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# Management Gender Diversity, Executives Compensation and Firm Performance -- Evidence from Growth Enterprises Markets (GEM) Listed Companies in China

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**Abstract**

**Purpose** – This paper contributes to the discussion on the executives' team and firm performance by investigating the relationships between executives' compensation, management gender diversity and firm financial performance in GEM listed firms in China.

**Design/methodology/approach** – Data are collected from 461 companies listed on GEM boards during the period from year 2016 to 2018. Specifically, executives' compensation and female executives are set as the independent variables, and the proxy selected of corporate performance is Tobin's Q ratio.

**Findings** - The results show that the correlation between corporate performance and executive cash payment is not significant, while executives' equity-based compensation shows a significant positive correlation with firm performance. In addition, the participation of female executives is negatively associated with firm performance.

**Implication** – The results have practical implications for governments, policymakers, and regulatory authorities, by indicating the importance of women to corporate success. In particular, the findings of this paper emphasize the specific background of GEM in China and provides empirical support for the value of women's participation in corporate governance. In addition, the finding on the relationship between executive compensation and corporate performance of GEM listed companies provides guidance for the establishment of performance compensation system of GEM listed companies in China.

**Originality / value** – This paper provides new evidence for the current literature of executive's team and corporate performance. This is the first paper to adopt triangulation in theories from different disciplines including optimal contractual approach, managerial power approach as new perspectives of agency theory, upper echelons theory, motivational-hygiene theory and women leadership style theory. The results will contribute to provide guidance for enterprises to formulate an efficient compensation system and build a reasonable senior management team structure.

***Key words*:** Gender diversity; Executives' compensation; firm performance; Chinese GEM listed firms

## 1. Introduction

Corporate governance is a mechanism that shareholders use to monitor firm executives to minimize agency costs (Caskey and Laux, 2017; Zhang et al., 2019). The relationship between executive remuneration and corporate governance has been well documented in the previous literature (Core et al., 1999; Firth et al., 2007; Zhong et al., 2014; Baixauli-Soler and SanchezMarin, 2015; Deschenes et al., 2015; Siddiqui, 2015; Ntim et al., 2017; Zhang and Zeng, 2019). Also, the relationship between executives' pay and firm performance has always been a topic of considerable controversy in the corporate governance literature (for example, Ahmadi et al, 2018; Catalyst. 2014; Dan, 2013; Ntim et al, 2015). These previous studies have investigated the sensitivity of executive compensation/pay to firm performance (Lippert and Porter, 1997; Schaefer, 1998; Mohan and Ainina, 2012; Dai et al., 2014; Yang and Hou, 2016; Wei et al., 2017; Zhou et al., 2017). Cordeiro et al. (2013) find that Chinese executives are rewarded more for positive accounting performance than they are penalized for negative accounting performance. Using a large South African data set, Ntim et al. (2017) find that CEO power and corporate governance structure have a moderating effect on the executive compensation performance sensitivity. They reveal that the sensitivity is higher in firms with more reputable, founding and shareholding CEOs, higher ownership by directors and institutions and independent nomination and remuneration committees, but lower in firms with larger boards, more powerful and long-tenured CEOs. More studies have investigated executive compensation, showed that remuneration is critical in firm performance, and executive compensation appears to be positively associated with corporate performance (Ataay et al, 2018; Conyon Martin, 2014; Schultz, Tian, & Twite, 2013). These studies mention that the relationship between executive compensation and corporate performance is driven from agency theory (Bebchuk and Fried, 2003). Under agency theory, a reasonable and effective compensation structure can align the interest of managers with those of shareholders and reduce the agency cost (He, Wan & Zhou, 2014). Therefore, formulating an efficient compensation system is of great significance for organizations.

Another dimension of modern economy is the gender difference of senior executives that plays a critical role in enterprises. Some empirical studies have shown that women's decisions are more vigilant than those of men (Levi et al., 2014; Ain et al., 2020). For instance, female directors request more in-depth audits (Gull et al., 2011); are tough monitors (Adams and Ferreira, 2009), enhance perceptions and experiences that result in increased board decision quality with improving the firm's legitimacy (Hillman et al., 2007; Bernile et al, 2018), improve the company image by helping recruit top female employees (Gul et al, 2011); develop the firm's external legitimacy by attracting talented employees (Hambrick, 2007) and help in increasing earnings quality and accounting conservatism (Garcia-Sanchez et al., 2017). Also, Faff et al., (2011) study suggests that women on boards change the group dynamics of communication, interpersonal interaction and decision-making in a positive way. This leads to more creative, innovative and non-traditional decisions and better board performance.

In addition to the above, some researchers have focused on the economic benefits of female directors in the boardroom by studying the association of gender diversity and firm performance, but their findings have provided mixed results (Adams and Ferreira, 2009; Liu et al., 2014; Post and Byron, 2015; Singhathep and Pholphirul, 2015; Flabbi et al., 2019). Numerous empirical studies have shown that gender diversity on the board has economic benefits and changes boardroom dynamics. For example, female directors are more operation-focused than male directors (Adams and Ferreira, 2009). Female participation on the board also sometimes provides contradictory views due to which discussions of complex decisions on the board are improved (Gul et al., 2011).

Based on the above discussion, we noticed that previous literature offers relatively little guidance to China, since corporate governance in China is significantly weaker than that in the developed countries (Allen et al., 2005). Furthermore, there are still a series of problems in Chinese firms, such as low representations of gender diversity and unequal distribution of key positions (Liu et al, 2014). Therefore, research on gender structure of senior executives becomes the key to further realize gender equality and optimize the structure of senior executives and still can be considered as desired research area in China. We believe with the rapid development of social economy in China, female executives are currently taking more on the business world and realizing their personal value. However, the effects of gender diversity on corporate performance are positive or negative remains an open question (Flabbi et al, 2019). In addition, research on the executive team and corporate performance is mainly targeted at the main board market in China (Peng, 2007; Liu et al, 2014; Lin F, 2016). However, in 2009, the second board of China established, Growth Enterprises

Markets (GEM)[1], board in China is established. As a great complement to the main board, GEM has played a significant role in China's economic development, optimization of economic structure and allocation of resources. In addition, Chinese GEM board provides those companies with high growth potential access to finance and help high-tech firms to develop business and promote the growth of those enterprises (Huang, 2016). In relation to executive compensation and top management team structure, many prior studies covered the main board and relatively few studies devoted to GEM boards. Therefore, the research on executives' team and firm performance based on the GEM listed companies in China worth investigation. In addition, (Wei et al., 2017). Also, recent years have witnessed a few positive efforts by Chinese authorities towards addressing existing challenges in the form of good corporate governance, policies, regulations, and management (Ntim et al., 2017; Elmegrahi et al., 2019). With the improvement of the female status and their comprehensive quality, an increasing number of female directors emerged, who have become the indispensable and key factor in corporate governance. This, therefore, serves as a motivation for us to examine the effect of governance structures, as measured by corporate board gender diversity (female directors), on performance for GEM listed companies in China. Moreover, during the previous three decades, corporate governance in China has changed considerably and corporate governance has become a main concern in Asia, especially after the 1997 Asian financial crisis (Sial et al., 2019).

Based on the above discussion, the aim of this paper is to investigate the relationship between executive compensation, management gender diversity and firm performance in Chinese GEM listed firms by adopting triangulation in theories. Specifically, agency theory and motivation-hygiene theory are connected to the pay-performance relationship, and the research of gender diversity is based on upper echelons theory and women leadership style.

The paper offers a number of contributions. First, considerable research efforts have been devoted to executives' compensation structure and top management team structure in some countries, such as the

[1] In October of 2009, the second board of China stock market, the Growth Enterprise Market (GEM), was established. It is 'a separate listing venue from the existing Main Board of an exchange, usually for small-sized and medium-sized firms and high-tech firms, which can not be listed on the stock market smaller. It is for faster-growing and more "entrepreneurial" companies that have difficulty meeting the full listing requirements of the Main board' (Cheung, & Liu, 2014). The China GEM Board aims to provide a platform where smaller companies with growth potentials, which cannot fulfil the full listing requirement of the Main board of the China stock market, can obtain financing through public offerings. It is an effective complement to the main board market.

United States, Denmark and South African firms (Balafas & Florackis, 2014; Bussin and Modau, 2015; Morck et al, 2006). However, as for China, most previous studies about executives are focused on the main boards in China (Kevin, Paul, McGuinness, 2013; Wu et al, 2010; Liu et al, 2014), and little research has been conducted in the GEM board in China. The GEM boards in China are considered as a developing market, and the research is still unexplored. As a result, research on GEM listed companies is conducive to provide reference for the establishment of performance-based compensation system and the adjustment of management structure for GEM listed companies in China. Secondly, the proportion of female executives in most countries in the world shows an increasing trend, but the proportion of female executives in Mainland China is still lower than that in western developed countries (Gao et al, 2016). The research on the impact of the participation of female executives on corporate performance is helpful to provide the basis of gender factors for optimizing the structure of senior executives and developing more efficient corporate governance models (Ahmadi, Nakaa and Bouri, 2018; Catalyst, 2014). Moreover, due to the imperfection of China's traditional culture and legal system, the social division of labour between men and women is not equal. It is worth mentioning that, although the proportion of female directors increased from 1999 to 2011, the gap with that of male directors is still large (Liu et al, 2014). Thus, the study on female executives is conducive to the evaluation of women's role in social production and enterprise development and is of great significance to the maintenance of social equity. Therefore, exploring the relationship between the gender structure of the executive team and corporate performance justifies this research.  Thirdly, our results have some implications to both academics and practioners. Ain et al., 2020-Finally, this study adds to the current global debate on the mandated or voluntary participation of women directors on the board. Because of this growing attention, improved understanding of female directors' role in the improvement of corporate governance will assist academics, policymakers, and regulators in decision-making regarding the value of female directors.

The remainder of the paper is organized as follows. Section 2 outlines the different theoretical background used in this paper. Section 3 illustrates literature review and development of hypotheses. Section 4 sets out the paper's research design and outlines the variables used in the current study. Section 5 presents and discusses the results. Section 6 sets out our conclusions and discusses the implications and limitations of the research.

## 2. Theoretical Framework

This section introduces the theoretical basis of executive compensation and gender diversity, including agency theory, upper echelons theory, motivation-hygiene theory, and women leadership style.

### 2.1 New perspectives of agency theory

Agency theory has formed the theoretical basis for corporate governance in several scholars' research. Agency theory was proposed by Jensen and Meckling (1976), who state that agency relationship is one or more owners (principals) appoint and employ other persons (agents) to serve them according to the contract, and grant agents some certain decision-making power, leading to the separation of ownership and control. In modern enterprises, ownership tends to be diversified and companies are controlled by a number of professional executives (Ntim et al., 2015) and as a result, agency problems are driven from it.

Previous literature on executive compensation has mainly used two perspectives of agency theory, including optimal contracting approach and managerial power approach (Bebchuk and Fried, 2003; Murphy, 1985). *Optimal contracting approach* views that equity compensation is an effective means to solve the principal-agent problem, and equity incentive plan can effectively alignment of shareholders' interests with those of the executive management (He, Wan & Zhou, 2014). Specifically, by linking the agents' compensation with the company's performance to the maximum extent, the agent can always manage and make decisions from the perspective of maximizing the company's value, leading to align management interests with those of the shareholders (Pepper, 2015). As a result, optimal contracting approach views a tight association between compensation and performance (Dong et al, 2010; Upneja & Ozdemir, 2014). However, recent scholars have criticized the compensation level and its sensitivity to corporate performance (Bussin and Modau, 2015; Dan, 2013), and they believe that the conflicts of interests and agency problems in the process of executive compensation should also be considered (Zhang, Tang & Lin, 2016). *Managerial power approach*, on the other hand, assumes that with the expansion of management power to a certain extent, it proposes that senior managers are able to determine their own compensation. Opportunistic executives of firms with poor corporate governance structures can grab corporate resources by deciding their own pay (Choe et al., 2014). In other words, boards may be influenced by executive position power, when making compensation plans. Bebchuk and Fried (2004) state that under managerial power approach, the compensation structure is distorted and the sensitivity between executives' compensation and enterprise performance is reduced. In general, optimal contracting approach is more applicable to companies with effective governance structures. In contrast, managerial power approach applies to companies with poor governance mechanisms apply.

In this paper, the top management team, as an important manager of an enterprise, has entrusted agency relationship with its owner. Therefore, it is necessary to take the important viewpoints of agency theory into consideration, when studying the influence of the senior management team on the company's performance. As a result, **agency theory** is one of the principal theoretical bases for this paper.

It is worth noting also that this study aims to determine the association between having females on the board of directors and agency costs. We believe that agency problems may affect the performance and valuation of the firm, so examining whether gender diversity alleviates agency costs is essential. Limited literature has investigated the association between board composition and agency costs (Ain et al., 2020), providing evidence that gender diversity reduces agency costs. However, these limited studies have overlooked the relationship between gender diversity and agency costs and have mostly focused on highly developed capital markets (e.g. the US and the UK). Therefore, further research is required regarding how female representation on the board of directors' influences agency costs in emerging economies like China.

From agency theoretical perspective, board gender diversity/female directors can play an important role in improving board effectiveness, including increasing managers' commitments towards environment and society in general, increasing managerial monitoring, and bringing a diverse range of ideas, views, perspectives, and skills to a corporate board (Elmegrahi et al., 2019).

### 2.2 Upper echelons theory

Due to the limitations of individual decision-making of a CEO, Hambrik (1984) proposed upper echelons theory, and after that, academics have gradually shifted research direction to the overall decision-making behaviour of senior management. Under upper echelons theory, Hambrick (1984) states that the relevant population characteristics of the senior management team, including age, gender, educational background, professional background would greatly influence the managers' behaviour. This is because the manager is the decision maker of an enterprise, thus the difference of population characteristics also affects the strategic selection of the enterprise and enterprise performance. Upper echelons theory realizes the integration of both psychology & management together and improves the original research perspective of management theory. Specifically, we depart from much of the existing literature that examines the mere presence of female directors on corporate performance by investigating the effect that unique female director characteristics, such as the proportion, age, and the level of education of female directors. Also, the prior non-Chinese studies suggest that these characteristics can have important impact on firm strategic decisions (Elmegrahi et al., 2019).

In general, upper echelon theory holds an opinion that due to the complexity of the market environment and the internal structure of a company, managers are likely to choose development strategies according to their own characteristics, thus shaping enterprise performance (Wang et al, 2016). Diversity can improve team effectiveness by broadening the range of experience and expertise of the senior management team or board of directors (Avolio and Bass, 2004). In addition, it can explore the influence of the senior management team to the enterprise management, including the strategic choice, operating cash flow, the enterprise debt levels and the governance structure, and ultimately affect enterprise performance (Wang et al, 2016). Therefore, upper echelons theory is one of the essential theoretical bases of this paper.

**2.3 Motivation-hygiene theory**

Another theory that used in solving the agency conflict between principal and agents in the business process is motivation-hygiene theory. It is also known as two-factor theory, which is proposed by Herzberg (1968). Under motivation-hygiene theory, there are two main factors that can affect employees' work motivation, motivators and hygiene factor. Paying reasonable wages, ensure employee safety and create a positive corporate culture is hygiene factors to reduce dissatisfaction in the workplace (Herzberg, 1968). Motivators refer to the factors that make employees feel satisfied, such as the sense of accomplishment and belonging they get from their work, the challenges they face and opportunities for promotion (Lussier & Achua, 2010). Motivation factors can satisfy the high-level needs of employees. Therefore, the improvement of motivation factors can stimulate the internal potential and work passion of employees and improve the firm performance.

Motivation-hygiene theory is based on the premise that: the choices and decisions executives make are largely influenced by their personal experience, sense of values, and personalities (Hambrick, 2007). Therefore, the composition of top management team directly affects the potential firm performance. According to this premise, gender, as part of the characteristic and personality of the top management team, will affect the corporate performance. Hence gender is a key characteristic when studying executive pay (Nishii et al, 2007). Under motivation-hygiene theory, fixed compensation in executive compensations can merely satisfy hygiene factors of the executive, although it is indispensable. Monetary compensation has an obvious incentive effect on employees. Usually, enterprises will adopt a cash incentive to directly reward employees, which can not only cater for one's material needs, but also have direct positive psychological effect (Herzberg, 1968). However, it only produces short-term results. In other words, after the implementation of a cash incentive for a period of time, the effect would be weakened gradually (Bassett & Lloyd, 2005). Therefore, the incentive effect of monetary compensation lasts for a short time, so it cannot achieve the purpose of long-term incentive. Consequently, excessively high fixed compensation would only increase the agency cost without bringing more motivate effective. Compared with hygiene factors, equity-based compensation in executive compensations is the fundamental motivation factor (Lussier & Achua, 2010). Therefore, senior executives might be motivated by increasing the proportion of equity compensation. Research on compensation has found a large benefit offered by equity-based compensation, including reducing financial constraints (Kim and Ouimet 2014), enhanced employee retention (Oyer 2004), and strengthening the competitiveness (Bova and Yang 2017).

In general, under the modern enterprise system, enterprises cannot merely improve the remuneration and income of senior executives, improve the working environment and other traditions as a way to motivate top management team. By contrast, giving executives more opportunities to contribute to the organization, allowing them to achieve their personal values and development aspirations, and eventually achieve the effect of continuous incentives (Lussier & Achua, 2010). Therefore, it is important to establish a reasonable executive incentive mechanism for modern enterprises as this may motivate them to enhance the company's performance.

### 2.4 Women Leadership style

Corporate governance and top management structure play a crucial role on the enterprise performance. Currently, leaders are stereotyped as predominantly male. However, the influence of female executives as an important part of top management team (Koenig, Eagly, Mitchell & Ristikari, 2011). Considering the different personality characteristics and leadership styles of females from males, it is of profound significance to discuss the relationship between the participation of females and corporate performance.

The rise of research on gender and leadership style has brought several benefits to women's career, leading to increased attention on gender of leaders or managers to pay attention to the influence of gender on leaders or managers. Women leadership style proposed systematically by Helgesen (1990). It is generally accepted that female leaders are typically characterized by honest behaviour (Eagly, 2005) and transformational leadership (Burke & Collins, 2001). Furthermore, some research has shown significant differences in the educational level and professional experience of female executives compared with the male. Basically, women executives can provide a different perspective on board decisions due to different work experience (Smith, 2006). Consistent with this argument, Vinkenburg (2011) noted that female leaders tend to adopt a transformational leadership style. They are likely to encourage others to participate as well as try to increase employees' sense of self-worth by allowing them to take some initiative to make decisions. Similarly, Avolio and Bass (2004) believed that transformational leaders provide employees with motivation and intellectual simulations. Therefore, female leaders are likely to promote team performance and recognition of team goals by aligning team members' goals and fostering collective optimism (Bass and Riggio, 2006). Consistently, Eagly (2016) confirmed that female executives present the characteristics of "individualized consideration" and "contingent reward". As a result, female executives are more considerate and careful to their subordinates, contributing to cultivate enthusiasm and optimism of subordinates.

In general, due to the physical characteristics of female, female managers adopt a transformational leadership style. Furthermore, females are more observant, and they have the ability to identify capable people and unite with them (Vinkenburg, 2011). For instance, female managers are likely to encourage participation by sharing power and information (Rosner, 1990), and thus, teamwork tends to create greater performance under transformational leadership (Bass and Riggio, 2006). As a result, more and more women are become managers and make good performance in management.

Based on the above discussion, this paper will adopt all the above theories (triangulations in theories) to be able to achieve the research aim.

## 3. Literature review and Development of Hypotheses

### 3.1 Cash compensation of senior executives and corporate performance

The triangulation approach of adopting many theories will be utilized as mentioned earlier. In terms of the pay-performance relationship, agency theory and motivation-hygiene theory are adopted. Under the principal-agent theory, owners should align the interests of the managers with the shareholders to achieve the goal of maximizing profits and promote the enterprise's positive development (He, Wan & Zhou, 2014). To effectively resolve the conflict of interest between owners and management caused by information asymmetry or adverse selection, owners and managers would make a relationship between executives' compensation and corporate performance in the form of contract (Bebchuk and Fried, 2003).

Ain et al., 2020-Adams and Ferreira (2009) and Gul et al. (2011) reported that women directors perform better monitoring roles and require extra audit efforts than their male counterparts. However, gender-diverse boards may sometimes be over-monitored, which can become a reason for low gender diversity and erratic firm performance (Adams and Ferreira, 2009). Meanwhile, corporate governance, gender diversity and other institutional factors are not very advanced in China, so over-monitoring should not be a problem here as opposed to developed countries like the United States. In summary, according to agency theory, a gender-diversified board is more beneficial for Chinese firms.

This means that gender diversity may be used as a tool to control agency problems because of female directors' monitoring role, timely decision-making, better strategic control, earnings quality, and their independence on the board. In the context of the agency framework, Adams and Ferreira (2009) stated that gender diversity on boards provides better monitoring because (1) females ask more questions and are less likely to disrupt shareholders' interests, thus reducing agency conflicts. (2) the increased number of viewpoints relating to the active evaluation of decisions (Chen et al., 2016). Thus, if diversity in boardroom results in operative monitoring and reduces conflicts between shareholder and mangers, then it is more likely to reduce agency costs. On the other hand, Carter et al. (2010), using the data of fortune 100 firms, studied the relationship between firm value and board gender diversity in the agency theory context. They reported that female board membership and agency costs had a significant negative association. Their results suggested that gender diversification can expand the controlling and monitoring of managers (Mohan and Ainina, 2012; Siddiqui, 2015). Also, Jurkus et al. (2011) found an opposite relationship between top management women officers and agency costs. This diversity may perhaps increase the monitoring of the board, thus reducing misalignment.

For owners, compensation constraints can reduce agency costs and risks. In addition, it can prevent the executive managers from making decisions that harm the interests of shareholders and affect the development of the company (Meulbroek, 2001), which can effectively supervise and motivate the management. For the managers, their efforts also directly affect the enterprise performance, and thus, affecting their salary.

According to the Motivation-hygiene theory, cash salary is one of the hygiene factors that contributes to employees' safety and create a positive corporate culture to reduce dissatisfaction in the workplace (Herzberg, 1968) , and thus unsatisfied cash payment (i.e., bonus, salary, and other cash payments) will bring serious dissatisfaction to the executives of GEM listed companies. However, executive compensation does not necessarily have the characteristic of motivation factors. In other words, when monetary compensation reaches a critical value, the high fixed compensation would only increase the agency cost, but not bring more incentive effect (Herzberg, 1968). Therefore, although executives have preferences for monetary pays, it is still a short-term incentive. The empirical evidence is largely consistent with the view that there is an association between the cash payment and firm performance, including positive relationship and no relationship. Ataay's (2018) verifies that corporate profitability has a positive impact on executive pay with the improvement of performance and the expansion of the firm size, executive compensation increases. Literature finds a statistically significant positive relationship between corporate performance and executive compensation (Schultz et al, 2013; Ntim, 2015; Yamina, A. et al, 2017).  According to VanPuyvelde (2018)'s research, discussing and evaluating executive performance has a positive impact on firm governance. Similarly, Buachoom (2017) also concluded that there is a simultaneous relationship between performance and executive compensation. In other words, the compensation of senior executives can affect both current and subsequent corporate performance of the listed companies.

In terms of China, Chinese scholars are unlikely to get hold of data related to the monetary compensation. Therefore, they use the top three executives' monetary compensation. This is because the development of China's capital market in relation to growth enterprise market is not mature. In addition, there is a significant pay-performance relationship among larger firms, while there seems to be no pay-performance relationship among smaller firms. On this basis, Wu (2010) added the indicator of executive excess compensation into model, which refers to the difference between the expected salary and the actual salary of executives. The results showed that the monetary compensation of the executive had a positive impact on the total return on assets of the enterprise.

On the contrary, literature argues that monetary compensation of executives cannot have an impact on corporate performance, or only have a weak impact. In other words, corporate performance did not improve with the increase in executives' monetary compensation. Moreover, monetary compensation cannot provide sufficient motivation for senior executives to work hard to improve firm performance. Based on the evidence from South African firms, Bussin and Modau (2015) found that the pay-performance relationship has been declining, particularly since the 2008 global financial crisis. Dan (2013) concluded that CEO compensation would increase as CEO power raise, but interestingly, their pay becomes less sensitive to performance.

Therefore, this paper cannot determine the positive or negative impact on the relationship between cash compensation and firm performance but can only determine that an impact is existing. As a result, hypothesis one is:

*HI: The cash compensation of executives in China GEM listed companies has an impact on corporate performance.*

### 3.2 Non-cash compensation of senior executives and corporate performance

In addition to cash compensation, non-financial compensation (i.e, stock options, performance share plan and other long-term incentive plans) is also an important component of executive compensation (Lussier & Achua, 2010), and stock options is usually taken as an indicator of non-financial compensation when considering the relationship between long-term incentive and firm performance. Based on agent theory, agency cost can be reduced by aligning executives' interests with shareholding (He, Wan & Zhou, 2014).

Also, according to Motivation-hygiene theory, the increase of non-financial benefits of senior executives can increase their job satisfaction and achieve an incentive effect. In addition, some studies show that stock options have a great influence on enterprise performance (Aslam et al, 2019; Conyon and He, 2011; Lin F, 2016; Ntim et al, 2019). The empirical evidence relating to the effect of non-cash compensation on firm performance is generally limited, and thus it requires further study. Aslam, Haron and Tahir (2019) conducted the generalized method of moment method on the relationship between non-cash based remuneration and firm performance of 50 listed companies in Pakistan and find that corporate performance has a positive but insignificant relationship with non-cash based remuneration of CEO which is inconsistent with agency theory.

On the contrary, evidence from the research of Aslam et al (2019) shows that non-cash-based compensation provides significant incentives and those firms are likely to have a better subsequent operating performance, when taking Tobin' Q ratio as the measurement of performance. The result is similar to the findings of the prior studies of Conyon Martin (2014) and Ntim et al., (2019). Evidence from China (Conyon and He, 2011) shows that CEO equity incentive is positively related to stock market performance and accounting performance by using the data from Chinese firms listed from 2001 to 2005. In other words, better-performing companies can offer their chief executives a larger equity incentive. They also state that CEO equity incentives are positively related to growth opportunities. Consistently, Lin (2016) finds that in China, executives, especially CEOs, who have equity grant tend to offer highly efficient and contribute to the increase of firm value. Therefore, hypothesis 2 is that:

*H2: The non-cash payments of executives in China GEM listed companies has a positive impact on corporate performance.*

**3.3 Management gender diversity and firm performance**

Triangulation theory, including agency theory, upper echelons theory and women leadership style, is related to management gender diversity. Consistent with upper echelons theory, the value-creating potential of corporate structures with board of gender-diverse is likely to be performing better than firms that of male-controlled structures (Adams and Ferreira, 2009). Since the different leadership style, female executives are likely to adopt transformational leadership style (Eagly, 2016), which can motivate employees. In addition, Jurkus, Park and Woodard (2011) find that gender diversity of senior managers is conducive to reducing agency costs when corporate governance is weak. In addition, female managers can often obtain important business information due to their keen observation (Helgesen, 1990), which lays a good foundation for the long-term development of the enterprise (Bernile et al, 2018). Ntim et al (2017) argued that appointing female VCs contribute to lifting efficiency and independence through bringing new ideas, knowledge, perspectives and experiences.

Empirical evidence shows that female executives have both positive and negative impact on corporate performance, and even there is no significant relationship between them (Carter et al, 2010; Pasaribu, 2017; Liu et al, 2014; Mohamed et al, 2021). Evidence from Polish innovative firms (Liberda, 2018) shows that the gender of the chief executive does not distinguish between a company's financial performance and reported similar growth in employment and returns. Similarly, Pletzer et al., (2015) find that female executives are not associated with corporate financial performance if other factors are not considered. Based on non-financial UK listed firms from 2004 to 2012, Pasaribu (2017) verified that female executives have no significant relationship with firm performance. Similarly, the findings from Mohamed and Collins (2021) indicated that gender diversity of vice-chancellor has no association with governance compliance.

On the contrary, evidence from Sarhan, Ntim and Al-Najjar's research (2018), female participation in the senior management team is beneficial to the financial performance. Moreover, compared with firms with poor governance, the relationship between gender diversity and corporate performance is remarkably stronger in companies with better governance. Similarly, Flabbi, Macis, Moro and Schivardi, (2019) verified that the influence of female leaders on corporate performance rises with the increase of the proportion of female employees and female executives has an impact on the female wage distribution. A Chinese study by Yu Liu (2014) who adopted ROA and ROS to measure corporate performance and explored the relationship between female executives and corporate performance by empirical analysis and find that female executive directors have a stronger positive effect on corporate performance.

In general, leadership style and agency theory both view that there is a close relationship between corporate governance structure and the number of women in board in directors, which can make a difference in firm performance. Therefore, hypothesis 3 is that:

*H3: Female executives have a positive impact on corporate performance.*

## 4. Data and Methodology

This section describes the sample selection and data collection. In addition, this section also shows research methods implementing for verifying the hypotheses.

### 4.1 Data and sample collection

In order to prevent the possible influence of sample abnormality on the conclusion, samples selected should meet the requirements according to the following criteria. (1) Data collected for the financial year of 2016 and 2018, taking into consideration that the data of the last three years can better reflect the performance changes of the company. (2) Incomplete data are not considered to meet the criteria for inclusion in the sample. (3) Eliminate companies that had shown deficits for three years running. Since this kind of company's asset-liability ratio is often greater than 1, which does not have generality. (4) Companies that use equity incentives. In other words, during the period of 2016 to 2018, senior executives have owned equity in the company. (5) Since merely a small number of companies (16 firms) have disclosed information about female executives in 2019. Therefore, this paper does not use the data from 2019 as a sample.

Data collected from the official website of the Shenzhen Stock Exchange and the China Stock Market and Accounting Research Database (CSMAR). Our results are based on data collected from 1383 sample data (461 firms in 3 years) that meet the above criteria.

### 4.2 Methodology

This section discusses the model adopted in this empirical analysis, and describes the variables used in the model.

4.2.1 Research design

Following the theoretical analysis and the stream of prior studies (He, Wan & Zhou, 2014; Lin F, 2016; Ntim et al, 2019; Yu Liu, 2014), the following models are constructed to explore the relationships between the gender diversity, executive compensation and corporate performance in China's GEM listed companies.

To test Hypothesis one (the relationship between the cash compensation and corporate performance of GEM listed companies in China), model (1) is established as follows:

*Model (1): Tobin Qi,t*= $\alpha 0+\beta 1CP+\beta 2firmsize+\beta 3LEV+\beta 4industry+\varepsilon$;

To test Hypothesis two (the relationship between the non-cash payment and corporate performance of GEM listed companies in China), model 2 is established as follows:

*Model (2): Tobin Qi,t* = $\alpha 0+\beta 1NCP+\beta 2firmsize+\beta 3LEV+\beta 4industry+\varepsilon$;

To test Hypothesis 3 (the relationship between the management gender diversity and corporate performance of GEM listed companies in China), model 3 is established as follows:

*Model (3): Tobin Qi,t*= $\alpha 0+\beta 1Dwomen+\beta 2Pwomen+\beta 3firmsize+\beta 4LEV+\beta 4boardsize+\beta 5industry+\varepsilon$;

Where, α=Intercept,ε=error item.

Table (1) shows summary definitions of the variables employed in this research.

*Insert table (1) around here*

3.2.2 Measurement of variables

3.2.2.1 Dependent variables

Firm performance as dependent variables are multi-dimensional concept, which cannot be expressed by a single indicator. Several scholars used return on assets (ROA), return on equity (ROE) or return on investment (ROI) to measure firm performance (Erhardt, 2003; Díaz-Fernández, 2015; Lam et al, 2013; Koenig et al, 2011). However, the purpose of equity incentive is to motivate executives to make contributions to the long-term development of the company. Therefore, Tobin’s Q ratio is selected as dependent variable from financial statement perspective. Moreover, reflect firm performance comprehensively and improving the accuracy of the results, ROA, which is market-based indicator, would be used in robustness tests.

Tobin’s Q ratio is a market indicator and long-term, and it is often used to measure the firm performance (Adams & Ferreira, 2009; Raithatha & Komera, 2016; Yamina & Mohamed, 2017). It measures company performance from the perspective of investor expectations (Raithatha et al, 2016). In other words, since the investment decision of investors depends on the expected level of their investment, and thus when the expected level of the firm performance is high, the stock of the company will be favoured by investors. When Tobin's Q is greater than 1, it indicates that enterprises have intangible assets related to future growth opportunities (Sudarsanam, 2003). Due to the feasibility of data acquisition and the previous research of scholars, this paper will adopt Tobin’s Q ratio as the one of indicators to measure the firm performance of GEM listed companies. It can be calculated as follows:

Tobin's Q ratio = the market value of the enterprise/the total assets at the end of the period.

#### 3.2.2.2 Independent variables

The independent variables in this paper are Pwomen, Dwomen, cash payments of executives and non-cash payments of executives. The independent variables consist of four different variables to measure the gender diversity and executive compensation. First, there are two ways to measure gender diversity on boards: (1) the proportion of women on boards; (2) Dummy variable: if there is at least one woman in the board of directors, it is 1; otherwise, it is 0.

Second, executive compensation perspective is also measured by two other variables: (1) the cash payments of executives, including salary, bonus, and other cash payments; (2) the equity-based compensation of executives, which is reflected by the market value of the shares held by senior executives at the end of the period in this paper.

#### 3.2.2.3 Control variables

In addition to independent variables and dependent variables, this paper will use firm size, Leverage and industry as control variables.

**Firm size**: The close relationship between firm size and firm performance has been confirmed by many studies. For example, Hermalin and Weisbach (2003) found a significant negative correlation between board size and corporate performance. Therefore, to exclude the influence of firm size, it is necessary to take it as the control variable. In addition, firm size is closely related to economies of scale. There is general agreement that large companies have more opportunities to take full advantage of economies of scale, which would have an impact on corporate performance. In this paper, firm size is measured by the natural logarithm of the total assets of the firm. This measurement is widely used in previous research (Díaz-Fernández et al, 2015; Ntim, 2015; Yamina et al, 2017; Flabbi et al, 2019).

**Leverage**: corporate debt levels does not mean the higher the better. For those enterprises with unstable future cash flow and highly sensitive to economic shocks, excessive use of debt is likely to lead them into financial distress, financial crisis or even bankruptcy. Prior studies, such as Schultz et al (2013) and Yamina, et al., (2017), adopted leverage as standard control variable.

**Industry**：Since the performance of listed companies is affected by many factors, including industry characteristics, enterprise size and other factors. Therefore, industry should be considered (Lam & McGuinnes, 2013; Schultz et al, 2013; Díaz-Fernández et al, 2015) In China, GEM listed enterprises are mainly high-tech enterprises. Thus, this paper selects industry as the control variable. Industry classification standards are directly referred from "industrial classification for national economic activities".

## 5. Empirical results and Analysis

### 5.1 Descriptive statistics

This section demonstrates the descriptive statistical results of the main variables in this paper and displays the observation value, mean, standard deviation, minimum and maximum value of those variables. There are huge differences in the cash and non-cash payments of executives, management gender diversity and firm performance of 461 Chinese GEM listed firms during the period of 2016 and 2018.

*Insert table (2) around here*

Firstly, Tobin's Q ratio is the one and only dependent variable. Results indicate (see table 2) that the mean value of Tobin's Q ratios declined every year. Furthermore, a big gap existed in different firms of their Tobin's Q ratio, since the maximum value of the maximum value of and the minimum value of Tobin's Q ratio is respectively 0.908508 and 10.45083. It may closely relate to the industry type of enterprises and other factors. However, the change in standard deviation is relatively small, decreasing from 1.332191 to 0.85622. In general, the GEM listed firm in China had a significant downward trend over the period of 2016 to 2018.

Table 2 shows the independent variables, the mean value of monetary salary rose from 450,848.6 in 2016 to 550,990.8 in 2018. Therefore, growth in executive team cash payments reflects economic development to a certain extent. However, the growth of the maximum value exceeded that of the minimum value. Therefore, the standard deviation got bigger. It indicates that the gap in executives' compensation was widened, which may be caused by the differences in firm size and industry.

As for the non-cash payments, the mean value of non-cash payments declined from 267,000,000 to 129,000,000. It suggests that executives are reducing their stakes, partly reflecting the downward pressure on the economy and the market downturn. The table suggests wide variation in the distribution of non-cash payments. Specifically, it has a minimum value of 447.5 and a maximum value of 3,780,000. In addition, from table (2), there is a huge gap between the average equity compensation of executives in different GEM listed companies every year. There are two main reasons for this. Firstly, the stock market price of different companies listed on gem varies from year to year. Secondly, the number of shares held by executives of different companies at the end of each year varies also greatly. However, the standard deviation shows a decreasing trend. Therefore, it is hard to judge whether the average equity compensation of executives in GEM listed companies is increasing or decreasing in general.

Table (2) also indicates that the majority of Chinese GEM listed firms have female executives in top management team, and the number of companies with female executives was growing. Furthermore, although the average proportion of women in senior management team has increased year by year, the mean value is changed slightly at around 0.22. It presents that female account for only a small proportion in the composition of senior management team, despite the fact that there are female executives.

From the perspective of control variables, there are three variables, including LEV, firm size and industry. LEV reflects the solvency of the company. From 2016 to 2018, the asset-liability ratio of GEM listed companies fluctuated between 29% to 36% which were relatively low, since the average total debt ratio of listed firms in China is approximately 45% (Wang et al, 2019). Therefore, those firms do not effectively enjoy the benefit that debt brought to firms. However, on the other hand, the proportion of liabilities in the capital composition of enterprises is relatively small can expand the financing potential of enterprises, and then provide a great space for development.

In addition, the mean value of firm size was around 21, and the change was slight, which indicates that the overall size of GEM listed companies is relatively uniform. In addition, the average size of enterprises increases year by year, reflecting the rapid growth of gem listed companies.

*Insert table (3) around here*

In addition, this paper also analyzes the distribution of female executives in various industries. According to the research of Dezso and Ross (2008), the proportion of female executives in traditional industries, such as agriculture, oil and gas, is the lowest, while the proportion is higher in consumption-oriented industries and emerging economies (such as pharmaceutical industry and communication industry). Table (3) show that, in the sample data, financial industry, leasing and commercial service industries, health and social industries and culture, sports and entertainment industries work account for an absolute majority of the total samples, accounting for 33.33%, 32.78%, 37.99% and 38.69% respectively. Followed by agriculture, forestry, animal husbandry and fishery industries and water, environmental and public facility management industries. In addition, the proportion of female executives in electricity, heat production, gas and water production and supply industries and mining industry industries is considerably lower than the mean value, suggesting that women in these industries are relatively resistant to promotion. Overall, the result supports the conclusion that women are disproportionately represented in service and emerging industries. Furthermore, from descriptive statistics, it can be concluded that women only make up only a minority of senior management team. The insufficient number of female executives prevents female from exploiting their strengths in ways of leadership and exert their supervisory role in top management team

### 5.2 Correlation analysis

Before the regression analysis, it is necessary to carry on the correlation test between variables. Since the multicollinearity between variables usually affects the reliability of the regression results. The correlation analysis result is shown in Table (4)

*Insert table (4) around here*

It is generally accepted that the closer the correlation coefficient is to 1, the stronger the positive correlation between variables is. On the contrary, the closer to -1, the stronger the negative correlation between variables. Firstly, cash payment of executives (CP) is negatively correlated with Tobin Q's ratio, with a correlation coefficient is -0.024, however, the correlation is not obvious. It suggests that there is no correlation between the GEM listed companies' performance and the cash payments of executives, which is inconsistent with the hypothesis one. In contrast, non-cash payment of executives (NCP) is positively correlated with Tobin Q's ratio. Specifically, the correlation coefficient is 0.182, and it reaches the 1% significant level. It shows that with the increase of non-cash compensation of executives, the firm value would increase. In addition, dummy variable (Dwomen) and proportional variable (Pwomen) of female executives are negatively correlated with firm performance, although the correlation is not significant. The correlation coefficient between the participation of female senior executives and the industry is 0.058, indicating that there is a significant correlation between the participation of female senior executives and the industry. In other words, the participation of female senior executives varies among different industries.

Although correlation analysis provides a supportive basis for whether there is a significant relationship between various variables and reveals the internal relationship between various variables, regression analysis of the empirical model is still necessary.

### 5.3 Multiple Liner Regression Results

This analysis will verify the 3 hypotheses proposed in this paper by analyzing the regression results of the 3 models.

5.3.1 The influence of payments on firm value

In order to verify hypothesis one and two and explore the relationship between cash payment and non-cash payments of executives and firm performance, this paper first has carried out the fixed-effects model and GLS random-effects model, and also conducted Housman test.

*Insert table (5) around here*

The outcome of Housman test is the Prob is 0.00. Therefore, the fixed-effects model is selected to test this hypothesis. Considering the industry code as the cluster variable, the cluster robustness test is carried on, and the results of the fixed-effect model is obtained. Results in table 5, demonstrates the p value of the cash payment is 0.530, which do not pass the significance tests. It indicates that cash payment does not present statistically significant correlation with Tobin's Q ratio. Furthermore, for non-cash payment, the p value is 0.000, reaching at the 1% significant level. Considering the coefficient is 0.00000000185, the conclusion can be drawn is that non-cash payments of executives in Chinese GEM listed firms has a positive impact on Tobin Q's ratio as well as the firm performance, but the impact is not significant.

For control variables, the p value of asset-liability ratio (LEV) is 0.000, which is significant at 1% level. Also, its coefficient is -1.688921, indicating that LEV presents a significant negative correlation with the current firm performance. In addition, for firm size, the p value is 0.000, suggesting that it also reaches the 1% significant level. Also, its coefficient is 1.30643, indicating that the firm size has a significant positive impact on firm performance. Similarly, as for the industry, the p value is 0.006 and the coefficient is -0.0412779. Therefore, there is a significant and negative correlation between industry and Tobin's Q ratio.

5.3.2 The influence of management gender diversity on firm value

In addition, taking into account of the coefficient of Dwomen (-0.1438061), it can be concluded that the presence of female executives in top management team would have a positive impact on corporate performance. However, the p value of Dwomen (whether there is female in top management team) is 0.372, which is greater than 0.1. Therefore, this correlation is not significant. This result is consistent with Pasaribu's research (2017), that is, the existence of only female executives does not have an impact on corporate performance. In other words, the existence of female executives is irrelevant to the corporate performance. In addition, for P women (the proportion of females' executives in top management team), the coefficient is negative (-0.8938446), and it reaches the 10% significant level. Therefore, it illustrates the proportion of female executive shows negative associations with Tobin's Q ratio within this model. Therefore, it suggests that the increasing number of female executives in top management team have an impact on corporate performance, and this negative effect becomes more significant.

Furthermore, for control variable, asset-liability ratio (LEV) is negatively and significantly correlated with corporate performance, which agree with the trade-off theory. Specifically, when an enterprise overuses debt, the cost of financial distress brought by debt gradually increases or even exceeds the profits it brings (Wang et al, 2019), which would damage the overall value of the enterprise. In addition, there is a positive correlation between firm size and enterprise performance, indicating that the firm performance would get better with the expansion of enterprise scale, which probably due to the increase of resources owned by the enterprise (Choe et al., 2014).

### 5.4 Robustness Tests

In order to further examine the rigorous of the above results, this paper conducts robustness tests. Since there are multiple measurement methods for corporate performance, however only Tobin's Q ratio is used in this paper, which may affect the reliability of empirical results. Therefore, in this section, ROA is used instead of Tobin Q's ratio to measure firm performance. Then, regression analyses are carried out and the results are shown in the table (5).

For the model (1) and model (2), cash payment does not show an association with ROA, while non-cash payments show a significant positive correlation with ROA. This means that non-cash payments of executives in Chinese GEM listed firms have significant positive impact on firm performance. Therefore, the regression results of model (1) and model (2) are verified. On the role of management gender diversity in company performance, the p value of the dummy variable is 0.700, and thus it does not reach the significant level. Also, the p value of pwomen is 0.015, which is at the 10% significant level. Due to the coefficient is negative, and thus it suggests the proportion of female executives is negatively and significantly associated with ROA. Overall, from the robustness test results, the results are mainly consistent with the main regression results.

**5.5 Discussion**

Based on the multiple liner regression analysis and robustness analysis, all hypotheses have been explored and tested. In general, executives' non-cash compensation plays a significant role in the improvement of Chinese GEM listed firm performance, while the impact of female executives on firm performance is negative.

*Cash payments and firm performance*. Hypothesis one has assumed that cash payments of executives in China GEM listed companies has an impact on corporate performance. The regression results of model (1) shows that the relationship between cash compensation and firm performance is not significant. It is inconsistent with hypothesis one. Specifically, all the p values of cash payments are greater than 10%. it means that there is no significant association between cash compensation of executives in Chinese GEM listed firms and firm performance. Therefore, hypothesis one is not supported. This result is against the viewpoints of Ataay (2018), Buachoom (2017) and He et al., (2014) and agency theory. Agency theory stated that since senior executives have a principal-agent relationship with the firms, thus, if executives' compensation is linked to the company's performance, they can always aim at maximizing the value of the company and ultimately maximize the interests of shareholders (He, Wan & Zhou, 2014). But consistent with Bussin and Modau's (2015) and an's (2013) findings, that is executives' pay becomes less sensitive to performance.

Although the result is against most scholars' viewpoints, it is still credible after considering the current situation of GEM market in China. This is because executive cash compensation in GEM companies in China has no obvious impact on corporate performance, which may be justified the following reasons. Firstly, the GEM market is not established for a long time. Although the GEM listed companies have established the salary incentives mechanism, the governance structure, salary scheme and ineffective management and performance appraisal system of enterprises is still not perfect (Cheung and Liu, 2014). Therefore, executive performance pay is not highly linked to corporate performance, and corporate performance is not sensitive to executive compensation, leading to the low incentive effect. Secondly, from the perspective of motivation-hygiene theory, cash compensation, as a hygiene factor, can merely satisfy hygiene factors of the executive (Herzberg, 1968), although it is indispensable. Fixed cash compensation only produces short-term results on motivating employees (Bassett & Lloyd, 2005). In other words, after the implementation of cash incentive for a period of time, the effect would be weakened gradually. In addition, as can be observed from descriptive statistics that monetary compensation of senior executives has grown rapidly in recent years. As a result, the incentive effect of monetary compensation on executives of GEM listed companies is not remarkably. Therefore, it consistent with motivation-hygiene theory, which holds the views that cash compensation, as a hygiene factor, has limited incentive effect on employee. On the other hand, the non-significant impact of monetary compensation on firm performance also confirms the theoretical point of view of this theory.

In terms of control variables, the result is consistent with the majority of prior studies. To be specific, firm size is positively associated with firm performance (Murphy, 1985), and leverage is negatively associated with firm performance (Conyona and He, 2011).

*Non-cash payments and firm performance*. Hypothesis two demonstrated that the non-cash payment has a positive impact on firm performance. The results from regression analysis and robustness analysis show that the non-cash compensation positively affects the firm performance. In addition, prior empirical research finds that compared with monetary compensation, executive equity compensation has a significant positive effect on corporate performance (Aslam et al, 2019; Lin F, 2016; Ntim et al, 2019). Although the equity incentive mechanism of GEM listed companies is not perfect at present, and the phenomenon of zero or low shareholding ratio of executives still exists (Cheung and Liu, 2014), equity incentive mechanism has a better effect than monetary incentive mechanism in terms of its impact on corporate performance. Therefore, hypothesis two is supported. The result agrees with prior research of (Aslam et al, 2019; Ntim et al, 2019; Lin F, 2016) It is also consistent with the motivation-hygiene theory. Under motivation-hygiene theory, non-cash payments, including stock options, performance share plan and other long-term incentive plans, are motivation factors, which are conductive to motivate people at their work and improve firm performance (Bova and Yang 2017). Compared with fixed cash salary it can satisfy the higher-level demands of employees (Lussier & Achua, 2010). Consequently, the result of the empirical analysis is that non-cash payments of executives in Chinese GEM listed firms is positively associated with firm performance.

*Managements gender diversity and firm performance*. Hypothesis three predicted that female executives have positive impact on corporate performance. However, the results from both from regression analysis and robustness analysis present that the proportion of females' executives in top management team show negative associations with firm performance. Therefore, hypothesis three is not supported. The results are not in line with the prior studies of (Flabb et al, 2019; Sarhan et al, 2018; Yu Liu, 2014). Consequently, after controlling corporate size, industry and asset-liability ratio, female participation in the senior management team has a negative impact on corporate growth in Chinese GEM listed firms. Currently, most listed companies in China are still under the influence of traditional Chinese gender concepts, and thus, gender bias and gender stereotype are still existed (De Jonge, 2015). It is generally accepted in society that women should take on wider family responsibilities, rather than bearing the burden of being breadwinners (Gao, Lin & Ma, 2016). Mohamed et al (2021) explained that firms probably recruit women directors for symbolic reasons, leading to their limited role in strategic decision making. Therefore, the role of women in the organization failed to be valued, making women merely a small amount of the senior management team. It leads to female cannot play a decisive role in decision-making and corporate governance. On the contrary, it would increase the inconsistency of opinions and increases the possibility of conflicts, which is not conducive to firm performance. In addition, as many companies set up female executives to meet the needs of corporate image and external interests (De Jonge, 2015), and thus, female' executives tend to have only symbolic meanings and have little actual power. In other words, the proportion of female executives in senior management is low, which has limited their impact on corporate performance. Consequently, these factors may also lead to the negative impact on female participation in the executive team on enterprise performance.

## 6. Conclusion

This paper aims to cover the research gap in GEM in China by investigating the impact of executive compensation and female executives on firm performance in Chinese GEM listed firms. Tobin's Q ratio is used as the proxy of firm performance. Two factors, including the average cash payments and the average non-cash payments, are selected as the measure of the executive compensation. In addition, female executives are measured by whether there is female in top management team and the proportion of female executives. Also, asset-liability ratio, firm size and industry are adopted as control variables to improve the accuracy of the results.

This paper selects the annual report data of 461 GEM listed companies in China from 2016 to 2018 and analyzes the necessity of top management team based on agency theory, upper echelons theory, motivation-hygiene theory and women's way of leadership theory. On this basis, the empirical analysis explores the influence of executive compensation system and executive team gender structure on corporate performance.

The results showed that fixed cash compensation of executives in GEM listed companies has no significant correlation with corporate performance, while the equity compensation significantly and positively affected corporate performance. Therefore, it can be concluded, that there is a relationship between salary and performance in the current remuneration system of GEM listed companies in China. In contrast, equity incentive as a form of long-term incentive has a good promotion effect on enterprise performance. This is in line with motivation-hygiene theory, but inconsistent with agency theory. Additionally, control variables testify that firm size positively affects firm performance and leverage negatively affects firm performance. As a result, GEM listed companies should change the original remuneration structure, and establish a better developed long-term incentive mechanism, so that short-term incentive and long-term incentive are able to jointly contribute to the promotion of firm performance.

Moreover, after taking the firm size, leverage and industry as the control variables, female participation in the senior management team has a negative impact on GEM listed firms' performance in China. This result is not in line with the previous research of (Burke and Collins, 2001; Helgesen, 1990). In relation to the women leadership style, our justification is that females, compared with males, are risk-averse and their behaviour are more cautious and conservative (Smith, 2006). As result, female executives may discourage corporate investment. However, innovation decision is one of the important strategic decisions for enterprises, which is related to the improvement of core competitiveness of enterprises. Therefore, it may be the cause of the result that the participation of female executives negatively affects firm performance. Furthermore, companies may be under external pressure to hire women, rather than based on their comprehensive abilities (De Jonge, 2015). Therefore, female executives are symbolic existence, leading to the fact that female executives have no real decision-making power, and they are in a weak position in the company's management and females are unable to play their real role. Consequently, the participation of female executives has negative impacts on firm performance in GEM listed firms in China.

In addition, the results show that the average proportion of female executives in China's GEM listed companies is around 21% and presents an increasing trend. This phenomenon is consistent with the conclusions of foreign scholars, indicating that female executives' participation in corporate management activities is common. However, the proportion of female executives in Chinese GEM firms is still at a low level. On the one hand, it is closely related to the traditional male-dominated business environment. On the other hand, compared with other countries, China has not promulgated relevant laws and regulations to create good conditions for women to work in the business field (De Jonge, 2015).

The paper offers number of contributions. First, considerable research efforts have been devoted to executives' compensation structure and top management team structure in some countries, such as the United States, Denmark and South African firms (Balafas & Florackis, 2014; Bussin and Modau, 2015; Morck et al, 2006). However, as for China, most previous studies about executives are focused on the main boards in China (Kevin, Paul, McGuinness, 2013; Wu et al, 2010; Liu et al, 2014), and little research has been conducted in the GEM board in China. Secondly, the proportion of female executives in most countries in the world shows an increasing trend, but the proportion of female executives in Mainland China is still lower than that in western developed countries (Gao et al, 2016). The research on the impact of the participation of female executives on corporate performance is helpful to provide the basis of gender factors for optimizing the structure of senior executives and developing more efficient corporate governance models (Ahmadi, Nakaa and Bouri, 2018; Catalyst, 2014). It is worth mentioning that, although the proportion of female directors increased from 1999 to 2011, the gap with that of male directors is still large (Liu et al, 2014). Thus, the study on female executives is conducive to the evaluation of women's role in social production and enterprise development and is of great significance to the maintenance of social equity. Therefore, exploring the relationship between the gender structure of the executive team and corporate performance justifies this research. Finally, this study adds to the current global debate on the mandated or voluntary participation of women directors on the board. Because of this growing attention, improved understanding of female directors' role in the improvement of corporate governance will assist academics, policymakers and regulators in decision-making regarding the value of female directors.

The main findings of this paper have both theoretical and practical implications. Firstly, from the theoretical significance perspective, there are relatively few researches on executive of GEM listed companies in China, and unified research conclusion is not formed. Therefore, this paper can enrich the literature on the impact of executive compensation and female executives on GEM listed companies' performance and provide a new perspective for the theoretical construction of senior management of GEM listed companies, which has certain theoretical significance. In addition, this study provides empirical support for the value of women's participation in corporate governance and provides guidance for enterprises to select talents and optimize the gender structure of management. Secondly, literature on female senior executives in the relevant research fields in China is limited. Based on the specific economic, social and cultural background of GEM board, this paper discusses the impact of female participation in senior management team on enterprise performance. From the perspective of gender diversity, this study provides new evidence for the adoption of both upper echelons & women leadership theories together. In addition, this paper adopts empirical analysis and takes GEM listed companies to analyze the relationship between female participation in executive team and enterprise performance, which provides new factual basis for the research in this field. Thirdly, for the practical significance, problems do exist with executive compensation structure of GEM listed companies in China, such as high executive compensation. Therefore, how to build a reasonable executive compensation system is critical. As the most direct evaluation index of the contribution of senior executives, corporate performance should be regarded as an important factor reflecting the incentive effect as the main board market does. Therefore, the research on the correlation between executive compensation and corporate performance of GEM listed companies provides a useful reference for promoting the establishment of performance-based compensation system for GEM listed companies in China.

Our results have practical implications for governments, policymakers and regulatory authorities, by indicating the importance of women to corporate success (Agyemang-Mintah, and Schadewitz, 2019). We also believe that as there are no restrictions in China to promoting board gender diversity, this study provides useful insights regarding how female directors in China can use their power and bring about change in firms. Therefore, the Chinese government needs to strengthen legislation promoting board gender diversity and provide conducive working environments in which women can work effectively. This is not important only ethically; low gender diversity means ignoring the talent pool, which would otherwise contribute significantly to corporate value.

Our study also in line with the previous study of (Ain et al., 2020) that, it provides evidence that, within the corporate governance mechanism, female directors are valuable; a fact that, in turn, should be valuable for policymakers by supporting recent global legislative initiatives regarding female directors' participation on boards. In addition, policy makers should encourage females' career development by offering professional training programs to generate a fair, competitive environment for senior female management. Additionally, Chinese policymakers and regulators should introduce new legislations that they can serve as a motivation for Chinese companies to have diverse boards in order to improve their performance (Elmegrahi et al., 2019). This is because the continuous appointment of male candidates at the expense of females creates the impression that knowledge, talent, skills, experience, and the ability to address corporate issues are vested only in the hands of men (Agyemang-Mintah, and Schadewitz, 2019). We believe that women with competent skills, experience and qualifications deserve the opportunity to serve on corporate boards.

Agy---- Summary and conclusions Based on the research motivations and the empirical results ascertained, it has been proven beyond any reasonable doubt that the appointment of women to the corporate board is vital to a firm's success. The appointment of women to any corporate board should be carried out with the motive that their presence will enhance the firm's financial value, and not as a symbolic gesture. The presence of women on any corporate board should focus on what they will be able to bring to the performance of the board.

Although this paper can provide some suggestions on the impact of executive compensation and the participation of female executive on firm performance, there are several limitations. Firstly, due to the short period of the establishment of GEM in China, the market development is still not sound. Accordingly, there is still some untimely and unreliable information in the disclosure of the annual report of listed companies in GEM board (Cheung, W. & Liu, K, 2014), which also directly affects the reliability of sample. In addition, GEM listed companies are in a stage of rapid development. However, the research results of this paper are applicable to the period from the establishment of GEM to the present and may not necessarily represent the research conclusions after the development of GEM has stabilized. According to the above limitation, further study can be carried on in several aspects. Firstly, after the well-developed of GEM listed firms, the research on the GEM listed firms can be subdivided into different industries. Since the listed companies of different industries are affected by various factors when making strategic decisions will be influenced by different factors. Therefore, the results for each industry are of guiding significance. Also, the sample time span can be expanded, to improve the reliability and universal of the conclusion. Secondly, there are other factors that affect enterprise performance. However, due to the limited research ability, the selected dependent variable does not fully cover all factors, and the empirical model only considers the multiple linear regression analysis, which affects the reliability of the research conclusion. To be specific, Tobin's Q ratio is still limited to measure the company’s performance. Because Tobin's Q ratio depends on the changes of the market, and the stock market is known to be unpredictable. The stock market value of a company is affected by political factors, economic environmental factors and other related factors, and thus, the stock price is prone to fluctuations and has great instability. Multiple indicators related to enterprise performance can be selected in further studies. When establishing the model, as many important indicators affecting corporate performance as possible should be included. Thirdly, executive compensation defined in this paper includes monetary compensation and equity compensation. However, in fact, executive compensation structure in listed companies is relatively complex. Monetary compensations are not simply based on salary and bonus, and equity compensation cannot simply be described by the market value of the shares held at the end of the year. However, based on the limitations of data sources and the operability of empirical research, the definition of executive compensation in this paper is relatively simple. Further research could put emphasis on improving the evaluation system of executive compensation, since there are many ways for executives to obtain compensation. Also, the study sample was from a single developing country, which hampers its generalizability because the Chinese market is different from developed countries and also from some developing countries. Therefore, future studies can replicate this research in other countries to determine its generalizability. Similarly, like all archival research of this nature, our proxies for board gender diversity/female directors and performance may or may not reflect practice. Hence, future research may offer new insights by conducting face-to-face interviews and employing case studies with directors and managers to assess the effect of board gender diversity on performance. Also, it might be worth investigating Financial vs. non-financial in GEM Chinese market. In addition, this study only covered the % of women in the board, but more future research is required to include other dimensions of Upper echelons theory such as age, gender, educational background, professional background would greatly influence the managers' behaviour and might has an impact on companies' performance.

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