holdings [Carpenter, 1998; Claessens et al., 2002; Malmendier and Tate, 2008]
How often the	Number of merger acquisition	The more assertive executives are inclined to
management implements	decisions made by executives over a	overestimate mergers and acquisitions, the more
mergers and acquisitions	period of time	they are engaged frequently with mergers and acquisitions [Doukas and Petmezas, 2007]
Industry sentiment index	Index interval is 0–1, if >100 is considered as overconfident	The larger the index, the more overconfident the executives are [Zou et al., 2006; Baker and Jeffrey, 2007]
Consumer confidence index	Consumers' estimation of current market situation and subjective perception of consumption psychology	The larger the product value, the more overconfidence the executives represent [Oliver, 2005]

Table 5. Common metrics used for managerial overconfidence

development. This shows that the firm growth changes due to the change in salary structure. The paper takes the total asset growth rate with the following formula:

Firm growth = total assets at the end of the term – opening total assets)/total assets at the beginning of the period

3.4.2 Technical complexity (Tech)

Zhang [2008] found that the increase in technical complexity of the enterprise increases the information processing activities of executive team members, affecting the cooperation demand among them. The cooperation demand can adjust the relationship between the pay gap and enterprise performance. The results found by Li et al. [2008] also point out that when the industry is in a high degree of technical intensity, the vertical pay gap of the executive team will be offset against the performance of the championship. When the technical complexity of the enterprise is higher, the interdependence among the workers will increase, and at this point, the widening pay gap will destroy the cooperative behavior among the workers, thus reducing the cohesion in the teamwork. This negative impact may exceed the expectations of the tournament incentive, thus adversely affecting the performance of the enterprise. Therefore, it is necessary to control the technical complexity. This paper uses the number of research and development personnel accounted for. The calculation formula is as follows:

Technical complexity = number of development/total number of employees

3.4.3 Capital structure (Lever)

Capital structure is an indicator of financing theory based on different financial options such as internal financing, debt financing, and equity financing. When the firm's internal capital is adequate, it is more inclined to use own capital to complement the operational needs. In this case, the ratio of assets and liabilities are kept at a lower level. If the external debt is higher, its day-to-day operations tend to be more cautious, abandon high-risk projects, and depress the wages of employees as far as possible to maintain the stability of the performance or the trend of decline. Based on this, it can be said that the asset–liability ratio does have a certain impact on enterprise performance. Therefore, it is necessary to control the ratio. This paper takes the capital structure (Lever) to represent the asset–liability ratio, which is calculated as follows:

 $Lever = \frac{total \ liability}{total \ assets}$

3.4.4 Firm size (Size)

The theory of economies of scale holds that when the factors such as the land area, production level, and human capital of the firm expand, its day-to-day operation and market transaction cost reduce due to the formation of scale effect. However, the size of expansion also increases difficulty for management. The organization then needs more competent managers to conduct internal control, requiring paying more attractive pay to the executives. At the same time, if the increase in the size of general staff is not really big, it indirectly pulls up the pay gap. Therefore, the size of the firm needs to be controlled. This paper uses the measurement of logarithm of total assets.

Total assets = total fixed assets + total current assets

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3.4.5 Company nature (SOE)

Rosen [1986] believes that in the tournament incentive process, if the participants differ in their own nature, the promotion of the incentive will be different and will interfere with the original allocation of resource efficiency. This phenomenon is particularly evident in SOEs. Owing to the existence of political interference, the promotion opportunity of the internal competition of SOEs does not necessarily depend on the ability to work and performance; rather, it can be obtained through political contract or catering to the preference of superior managers. On the other hand, comparatively speaking, the administrative appointment of the private enterprises is produced from inside, valuing the ability and performance of the employees. On the basis of whether a listed company is a state-owned or a private holding, regardless of its corporate culture, organizational structure or business strategy will have a large difference. Based on this, the nature of the firm will have different effects on the incentive of compensation. Therefore, it is necessary to know the nature of the firm. If it is a fully state-owned firm, the variable takes the value as 1, otherwise it is 0.

3.4.6 Industry (Ind)

The same industry, which is affected by risk, profit patterns, competitive strength, and corporate performance, will provide different results. Based on this, this paper, in the discussion of enterprise performance, needs to fully consider the industry difference. Therefore, industry factors need to be controlled. This article adopts the industry classification standard with the value of manufacturing firms as 1; if otherwise, the value is 0.

3.4.7 Variable tools

To sum up, all the variables selected are shown in Table 6.

3.5 Regression model

In order to test the previous hypotheses, the following regression models have been established:

3.5.1 Model 1

$$\begin{split} EPS &= \alpha + B^{1*}Megap + \beta^{2*}Share + \beta^{3*}Duality + \beta^{4*}-Overcon + \beta^{5*}Growth + \beta^{6*}Tech + \beta^{7*}Lever + \beta^{8*}Size \\ &+ \beta^{9*}SOE + \beta^{10*}Ind + \epsilon \end{split}$$

3.5.2 Model 2

$$\begin{split} EPS &= A + \beta^{1*}Megap + \beta^{2*}Share + \beta^{3*}Duality + \beta^{4*}Overcon + \beta^{5*}Megap*Share + \beta^{6*}Growth + \beta^{7*}Techb\beta^{8*}Lever \\ &+ \beta^{9*}Siz + \beta^{10*}SOE + \beta^{11*}Ind + \epsilon \end{split}$$

3.6 Explanation

Model 1: As the variable is EPS, the explanatory variable is Megap, and the incentive effect of the executive– employee pay gap on the future performance of the enterprise is studied.

Model 2: As the variable is EPS, the explanatory variable is Megap and interaction Megap*Share. Megap*Share is an interactive term between executive–employee pay gap and executive shareholding ratio, which is used to examine the regulatory role of managerial power in listed enterprises between executive–employee pay gap and enterprise future performance.

Table 6. Variable tools

Variable type			Variable code	Measurement formula
Explained variables	Future performance of the firm		EPS	Final net profit/total number of closing units
Interpreting variables	Pay gap between empl executives	Pay gap between employees and executives		LN (average remuneration for directors, supervisors, and top three employees- average pay for general employees)
Adjusting variables	Management power characteristics	Executive shareholding ratios	Share	Total executive stock holdings/total number of shares
		Two posts concurrently	Duality	If the chairman and general managers concurrently hold two posts, the value is 1; otherwise, it is 0
	Management power features Management overconfidence features	Management holdings Changes	Overcon	If the management holdings increased during the 2-year research period, the value will be 1; otherwise, it is 0
Control variables	Growth of enterprise		Growth	(Final total assets-opening total assets)/ opening total assets
	Technical complexity		Tech	Total number of developments/total employees
	Capital structure		Lever	Total liabilities/total assets
	Enterprise scale		Size	LN (year-end total assets)
	Company nature		SOE	The value of state-owned firm is 1; otherwise it is 0
	Industry		Ind	The value of manufacturing industry is 1; otherwise, it is 0

EPS, earnings per share; Megap, pay gap between executives and ordinary employees; SOE, state-owned enterprise.

4 Empirical findings and analysis

Based on the theoretical foundation and research design, empirical analysis has been conducted using descriptive statistics. This paper explores the deferred effect of pay gap on the future performance of the firm with the help of Parson's correlation and multivariate linear regression. After this, the authors try to test the relationship between the ratio of executive shareholding, two posts, and management shareholding. Finally, a robustness model has been established to verify the accuracy of the above discussion and further enhance the rigor of the research design.

4.1 Descriptive statistical analysis

4.1.1 Descriptive statistics for samples

The study makes a statistical analysis of industry distribution of sample firms as shown in Table 7.

In valid 1,189 sample data, the number of manufacturing companies is 933 (78.5%), followed by information transmission, software, and information technology services 80 (6.7%) and the wholesale and retail industry 34 (2.9%). The minimum sample for accommodation and catering and education is 1 each with a ratio of 0.1%. This reflects in Shanghai and Shenzhen A shares of listed firms; the manufacturing firms accounted for the bigger portion, while information transmission, software, and information technology services industry is also raising inline currently to pursue the economic status quo.

4.1.2 Descriptive statistics on variables involved

All the model variables involved with this descriptive statistics have been highlighted in Table 8.

In Table 8, the average EPS of listed firms is 0.32, a bit above the median value (0.21), indicating that most firms have higher after tax profits per share and better profitability ratio. However, the maximum value is 14.27, while the minimum value is –3.12, showing a substantial gap between the firms' profit level.

Executive pay gap between employees (Megap) has a range of 10.75 and 16.09. Although it is the result of the pay gap after the logarithm, it is still able to a certain extent to show current China's listed enterprises where the pay gap is relatively large, reflecting the practical significance of research regarding the salary gap.

Executive ownership ration (Share) is 11%, which is much higher than the median value (1%), showing that most of the listed companies have higher executive shareholdings. However, the range is 0.00% to 70.00%, indicating a large disparity in the proportion of executives held by different companies.

Holding two positions concurrently (Duality) and management shareholding movements (Overcon) are virtual variables with the maximum and minimum values of 1 and 0.

Industry code	Industry type	Number of firms	Percentage
В	Mining	30	2.5
С	Manufacturing	933	78.5
D	Electricity, heating, gas, and water production and supply	18	1.5
E	Construction	29	2.4
F	Wholesale and retail trade	34	2.9
G	Transportation, warehousing, and postal services	13	1.1
Н	Accommodation and catering	1	0.1
1	Information transmission, software, and information technology	80	6.7
К	Real estate	12	1
L	Leasing and business services	9	0.8
Μ	Scientific research and technology	9	0.8
Ν	Water conservatory, environment, and public facilities management	6	0.5
Р	Education	1	0.1
Q	Health and social work	2	0.2
R	Culture, sports, and entertainment	12	1

Table 7. Industry distribution of samples

Table 8. Variables involved in descriptive statistics

Variable	Full sample						
	Average	Medium	Standard deviation	Minimum value	Maximum value		
EPS	0.32	0.21	0.63	-3.12	14.27		
Megap	13.26	13.22	0.65	10.75	16.09		
Share	0.11	0.01	0.16	0.00	0.70		
Duality	0.24	0.00	0.43	0.00	1.00		
Overcon	0.20	0.00	0.40	0.00	1.00		
Growth	0.22	0.12	0.47	-0.38	8.55		
Tech	14.23	11.29	12.97	0.00	85.53		
Lever	0.43	0.41	0.19	0.04	1.04		
Size	22.39	22.24	1.12	19.21	27.83		
SOE	0.41	0.00	0.49	0.00	1.00		
Ind	0.78	1.00	0.41	0.00	1.00		

EPS, earnings per share; Megap, pay gap between executives and ordinary employees; SOE, state-owned enterprise.

Enterprise growth (Growth) is 0.22, which is significantly higher than the median value (0.12), showing that most of the listed firms in China have strong development power. However, the range is -0.38 to 8.55, indicating that there is a big gap in the sustainable development potential of various firms.

Technological complexity (Tech) has the average value of 14.23, which is well above the median value of 11.29, indicating that the research and development personnel of the listed firms are higher in number than the whole samples. The range is 0.00 to 85.53, showing that there is a significant gap between the research and development technicians in different enterprises, which may be related to the industry in which they belong. In general, the ratio of research and development personnel in the information transmission, software, and information technology services industry is much higher than that in other industries.

Capital structure (Lever) is 43%, describing that the ratio of current assets and liabilities of "A" listed firms is reasonable. The minimum value is only 4%, but the maximum value is 104%, indicating the debt ratios in different enterprises.

Enterprise size (Size) is 22.39, and the median value is 22.24, indicating that the asset scale distribution of the firms listed in Shanghai and Shenzhen stock exchanges is more balanced.

For a clearer understanding of the relationship between executive–employee pay gap and future performance of the firms, the EPS and Megap have been divided into descriptive statistics for the industry as detailed in Table 9.

From the point of future performance indicator, EPS of P (education) has the largest value, i.e., 0.70, followed by K (real estate), which is 0.63. The smallest value is of the mining industry (B), which is 0.06. From the point of mean value of pay gap (Megap), the real estate (K) has the biggest value of 14.33, followed by culture, sports, and entertainment (R) having the value of 13.59; the mining industry (B) has the smallest value, which is 13.12. It can be observed that regarding pay gap and future performance, there is a certain correlation between high profit level and pay gap. In case of lower profitability industry like mining, the gap is correspondingly smaller. In fact, it reflects that the future performance of the enterprise and the executive pay gap are linked. However, to answer the questions such as how do they affect each other, how do they affect the direction, or are there any factors affecting the relationship, further exploration is needed.

4.2 Correlation statistics analysis

Before returning to further analysis, we need to test the internal dependencies between the variables involved, as shown in Table 10.

Industry		EPS		Megap			
-	Average	Minimumvalue	Maximum value	Average	Minimumvalue	Maximumvalue	
В	0.06	-2.17	0.74	13.12	11.99	14.23	
С	0.31	-3.12	14.27	13.22	11.12	16.09	
D	0.41	0.02	0.95	13.14	12.45	13.94	
E	0.39	0.05	1.37	13.33	10.75	14.42	
F	0.40	-0.32	3.16	13.59	12.45	14.84	
G	0.36	0.19	0.82	13.24	12.52	14.43	
Н	0.49	0.49	0.49	13.43	13.43	13.43	
I	0.35	-0.48	2.25	13.46	12.25	15.09	
К	0.63	0.19	1.44	14.33	13.34	15.57	
L	0.41	0.04	1.63	13.38	12.60	14.47	
Μ	0.20	-0.51	0.72	13.45	12.56	14.58	
Ν	0.44	0.12	1.27	13.03	12.54	13.43	
Р	0.70	0.70	0.70	13.25	13.25	13.25	
Q	0.36	0.16	0.56	13.24	13.19	13.28	
R	0.51	0.05	1.06	13.59	12.78	15.17	

Table 9. Descriptive statistics of dependent (EPS) and independent variables (Megap)

EPS, earnings per share; Megap, pay gap between executives and ordinary employees.

Variables	EPS	Megap	Share	Duality	Overcon	Growth	Tech	Lever	Size	SOE	Ind
EPS	1										
Megap	0.248**	1									
Share	-0.026	-0.064*	1								
Duality	0.000	0.001	0.258**	1							
Overcon	0.020	0.035	0.203**	0.060*	1						
Growth	0.090**	0.073*	0.175**	0.079**	0.156**	1					
Tech	-0.014	0.057*	0.232**	0.092**	0.106**	0.156**	1				
Lever	-0.084**	0.026	-0.304**	-0.113**	-0.092**	-0.042	-0.246**	1			
Size	0.208**	0.347**	-0.263**	-0.141**	-0.003	0.044	-0.229**	0.540**	1		
SOE	0.043	-0.037	-0.512**	-0.284**	-0.204**	-0.186**	-0.178^{**}	0.311**	0.290**	1	
Ind	-0.027	-0.123**	0.024	0.024	-0.066*	-0.027	-0.150**	-0.147**	-0.232**	-0.071^{*}	1

*p<0.05 at two tailed.

**p<0.01 at two tailed.

EPS, earnings per share; Megap, pay gap between executives and ordinary employees; SOE, state-owned enterprise.

In Table 10, the Pearson correlation factor shows that correlation coefficient of internal variables is less than 0.8, indicating that the variables used in this model do not have multiple collinearity and the next level of the study can be carried out.

First, EPS and Megap are significantly (1%) related at this level, having a Pearson correlation factor of 0.248. This validates H_1 , describing there is a positive correlation between employee pay gap and future performance of the firm.

Second, Growth, Lever, Size, and EPS are significantly interrelated (1%) at this level, having the values 0.090, -0.084, and 0.208, respectively, indicating that the selection of control variables is reasonable and that these variables can indeed affect future performance of the enterprise.

In addition, Share and Megap are significantly (5%) related, having a value of -0.064, showing that there is a certain degree of correlation between executive ownership ratio and pay gap. At the next level of this analysis (regression analysis), the authors have attempted to find the influence of management authority and management overconfidence on the relationship between pay gap and corporate performance.

4.3 Linear regression analysis

4.3.1 Regression analysis between the ratio of executive stock holding and the relationship between pay gap and future performance

Executive pay gap between employees (Megap) is an explanatory variable and future performance (EPS) is the dependent variable that has added interactivity to the model. To explore the management power characteristics of the executive stock ratio to pay gap incentive adjustment effect (Megap*Share), the following regression analysis has been conducted (Table 11).

Table 11 shows that change in R^2 values are 0.104, 0.022, and 0.004, respectively, indicating the fitting of the model is acceptable. Additionally, the significance of *F* has changed to 0.021, which is less than 0.05, indicating that the model has passed the *F*-test and is statically significant. In this study, the VIF value is used to analyze the collinearity problem among the variables. As it can be seen from Table 11, the VIF values are far below 5, indicating that no multiple collinearity among the variables were involved.

Megap's beta value is significantly positive, and the coefficients are 0.158 and 0.149, indicating that its pair EPS represents a significant positive impact on future performance, matching the tournament theory. Therefore, H_1 (the higher the salary gap, the higher the level of future performance of the firm) is supported. In addition, Megap*Share has a significant negative moderating effect on the future performance of the enterprise, indicating that when the proportion of senior executives in a listed company rises, it weakens the positive relationship between the salary gap and corporate future performance, supporting H_{14} .

Predictor variables	EPS						
	Model 1	Model 2	Model 3	Variance Inflation Factor			
Step 1: Control variables							
Growth	0.097*	0.094*	0.096*	1.074			
Tech	0.000	-0.001	-0.001	1.192			
Lever	-0.922***	-0.821***	-0.802***	1.571			
Size	0.197***	0.151***	0.148***	1.853			
SOE	0.055	0.078	0.079	1.476			
Ind	0.026	0.033	0.032	1.114			
Step 2: Interpreting variables							
Megap		0.158***	0.149***	1.252			
Share		0.003	-0.035	1.478			
Step 3: Adjusting variable							
Megap*Share			-0.441*	1.058			
Step 4: Predictor variables							
R ²	0.104	0.125	0.129	Durbin-Watson1.410			
F	22.788***	21.159***	19.470***				
Change in R ²	0.104***	0.022***	0.004*				

Table 11. Executive ownership ratio, pay gap, and future performance of the enterprise

*p<0.05 at two tailed.

*******p*<0.01 at two tailed.

***p<0.001 at two tailed

EPS, earnings per share; SOE, state-owned enterprise; Megap, pay gap between executives and ordinary employees.

The results show that, as a measure of managerial power characteristics, the ratio of executive stock ownership can really play a role in the relationship between pay gap and future performance, and this is a weakening effect. As the company's senior executives, their professional competence and internal information superiority are the cornerstones of leading the development of enterprises; as shareholders, they can express their opinions and exercise their power in the general meeting of shareholders. Comparing to the simple salary incentive, the advantage (for the executives only) of the equity dividend is that the senior executives can use their own identity advantages to decide the company's decision or even to set the salary, which will lead to the reduction of the incentive effect of monetary reward, thus making the organization's performance target difficult to achieve. In addition, when the ratio of executive stock is higher, the pay gap between ordinary employees and senior executives is actually widening. If the company does not "share" a certain stake to the employees, then it will inevitably breed dissatisfaction; when this is not satisfied with the unfair feelings of money to bring the incentive effect, workers will appear slack, "idle", and so on; even if executives work hard, they still have a negative impact on business performance.

4.3.2 The regression analysis between holding two positions concurrently and the relationship between pay gap and future performance

Since the value of the two posts (duality) is 1 and 0, it is not possible to add interaction items directly to the regression model when studying the moderating effect of the power characteristics of the management layer. According to the statistical principle, using the method of Liu and Sun [2010], the samples are divided into two groups: "two-post-concurrent group" and "non-two-post-concurrent group". After putting the two sets of data into the model, the following results have been discovered.

From the regression results of Table 12, it can be seen that the change in R^2 values are 0.188 and 0.130, respectively, which indicates that the fitting degree of the model is acceptable. In addition, the significant *F* change is 0.000, which is below 0.05, indicating that the model passed the *F*-test and is statistically significant. In this study, the VIF value is adopted to analyze the collinearity problem among variables, and

Variables	Two posts concurrently			Non two posts concurrently		
	Coefficient	Significance	VIF	Coefficient	Significance	VIF
Constant	-3.326***	0.000		-5.393***	0.000	
Megap	0.088*	0.037	1.366	0.181***	0.000	1.200
Growth	0.173**	0.002	1.161	0.065	0.152	1.045
Tech	-0.001	0.679	1.279	-0.002	0.354	1.151
Lever	-0.425**	0.007	1.531	-0.937***	0.000	1.520
Size	0.123***	0.000	2.055	0.161***	0.000	1.784
SOE	-0.026	0.703	1.249	0.110*	0.017	1.162
Ind	-0.136*	0.038	1.197	0.082	0.129	1.105
<i>R</i> ²		0.188 0.13		0.130		
F		9.236*** 19.088***				
Change in R ²		0.188***	0.188*** 0.130***			

Table 12. Executives holding two posts, pay gap, and future performance of the enterprise

*p<0.05 at two tailed.

*******p*<0.01 at two tailed.

****p*<0.001 at two tailed.

Megap, pay gap between executives and ordinary employees; SOE, state-owned enterprise; VIF, variance inflation factor

it can be seen from Table 12 that the VIF value of each variable is far below 5, which indicates that there is no multiple collinearity among the variables involved.

In the regression model of the two-post group, Megap's beta is positive, with a coefficient of 0.088, indicating a positive correlation between the executive–employee pay gap and future performance as the chairman and CEO. After controlling other variables, Megap can increase EPS by 0.088 per 1%. In the regression model of the two-post group, Megap's beta is also positive, with a coefficient of 0.181, indicating a positive correlation between the executive-employee pay gap and future performance in the separation of the chairman and CEO posts. In this case, after controlling other variables, for every 1% Megap, the EPS can be increased by 0.181%. The regression results of both sets of data support the tournament theory, supporting H₁ again.

By comparing the β value of the Megap of two sets of data, we can find that the beta value (0.181) in the regression model of the second-grade group is much higher than the beta value (0.088) in the regression model of the two-post group. Such results indicate that whether or not two roles exist in the incentive to pay gap, there is a certain difference. When the chairman and CEO is the same person, it will weaken the pay gap to the future performance incentive. Therefore, H_{2R} is supported.

The results show that the two posts, also as another measure of managerial power, can indeed regulate the relationship between the pay gap and the future performance of the firm, and this is a weakening effect. When the chairman and CEO is the same person, management power increases and board independence is lowered, meaning that the management-friendly income distribution scheme makes it easier to pass the board's resolution, indicating that executives can get higher monetary rewards. In addition, management has the strength and motivation to obtain more wealth through other channels, such as manipulating salaries and rent-seeking. However, if the management does not offer some compensation to the ordinary workers, the positive pay incentive attitude will be greatly reduced, employee satisfaction to pay will be lowered, and even some emotional negative behavior might arise, thus affecting the company's development.

4.3.3 Regression analysis between management overconfidence (stock change) and the relationship between pay gap and future performance

Since the value of management shareholding movements (Overcon) is also between 1 and 0, it is not possible to add interaction items directly to the regression model when studying the regulatory role of

overconfidence represented by the management. Consistent with the test of $H_{_{2B}}$, the data are divided into two groups: the management overconfidence group and the non-management overconfidence group. Then, the two sets of data are put into the model for analysis. The regression results are shown in Table 13.

Megap, pay gap between executives and ordinary employees; SOE, state-owned enterprise.From the regression results of Table 13, it can be seen that the change in R^2 values are 0.098 and 0.132, respectively, which indicates that the fitting degree of the model is acceptable. In addition, the value of significant *F* is changed to 0.001 and 0.000, having the value less than 0.05, indicating that the model passed the *F*-test and is statistically significant. In this study, the VIF value is used to analyze the collinearity problem among variables, and it can be seen from Table 13 that the VIF values of each variable are far below 5, which indicates that there is no multiple collinearity among the variables involved.

In the regression model of the management overconfidence group, the β value of Megap was positive and the coefficient was 0.125, which meant that there was a positive correlation between the executive– employee pay gap and the future performance of the enterprise with overconfidence in management. After controlling other variables, 1% increase in the Megap value can increase the EPS by 0.125%. In the regression model of the non-management overconfidence group, Megap's beta value is also significantly positive, with a coefficient of 0.164, indicating that there is no overconfidence within the management and there is still a positive correlation between the executive–employee pay gap and future performance. In this regard, after controlling the other variables, 1% increase in the Megap value can increase the EPS by 0.164%. The regression results of both sets of data support the tournament theory, validating H, again.

By comparing the Megap beta values of the two sets of data, we can find that the beta value (0.164) in the regression model of the overconfidence group is much higher than the beta value (0.125) in the regression model of the management overconfidence group. This shows that the management of excessive self-confidence on the incentive to pay gap has a certain difference in the impact. When the internal management shows overconfidence, it will weaken the pay gap in the future performance of the positive effect. Therefore, H_3 is supported.

The result shows that the change in management shareholding is a measure of overconfidence of management, which can influence the relationship between pay gap and future performance and is a kind of weakening effect. When management overconfidence increases, it will produce a "better than the average" mentality and will tend to "control illusion". As a result, management will use their identity advantage to gain more personal benefits. However, at this time, managers do not create more value for the company. If the ordinary employees will not be paid sufficient compensation, the executive–employee pay gap will be indirectly widened and pay to the staff incentive will be weakened, resulting in negative behavior of employees, which will finally damage the corporate performance.

Variables	Management overconfidence			Non-management overconfidence		
	Coefficient	Significance	VIF	Coefficient	Significance	VIF
Constant	-3.425***	0.000		-5.097***	0.000	
Megap	0.125**	0.004	1.214	0.164***	0.000	1.242
Growth	0.052	0.0281	1.046	0.108*	0.023	1.059
Tech	-0.001	0.561	1.285	-0.001	0.729	1.154
Lever	-0.386*	0.041	1.767	-0.908***	0.000	1.521
Size	0.101*	0.015	1.948	0.158***	0.000	1.879
SOE	0.022	0.739	1.136	0.093*	0.040	1.204
Ind	1.886	1.000	1.209	0.052	0.333	1.105
R ²		0.098			0.132	
F		3.646***		20.319***		
Change in R ²		0.098**		0.132***		

Table 13. Management share change, pay gap, and future performance of the enterprise

*p<0.05 at two tailed.

***p*<0.01 at two tailed.

***p<0.001 at two tailed.

4.3.4 Adjustment effect diagram

Based on the shareholding ratios held by the executives, the following diagram (Figure 2; also see Table 14) has been developed. However, it should be noted that such corresponding diagram can be made only for the first adjustment.

4.3.5 Summary of validation of hypotheses

By collating and analyzing the collected data, the hypothesis is tested by multivariate linear regression method. The test results of the five research hypotheses are shown in Figure 3 and Table 15.

Considering the above literature works and hypotheses, the following theoretical framework has been developed for this study:

4.4 Summary of the findings

In the descriptive statistics of the research data, Pearson and multivariate linear regression analysis, it is found that the relationship between pay gap and the future performance of the enterprise accords with the tournament theory and the relationship between management power and overconfidence is weakened. The results show that the five research hypotheses mentioned earlier are all well supported. After the robustness model test, it has been found that the hypotheses are still valid, which shows that the regression model constructed by this research study has good robustness.

5 Theoretical and rational significance of the study

Based on the information of listed companies in Shanghai and Shenzhen stock exchanges, this paper has studied the diversified effects of the pay gap between senior executives and employees on firms' future performance and has verified the applicability of the tournament theory and behavioral theory in Chinese perspectives. The sample covered a wide range of industries including manufacturing, IT, software,





X coefficient Constant Low executive share-**M** coefficient X*M M value X value Low executive shareholding ratio holding Ratio -2.726 0.149 10.750 -0.34208 -1.90642-0.035-0.441-0.1640.16378 16.09 0.839274 -1.49645

Table 14. Adjustment effect for the executive shareholding ratio



p<0.01 at two tailed. *p<0.001 at two tailed.

Figure 3. Depiction of validation of hypotheses through theoretical framework.

technology, and real estates in order to fully understand the impact of executive–employee pay gap on the organizations' future performance of a certain value. The salary gap and the performance data have been considered on a (*t*+1) basis to study the effect of the salary gap of T year on the performance. Since in the real environment, the pay results of the economic consequences have a certain time interval, the future performance data usage can be influenced by the performance on the enterprise distribution and formulation, ease of endogenous interference between the salary, and the use of performance section data in order to find out the deferred effects of the salary gap and future performance. In exploring the deferred effects of pay gap, managerial overconfidence and power have been added as moderating variables that are quite different from those in the previous studies from the viewpoints of organizational internal and external environments. At present, the influence of management characteristics such as managerial power and overconfidence on the internal pay gap is seldom involved in literature, particularly on the organizational performance. In this paper, the managerial power is measured by the ratio of executive shareholding and holding dual positions. On the other hand, managerial overconfidence is measured by the change in managerial shareholding.

In an ordinary view, excessive pay gap as the key link in the enterprise salary arrangement and design would destroy the enthusiasm of the staffs, reduce the cohesion of the organizational teamwork, and affect the level of performance negatively. It also causes internal staff slack and free rider of negative behavior. Therefore, the effective use of the appropriate pay gap to maximize the performance is the focal point and hotspot in business circles and is a difficult problem to be solved urgently. The salary distribution within the firms belongs to the social allocation of resources that not only is related to the satisfaction of the individual but also concerns whether the society can balance the fairness and equity. The reports of "Sky high" income of senior executives and slow increase in income level of workers are not uncommon. Therefore, how to ease the construction of income distribution gap is a higher ranked priority for the management planners of the government.

Hypotheses	Content	Verified or not
H ₁	Executive—employee pay gap is positively correlated (0.248) with the firm's future performance, i.e., the greater pay gap in t the year (the first <i>t</i> -1), the higher the performance level in that year.	Verified
H ₂	The greater the management power, the weaker (-0.441) the positive relationship between employee pay gap and future performance	Verified
H _{2A}	The higher the percentage of executive ownership, the weaker (-0.035) the positive relationship between pay gap and firm future performance	Verified
H _{2B}	Chairman and general manager holding two posts concurrently weaken (-0.164) the positive relationship between pay gap and firm future performance	Verified
H ₃	The higher the level of management overconfidence, the weaker (-3.425) the positive relationship between pay gap and firm future performance	Verified

Table 15. Validation of hypotheses

6 Conclusions, limitations, and future research directions

6.1 Research conclusions

Based on the data analysis results of the previous chapter, the conclusions of this study are extracted and the countermeasures are proposed. This paper reviews the shortcomings of this study and then points out the direction of future research.

6.1.1 Tournament theory is better for explaining the relationship between pay gap and future firm performance

At present, the internal executive-employee pay gap in Chinese listed enterprises has a significant positive impact on the future performance of the enterprise, which shows that the tournament theory is more suitable to explain the salary incentive among senior executives-employees in Chinese perspective. The authors believe that there are two reasons leading to this positive relationship. First, this may be related to China's current economic environment. In recent years, the speed of China's labor market development and the competition between workers has gradually become normal inside the company. Whether it is a senior manager or the general staff, a slight lag in performance may be eliminated. To make someone irreplaceable, he/she needs to have strong performance and cutting-edge innovative thinking. Second, the difference in salary compensation can satisfy the manager's "vanity" psychology and stimulate the staff's achievement desire. On one hand, the high income and high positions that managers can provide them with enough superior psychology allows management to take the initiative, maintaining a state of passion in front of ordinary workers. On the other hand, when workers realize that the pay gap between themselves and management has not reached the "unattainable" level, their desire for success will grow with full passion and outstanding performance. This shows that within the listed companies, the tournament theory can better explain the incentive effect between the executives and the staff, while the compensation scheme makers can use this feature to design the reasonable pay gap.

6.1.2 Management power negatively affects executive incentives for employee pay differentials

Under the influence of different management power characteristics, the pay gap has a weakening effect on the future performance of the enterprise. In particular, the increase in the ratio of executive shareholding and the incentive effect of the two positions will reduce the salary gap. This shows that the

level of internal management power of the enterprise does have a role in the future performance of the enterprise. When the management power expands, executives have the motivation and ability to obtain more wealth through other channels, such as manipulation of pay and rent-seeking. However, if the company does not give ordinary workers certain compensation, the salary incentives for workers will be greatly reduced; the employee's income satisfaction will decrease and can even show some of negative emotional behavior. At this time even if the senior executives work hard, they will have a negative impact on the organization's operating performance due to lack of commitment and teamwork from the ordinary employees.

6.1.3 Overconfidence in management has a negative impact on pay differentials

As a measure of the overconfidence of management, the change in management stock ownership can actually adjust the relationship between the pay gap and the future performance of the enterprise, which actually is a weakening effect. When management is overconfident, it produces a "better than average" mentality and tends to "control illusion". In this case, management will use their power to grab more wealth. However, when overconfident executives grow their own wealth, they do not contribute to the improvement of corporate value. At this time, if the ordinary workers are not given a certain amount of additional compensation, the salary gap between the executives and the staff will be indirectly expanded. This will weaken the incentive motivation, leading to negative work performance of ordinary workers, which is not conducive to enterprise development.

6.2 Research limitations and further scope of study

Owing to the authors' academic level and energy constraints, this study still has a few deficiencies that indicate that future investigations can be further strengthened in these areas mainly with the following three points:

- 1. First, due to the impact of data availability, this paper only uses management stock changes to measure overconfidence level. However, some scholars use the earnings forecast deviation, management relative compensation, and the company's annual report of 3 years. The other indicators may still have possibly to be excavated from other management layer overconfidence variables. The selection of the index may produce some error to the research results. The next step is to explore other overconfidence indicators to test their adjustment effects on the pay gap and future performance of the enterprise and strive to show the overall management of overconfidence.
- 2. Second, scholars can easily ignore the influence of salary decision and issuance process on employee's income satisfaction. The present study indicates that only the result of income distribution is fair and the effect on procedure fairness is less. This will give higher requirements to the scholars who will continue to be deep in the field in the future. It is necessary to collect more valuable data from the field research and draw more convincing conclusions.
- 3. Third, the research in this field takes the listed enterprises as sample and the proportion of these enterprises is changed by the SOE. It continues the characteristic of the extensive participation of the government, leading to the centralization of the management power and the deep influence on the operating performance. Therefore, the future research needs to put the corporate politics, administrative damages, and other disturbing factors into the research model, which will enhance the accuracy of the research results of executive pay to some extent. At the same time, the collection of sample data from private enterprises and family enterprises should also be considered. Last of all, the study was conducted considering the data for only 2 years. It could have provided more interesting results if more years would have been incorporated.

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