

# TMT Heterogeneity and Firm Performance: The Moderating Effect of Managerial Discretion

*Pengbin Gao<sup>†</sup>, Yiyuan Zhang, Yan Xiang, Shaocong Bo<sup>†</sup>*

School of Economics and Management, Harbin Institute of Technology at Weihai, Shandong Weihai 264209, China

<sup>†</sup>Email: gaopengbinhit@163.com; 962197872@qq.com

## **Abstract**

Now the top management team and managerial discretion play an important role in driving the firms' development. This paper built a theoretical model to explore the effect of top management team heterogeneity on firm performance, and analyze the moderating role of managerial discretion. Based on the data of 167 listed firms from Shanghai Stock Exchange in 2019, this paper constructs a multiple regression model and tested the hypothesis. The empirical results show that gender heterogeneity, tenure heterogeneity and education level heterogeneity have a negative effect on firms performance. At the same time managerial discretion can partially moderates the relationship between the heterogeneity of top management team and firm performance, in which capital intensity and the firm size play a negative moderating role, and duality play a positive moderating role. According to the research results, this paper also puts forward corresponding suggestions to improve the firm performance.

**Keywords:** *Top Management Team; Team Heterogeneity; Firm Performance; Managerial Discretion*

## 1 INTRODUCTION

With the development of global economic diversification, the survival environment of firms is more difficult. The development advantage needs the strategic decision that accords with the firm's own development situation. In this case, as a strategic decision-maker, the top managers take on the important task of leading the further firm development. In this process, it tests that the senior managers can make decisions quickly and implement them in the complex decision-making environment. The strategic decision-making needs to rely on the collective strength, not a single leader can do, therefore, the concept of "top management team" is proposed.

In the decision-making process of the top management team, due to the different characteristics of the members, in terms of values, professional experience, etc. There are also many differences. In the selection of appropriate decision-making process, these differences will have a corresponding impact on the final decision-making results, and different decision-making results will affect firm performance. Therefore, it is necessary to study the impact of heterogeneity among TMT members on firm performance.

## 2 THEORETICAL ANALYSIS

### **2.1 Heterogeneity of Top Management Team**

Define heterogeneity as the differentiation of team members' background characteristics, experiences, values and cognitive concepts. It can be seen that heterogeneity is the fulcrum of team research, that is, relative to the study of individual behavior, heterogeneity is the most relevant component dimension study of team behavior, which reflects the structural characteristics and strategic decision-making patterns of the team to some extent. The heterogeneity of top management team is mainly manifested by the degree of difference between members of top management team due to the difference of population characteristics, cognitive level and values [1]. Because there is a significant difference between the heterogeneity of top management team, further to define and analyze the conceptual characteristics of top management team by the classification of heterogeneity. Jackson et al. (1995)[2] pointed out that the heterogeneity of top management team is mainly reflected in the differences of team members in terms of

gender, age, educational level, length of tenure, race difference and type of engagement. The age, gender, education level, occupational background and term heterogeneity mentioned in this paper refer to the degree of difference in the age of the members of the top management team, the proportion of men and women, the educational qualifications, the occupation, the time of employment, and so on. From the point of view of the feasibility of the study, this paper considers the degree of correlation with society, focusing on social heterogeneity with greater social relevance and occupational heterogeneity with greater occupational relevance, five characteristic dimensions, such as age, gender, education level, career background and tenure, were used as the main characteristic variables to measure the heterogeneity[3].

## **2.2 Firm Performance**

Firm performance refers to the operating efficiency and operator performance obtained by the firm in a certain period of operation. Operating benefit refers to the benefit obtained by the firm in the process of production and operation, which will be affected by the internal and external environment, mainly through a variety of financial indicators to express. The performance of the operator reflects the business results brought by the decision of the operator. Wang and Mao (2017)[4] used the return on net assets reflecting the comprehensive profitability of the enterprise as a variable to measure the firm performance. Considering the specific situation studied in this paper, this paper will select a single accounting profit index, net asset income (ROE), to reflect the firm development situation.

## **2.3 Management Autonomy**

According to the Hambrick and Finkelstein (1987), the management autonomy is divided into three categories: environment, organization, and individual[5]. The environmental dimension refers to the characteristics of the external industry environment in which the firm is located; the organizational dimension focuses on the firm itself, generally refers to the firm's own attributes, such as the size, the number of years of the firm's founding, and so on; the personal dimension focuses on the characteristics of the manager himself. Zhang and Zhang (2014) pointed out that management autonomy should be classified according to the three dimensions of macro, meso and micro[6], that is, it can be understood as external environment, organization or whole production industry, personal dimension. Lian et al. (2013) believed that management autonomy can be measured in terms of environment, system and organization, respectively[7]. These are proxy variable measurements of management autonomy, in addition to perceptual measurements, involving subjective factors, mostly using questionnaires, aspects of the scale. This paper divides management autonomy into three dimensions: capital intensity, firm size, and duality[8].

# **3 PROPOSED ASSUMPTIONS**

## **3.1 Main Effect**

Managers with decision-making power are often not individual members. Therefore, top management team plays a key role in the process of firm development. On the basis of the study of the high-level ladder theory[9], some scholars began to pay attention to the heterogeneity of top management team to study the impact of the differences in the age, gender, tenure, education level and professional background of the members of the top management team on the firm development. Some scholars believe that the heterogeneity of top management team is beneficial to firm to explore innovation and form a competitive advantage, and the team with higher degree of heterogeneity has more abundant resources, which is beneficial to the promotion of firms innovation performance[9]. Top management team heterogeneity plays a positive role, but also has a negative impact. Team heterogeneity may cause differences within the team, hinder effective communication and communication among team members, and reduce satisfaction and team cohesion among members[10]. On the one hand, different functional backgrounds of executive members will increase the cost of communication and easily cause group differentiation, reduce the efficiency of decision-making and thus miss opportunities; on the other hand, under the influence of "relationship orientation" culture, team members often afraid or unwilling to make different opinions in order to obtain resources, close relationships and avoid isolation, which greatly weakens the advantages of team heterogeneity.

### **1) Age Heterogeneity**

Individuals in the team often seek to be close, and individuals of similar age are more closely connected. The same background of growing up will make people's cognitive experience to a certain extent similar, cooperation and communication with each other smoother. From this, it seems that teams with small age heterogeneity contribute to the smooth progress of the decision-making process. On the contrary, when the age heterogeneity of team members increases, it is possible to cause differences of values and disagreement among team members, causing internal conflicts. This will affect the efficiency of management communication, team decision-making level will decline, and then affect the firm output. At the same time, the role of the environment can not be ignored. When a familiar environment or a major change strategy needs to be developed, members of the top management team with high age heterogeneity will exert their diverse advantages in experience, experience, cognition, behavior, etc., embody the collective ability to solve difficulties and help firms adapt to the dynamic environment and meet challenges. It can be seen that the influence of age heterogeneity may be related to the environment of the firm and the decision-making task faced, which needs specific consideration.

H1: Age heterogeneity of top management team is negatively correlated with firm performance.

### *2) Gender Heterogeneity*

The gender composition of the members of the top management team is often non-single. Generally speaking, the male executive members are relatively large. However, gender differences and actions taken in the decision-making process also vary considerably. In contrast, male executive members tend to invest in higher-yielding investments and are more risky, while female executive members tend to invest in robust investments. As a result, when there are more male executive members in the team, team decision-making is riskier and returns may be higher, while when there are more female members, investment is more secure. Thus, gender differences are closely related to final decision-making and firm performance.

H2: Gender heterogeneity of top management team is negatively correlated with firm performance.

### *3) Tenure Heterogeneity*

Term heterogeneity of top management team refers to the difference in the length of time a team member becomes a top management team member. The longer you get along with the team, the deeper the members understand each other, which will improve communication efficiency. The members who join the team with different time will have different understanding of the firm development process and the problems faced, and can not identify with each other very well, which will reduce the efficiency of team behavior. High team term heterogeneity, on the one hand, will reduce the unity of team members, resulting in the decision-making process is not easy to reach agreement. On the other hand, members with different terms of office have different views on the company, which can help break the rule regulation, if the need for change of the firm, term heterogeneity can play its advantages.

H3: Tenure heterogeneity of top management team is negatively correlated with firm performance.

### *4) Education Level Heterogeneity*

Educational level heterogeneity and age heterogeneity belong to non-work-related heterogeneity index, and its influence on firm performance can also be analyzed from two aspects. On the one hand, the level of education will affect a person's character, habits, mode of thinking, learning ability and so on, and the large gap in education level may lead to conflicts and differences; on the other hand, the differentiation of education level increases the diversity of knowledge and skills of top management team members, and the complementarity between team members in the implementation of strategic decisions helps to produce more perfect solutions to problems.

H4: Education level heterogeneity of top management team is negatively correlated with firm performance.

### *5) Career Background Heterogeneity*

Career background refers to the manager engaged in a longer career attributes, when a person engaged in a career for a long time, he will form its related thinking methods, cognitive patterns. The professional background of the members of the top management team varies greatly, and the team's examination of the problem can be more comprehensive ability to deal with complex things. But different professional background will cause the

effectiveness of communication within the team to be reduced, and it is difficult to reach an agreement on strategic consistency, which will affect the efficiency of management and adversely affect firm performance.

H5: Career background heterogeneity of top management team is negatively correlated with firm performance.

### **3.2 Moderating Effect**

As for the research of management autonomy, management autonomy plays a regulatory role in many aspects. Yang Lin (2018) and others found that different levels of management autonomy have a positive regulatory effect on the relationship between senior executive team experience and cross-border growth of enterprises, but it can not be considered that the heterogeneity of senior executive team must bring better performance for enterprises[8]. Zhao et al. (2010) found that when the market competition is fierce, executive perceived management autonomy is positively related to enterprise performance; In the case of weak market competition, the negative correlation between the two[11][11], Gao Ya et al. (2012) studied management autonomy, executive compensation and enterprises relationship between performance and find that management autonomy has an important impact on enterprise performance[12].

Hambrick and Finkelstein (1987) divide management autonomy into three categories: environment, organization, and individual[13]. At the environmental level, the industry environment will affect managers' external management power[14], and the main factors affecting management autonomy include the potential growth ability of the industry environment and the capital intensity, etc. At the organizational level, there are also relatively many factors that affect the autonomy of management, such as the nature of the firm, whether state-owned or non-state-owned enterprises, equity concentration or relatively scattered, firm scale, whether large firm or small and medium-sized enterprises, the reason why the firm scale is selected as the agent variable, relatively different firm management decision-making mode has obvious differences, the data is also relatively easy to collect, has certain rationality and verifiability. At the individual level, personal traits such as self-control, cognitive ability, and experience level of managers play a key role in the firm development[13], especially when the two jobs are combined, this personal trait can be better demonstrated. Therefore, this paper chooses duality as the agent variable to measure the individual level of management autonomy, hoping to reflect the importance of individual autonomy effectively.

The larger the scale of firm, the greater the organizational inertia. Large firms tend to follow the existing organizational structure and articles of association, in addition, the average profit of firms with high capital concentration is relatively small, so the two play a negative regulatory role. The combination of two positions means that the chairman is also the general manager, so that the general manager will have more power to act according to their own preferences, so the combination of the two positions plays a positive adjustment. Based on the above analysis, the following assumptions are made:

H6a: Capital-intensity negatively regulates the relationship between age heterogeneity and firm performance.

H6b: Capital-intensity negatively regulates the relationship between gender heterogeneity and firm performance.

H6c: Capital-intensity negatively regulates the relationship between term heterogeneity and firm performance.

H6d: Capital-intensity negatively regulates the relationship between education level heterogeneity and firm performance.

H6e: Capital-intensity negatively regulates the relationship between occupational background heterogeneity and firm performance.

H7a: Firm size negatively regulates the relationship between age heterogeneity and firm performance.

H7b: Firm size negatively regulates the relationship between gender heterogeneity and firm performance.

H7c: Firm size negatively regulates the relationship between term heterogeneity and firm performance.

H7d: Firm size negatively regulates the relationship between education level heterogeneity and firm performance.

H7e: Firm size negatively regulates the relationship between occupational background heterogeneity and firm

performance.

H8a: Duality positively moderates the relationship between age heterogeneity and firm performance.

H8b: Duality positively moderates the relationship between gender heterogeneity and firm performance.

H8c: Duality positively moderates the relationship between term heterogeneity and firm performance

H8d: Duality positively moderates the relationship between education level heterogeneity and firm performance.

H8e: Duality positively moderates the relationship between occupational background heterogeneity and firm performance.

## **4 RESEARCH DESIGN**

### ***4.1 Sample Selection and Data Sources***

This paper selects the data of listed companies in Shanghai Stock Exchange of China in 2019. In this paper, the variables are mainly derived from the Cathay Pacific database, and the extraction of key information in the annual report of small and medium-sized board listed companies. To ensure the reliability of the data, the screening conditions are as follows: (1) Financial companies are excluded because of industry particularity; (2) ST enterprises are excluded; (3) Enterprises that can not obtain comprehensive background information of executive members are excluded. According to the above principles, through the screening of listed enterprises before April 3, 2020, the data of 167 listed companies are finally collated for use.

### ***4.2 Variable Measurement***

#### *1) Independent variables*

Age heterogeneity and Term heterogeneity are continuous variables, and the standard deviation coefficient method is used to measure. Gender heterogeneity, Heterogeneity in educational level and Occupational background heterogeneity belong to the classification variable, so the HHI index method is used to measure.

#### *2) Dependent variable*

This paper used ROE to measure organizational performance, because ROE comprehensively reflects the operating costs, liabilities, and profitability of enterprises, and can accurately reflect organizational performance.

#### *3) Moderating variable*

According to the previous researches, management autonomy is divided into three dimensions: environment, organization and individual dimension. The agent variables are capital intensity, firm size and Chair-CEO duality respectively. Capital intensity was expressed by total assets divided by operating income. Firm size was measured by the logarithm of the total assets of the company. In this paper, the dichotomy method is used to set the dummy variable to reflect Chair-CEO duality, in which the value of CEO's two positions is 1, while that of CEO is 0.

#### *4) Control variables*

Team size can affect their ability to obtain information, make investment decisions to deal with problems and so on. The number of members of the top management team were used to measure the team size. Enterprises will not remain stagnant. The development space of small and medium-sized enterprises is relatively large, so we should eliminate the impact of this factor. Price/book value was used to measure the firm's development potential.

## **5 RESULTS ANALYSIS**

### ***5.1 Descriptive Statistical and Correlation Analysis***

The descriptive statistical analysis results of this paper are shown in Table 1. According to the sample data, the average age of senior executive team is about 49 years old, indicating that most of the executive members at this age have relatively more experience and decision-making ability. At the same time, we can find that most of the top

management teams have the right number (6 people) to avoid the negative impact that too many people may bring.

It is found that the average heterogeneity of the remaining independent variables is relatively low except for the gender itself, which indicates that the heterogeneity level of the top management team in China is low, which accords with the relatively strong collectivism atmosphere in China. The capital intensity in the adjustment variable is also relatively high, which is in line with the main characteristics of the large number of firms. With regard to the price-to-book ratio index, the analysis value is relatively high and normal.

As shown in Table 4-2, it can be seen from the correlation analysis between the variables that there are variables with significant correlation. The variance inflation factor was chosen as the statistic to test the multicollinearity. The results showed that the VIF didn't exceed 7, so there is no multicollinearity problem between the models.

TABLE 1 DESCRIPTIVE STATISTICAL ANALYSIS OF SAMPLE VARIABLES

variable	Mean	Standard Deviation	Min	Max
Age heterogeneity	0.1822	0.0340	0.1058	0.3572
Gender heterogeneity	0.6775	0.2192	0.2021	0.7979
Term heterogeneity	0.3648	0.1971	0.0206	0.7520
Educational level heterogeneity	0.2931	0.1799	0.0406	0.3792
Occupational background heterogeneity	0.2670	0.1624	0.0541	0.3625
Firm performance	0.1124	0.0752	-0.1399	0.4966
Capital-intensity	3.4520	8.1564	0.2201	72.9800
Firm size	9.6729	0.6246	8.3100	12.8200
Duality	0.5131	0.0819	0.0000	1.0000
Team size	6.3200	4.1360	3.0000	20.0000
Growth	4.0171	4.7112	0.3502	51.9573

TABLE 2 CORRELATION ANALYSIS

	Age	Gen	Time	Edu	Exp	ROE	CI	ES	DUA
Age	1.000			-0.402	-0.001	0.148	0.133	-0.112	
Gen		1.000							
Time			1.000						
Edu				1.000	-0.142	0.132	-0.326	0.339	
Exp				-0.142	1.000	-0.267	0.654	-0.390	
ROE				0.132	-0.267	1.000	0.142	-0.037	
CI				-0.326	0.654	0.142	1.000	-0.803	
ES				0.339	-0.390	-0.037	-0.803	1.000	
DUA									1.000

## 5.2 Multiple Regression Analysis

Because the multicollinearity test has been carried out, this paper will use SPSS software to carry out multiple regression analysis using forced regression method. The results are shown in Table.3

According to the results of Table 3, the values F of model 1 and model 2 are significant, and there is a significant linear relationship.

The regression results of model 2 are shown in Table 3. Firstly, at significant level of 0.05, the regression coefficient between gender heterogeneity and firm performance is -0.077, so hypothesis 2 is verified. Secondly, at significant level of 0.05, the regression coefficient between term heterogeneity and firm performance is -0.285, so hypothesis 3 is verified. Thirdly, at significant level of 0.05, the correlation coefficient between education level heterogeneity and

firm performance is -0.118, so hypothesis 4 is verified. The remaining assumptions are not valid.

According to Table 3, the adjusted  $R^2$  of model 3 is larger than that of model 2. At a significant level of 0.05, the regression coefficient of capital intensity  $\times$  term heterogeneity in model 3 is -0.130, which shows that capital intensity negatively moderates the relationship between term heterogeneity and firm performance, so hypothesis 3a is verified. Similarly, at a significant level of 0.05, the regression coefficient of capital intensity  $\times$  career background heterogeneity is -0.108, so hypothesis 5a is verified. In addition, hypothesis 1a,2a,4a does not verified.

TABLE 3 REGRESSION ANALYSIS

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Control variables</i>					
Team size	-0.041	0.354	0.499	0.354	0.374
Growth	0.373	0.905	0.920	0.782	0.889
<i>Independent variables</i>					
AH		0.254	0.216	0.253	0.296
GH		-0.077*	-0.024	-0.145*	-0.179*
TH		-0.285*	-0.286*	-0.252*	-0.193*
ELH		-0.118*	-0.050*	-0.199*	-0.180*
OBH		0.101	0.128	0.089*	0.163
<i>Moderating effect</i>					
CI			-0.287*		
CI*AH			0.016*		
CI*GH			0.169		
CI*TH			-0.130*		
CI*ELH			0.077*		
CI*CBH			-0.108*		
ES				-0.277*	
ES*AH				0.012*	
ES* GH				0.161*	
ES*TH				-0.215*	
ES*ELH				0.066*	
ES*CBH				-0.105*	
DUA					-0.215*
DUA*AH					0.020*
DUA*GH					0.1557
DUA*TH					-0.122*
DUA*ELH					0.062*
DUA*CBH					-0.110*
<i>F</i>	11.883*	5.028*	5.508*	4.555	4.913
<i>R</i> <sup>2</sup>	0.141	0.746	0.800	0.768	0.781
Adjusted <i>R</i> <sup>2</sup>	0.129	0.597	0.655	0.599	0.622

According to Table 3, the adjusted  $R^2$  of model 4 is larger than that of model 2. At a significant level of 0.05, the regression coefficient of firm size  $\times$  term heterogeneity in model 4 is -0.215, which shows that firm size negatively moderates the relationship between term heterogeneity and firm performance, so hypothesis 3b is verified. Similarly, at a significant level of 0.05, the regression coefficient of firm size  $\times$  career background heterogeneity is -0.105, so hypothesis 5b is verified. In addition, although hypothesis 1b, 2b, 4b passed the significance test, they did not play a negative moderating role, therefore, these hypotheses were not verified.

According to Table 3, the adjusted  $R^2$  of model 5 is larger than that of model 2. At a significant level of 0.05, the regression coefficient of duality  $\times$  age heterogeneity in model 5 is 0.02, which shows that duality positively moderates the relationship between age heterogeneity and firm performance, so hypothesis 1c is verified. Similarly, at a significant level of 0.05, the regression coefficient of duality  $\times$  education level heterogeneity is 0.062, so hypothesis 4c is verified. Although the regression coefficient between duality and gender heterogeneity was 0.1557, it did not pass the significance test, so hypothesis 2c did not verified. In addition, the remaining assumptions are also not valid.

## 6 CONCLUSION

### 6.1 Results Analysis and Discussion

Through empirical analysis, the negative correlation between gender heterogeneity, tenure heterogeneity and educational level heterogeneity and firm performance is verified. The greater the gender heterogeneity of the members of the senior executive team, the relative balance between men and women in the team, often because of the disagreement in decision-making can not reach agreement, it is likely to miss excellent investment opportunities and so on, which has a negative impact on firm performance. The length of tenure will affect the communication between members, team members with large term differences often communicate less, and the lack of communication will make executives unable to make accurate decisions quickly and reduce enterprise performance when dealing with complex business environment. The difference of education level is also reflected in the communication and investment decision of the members, and the different education level will cause the communication between the members to be blocked, and the high probability of investment decision will be affected, so it will have a negative impact on the firm performance. In terms of years, age heterogeneity is not closely related to work and is therefore not significant. Different professional background has a promoting effect on firm performance, and can more comprehensive judgment whether it is worth the investment decision and so on, so it has not passed the negative test.

The results show that the agent variables of the three dimensions of management autonomy all play a moderating role. At the environmental level, two of the five assumptions of capital intensity are verified, that is, capital intensity has a negative moderating effect between team term heterogeneity and career background heterogeneity and firm performance, respectively. The higher the capital intensity, the more members will be. Apart from the advantages of the professional background itself, the term heterogeneity of team members changes from disadvantage to advantage among the more members, and the original influence becomes weaker. At the organizational level, there are five assumptions about the firm size. Two assumptions are verified. The larger the firm size, the complementary characteristics among members make the influence of term heterogeneity weakened. At the individual level, two of the five assumptions about the moderating effect of the duality are valid, which proves that the dual plays a positive role in regulating the relationship between the heterogeneity of the top management team and firm performance. If the chairman and the general manager are concurrently appointed by the same person, the power they have will be magnified to make the impact of heterogeneity more extensive, so it plays a positive catalytic role.

The reason why some assumptions are not valid when verifying the moderating effects. One reason is closely related to the selected sample data, most of the small and medium-sized enterprises in China are still in the growth stage, the top management team is relatively short, and its system is not perfect, which makes the heterogeneity advantage of the team can not be shown, mainly showing negative impact. Secondly, senior managers in the process of management will gradually form their own unique behavior, different management values make decision-making mode is also very different, and then affect firm performance. in the regulatory role of these three dimensions, gender heterogeneity as a moderating variable. Neither has been verified, and the number of male and female members may not be closely related to the work, so it does not reflect its role and has no obvious influence on the relationship with performance.

### 6.2 Practical Implications

As the backbone of the firm, to a large extent, the top management team's investment decision-making behavior is



closely related to the survival and development of the firm. Establishing a firm-friendly management mechanism would improve the efficiency of members and allow them to communicate and collaborate, especially with top management teams. According to the conclusion of this paper, it is more appropriate to select the appropriate personnel to form the top management team after taking full account of the environment, organization, and individual situation. Specific recommendations as follows:

Firstly, we should consider the professional knowledge, ability, behavior pattern and demographic characteristics of team members. Because the top management team often needs to make investment decisions, and there are often unexpected situations in the process, then the individual's knowledge reserve and processing ability need to reach a level that can be dealt with; the top management is the leadership of the firm, and the employees often learn their behavior habits out of admiration, so the executive members need to lead by example; the demographic characteristics of the team members also need to be taken into account, such as age, education level and so on will affect the communication among members to some extent.

Secondly, to consider the values and cognitive patterns of team members, it is often difficult to measure these by specific values, most of the time, from the age, gender, tenure, education level, professional background and other representative, and easy to obtain data to study and analyze, and finally make a judgment choice.

Thirdly, to consider the size of the organization, R&D investment and other factors, the development preferences of different firms are different, which has a greater correlation with the decision direction of the executive members, so we should fully consider the environment and form the top management team according to the firm's characteristics.

## ACKNOWLEDGEMENT

This work was supported by MOE (Ministry of Education in China) Project of Humanities and Social Sciences (No.20YJC630022), Shandong Province Natural Science Foundation (No. ZR2017MG033), Fundamental Research Funds for the Central Universities (No.HIT.HSS.201875).

## REFERENCES

- [1] Bai J.K., Li H.Y., Qu L.X. How does heterogeneity of top management team affect strategic change in dynamic environment- An Empirical Analysis Based on the data of listed companies on the SME Board of Shanghai and Shenzhen stock exchanges[J]. *Macroeconomic Research*, 2017,2: 157-168.
- [2] Jackson S E, May K E, Whitney K. Understanding the dynamics of diversity in decision-making teams[M]. *Team effectiveness and decision making in organizations*, Jossey-Bass, San Francisco, CA,1995: 204-261.
- [3] Zhou H. Li R.S. The Heterogeneity of Top Management Team, CEO's Power and the Quality of Internal Control[J]. *Journal of Shanxi University of Finance and Economics*, 2018, 40(1): 83-95.
- [4] Wang Y.P., Mao Q.L. Research on Internal Control Moderates Relationship between R&D Investment and Enterprise Performance: Based on Shenzhen Stock Exchange Experience Data of Advanced Technology Enterprise[J].*Science and Technology Management Research*,2017,37(22):141-148.
- [5] Hambrick D C, Finkelstein S. Managerial discretion: A bridge between polar views of organizational outcomes[J]. *Research in organizational behavior*, 1987, 9(4):369-406.
- [6] Zhang S.B., Zhang Z.X. Managerial Discretion: Grabbing Hand, Futile Hand or Helping Hand?[J]. *China Management studies*, 2014, 9(4):153-173.
- [7] Lian Y.L., Zhou B., He X.G., Wen D.W. Performance Aspiration, Managerial Discretion and Strategic Change[J]. *Economic Research*, 2015,8:31-44.
- [8] Yang L. Gu H.F., Li S.L. Top Management Team's Experiences and Corporate Cross-Border Growth Strategies: The Moderating Effect of Managerial Discretion[J]. *SCIENCE OF SCIENCE AND MANAGEMENT OF S.&T.*, 2018, 9(39):101-118.
- [9] Heyden M. L. M, Van D.S., Reimer M, et al. Perceived environmental dynamism, relative competitive performance and top management team heterogeneity: examining correlates of upper echelons' advice seeking[J]. *Organizational Studies*, 2013,34:110-120.
- [10] Knippenberg D V, Ginkel W P V, Homan A C. Diversity mindset and the performance of diverse teams[J]. *Organizational Behavior & Human Decision Process*, 2013, 121(2):173-183.

- [11] Zhao X P, Chu P Y, Chen C Y. Perceived managerial discretion and firm performance: The moderating role of market competition[J]. *Social behavior & Personality*, 2010, 38(7):145-157.
- [12] Gao X., Jing R.T., Wan Y.Y. Empirical Study on Managerial Discretion, CEO Compensation Firm Performance[J]. *Management Review*, 2012, 24(4):107-114.
- [13] Hambrick D C, Finkelstein S. Managerial discretion: A bridge between polar views of organizational outcomes[J]. *Research in Organizational Behavior*, 1987, 9(4):369-406.
- [14] Dess, G.G. and Beard, D.W. Dimensions of Organizational Task Environments[J]. *Administrative Science Quarterly*, 1984, 29(1), 52-73.

## AUTHORS

<sup>1</sup>**Pengbin Gao** was born in Shannxi Province on September 9th, 1979. He received the B.S. degree in Business Administration from Harbin Institute of Technology, Harbin, China, in 2001 and the M.S./Ph.D. degree in Technology Economy and Management from Harbin Institute of Technology, Harbin, China, in 2005 and 2013, respectively. He is currently an Associated Professor with the School of Economics and Management, Harbin Institute of Technology, Weihai, China. His research interests include innovation management and technology management.

<sup>2</sup>**Yiyuan Zhang** was born in Henan Province on June 17th, 1998. She received the B.S. degree in Management in Hainan University, China, in 2020. She is currently pursuing her

master's degree in Business Administration in Harbin Institute of Technology, Weihai, China. Her research interest is innovation management.

<sup>3</sup>**Yan Xiang** was born in Heilongjiang Province on December 21st, 1997. She received the B.S. degree in Business Administration in Northeast Forestry University, in 2019. She is currently pursuing her master's degree in Business Administration in Harbin Institute of Technology, Weihai, China. Her research interest is innovation management.

<sup>4</sup>**Shaocong Bo** was born in Xinjiang Autonomous Region. She is currently pursuing her B.S. degree in Business Administration in Harbin Institute of Technology, Weihai.