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The Effect of Female Participation in Top Management Teams on the Firms' Innovation of Chinese Growth Enterprise Market (GEM) Companies

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Abstract:

According to the social changes, the gender gap is getting smaller recently. Therefore, in recent years all over the world especially developed country and also including China the rise of women right has attracted social attention. At the number of scholars is increasing to explore how female participant in the labor force especially in top management teams (TMT) affects firm's corporate performance. However, there are few scholars that study the impact of female executive in the technological innovation. This article examined the emerging role of female in top management teams (TMT) and firm innovation in the emerging Chinese Growth Enterprise Market (GEM) during 2016-2108. In the meanwhile, we examine how human capital of female executive and industry differences moderate the relationship between female executive and firm innovation. The result shows that female executives have no significant relationship between the participation of female executive and technological innovation. In different industry factor companies in the technology and telecommunications industries have a higher level of technological innovation.

Keywords: Female executives, Firms' innovation, Chinese Growth Enterprise Market (GEM)

1. Introduction

Now a day, various studies have been done to examine at the role of gender in firms' innovation performance. Entrepreneurship is a key factor in create innovation and increase market competitiveness. For gaining competitive advantage and increasing market share, innovation is a key of firm to maintain its competitive advantage. Now, in China women entrepreneurs have become one of the main factors of driving the economic growth. Therefore, many scholars have noticed that gender diversity factor was related to corporate performance. A women's participant in leadership team can enhance corporate performance better than male-only (Baojie C., Ping Z and Wu). The research show that female executives have positive effect on business operations (Hong Q.), but, there are some research pointed out that the gender of management has no significant impact on business operations, women and men manage differently for innovation (Pons et al.,2016). In the Growth Entrepreneur Market (GEM) is extremely important for the consistency of economies and also play the key role in the development of innovation productivity and it is a new industry with high growth. GEM in China was accommodating energetic scientific and technological innovation. The GEM theoretical model represents the causal mechanism developed to represent the impact of entrepreneurship on growth, being the national economic growth the major dependent variable (Reynolds et al., 2001, 2004). Thus, it is worth to explore how female participant in top management team effect on firms' innovation does.

The purpose of this study is examined the relationship between female participant in top management team and firms' innovation, and examine the relationship in the context of the female executives' human capital and industry different. Show as below in model framework.

1.1. Literature Review

In recent years, Chinese government attempt reducing women's unequal employment and also to protect women's right. There is still a lot of work to be done in this area, such as promoting equality in women's education, improving relevant laws and supporting public services. Women around the world have been given equal opportunities, and Chinese companies have played a prominent role in this regard. Therefore, giving women equal employment opportunities is essentially a basic right and empowerment. Data from the World Bank also shows that the proportion of Chinese women participating in work is much higher than the world average.

Many scholars in recent years have studies the relationship between female participation in top management team and firm innovation. Even though, the evidence of literature is remaining indecisive. There are some propose that female participation in top management has significant positive effects, (Smith et al, 2006) using the data of 2500 Danish firms during the period 1993-2001, found that the positive effects of women in top management on firm performance as measure by using gross profit to sales and the positive effects of women leaders strongly depended on the qualifications of

female top manager. Some evidence shows that there is inhibited relationship in some cases. Collecting the survey from 469 business leaders in India (Christopher, Jamie and Carrie, 2017) found that female business leaders perceive their environment as less munificent than male business and female leaders also perceive more difficulty to generate the resource for innovation opportunities. (Suranda S. et al, 2001) collected data from 200 entrepreneurs in Java of Indonesia, found that the distribution of enterprises by sectors varied significantly by gender and the result showed that male-owned business grew at a higher rate than female-owned. Nevertheless, there are few evidences no significant in female participant in top management team on firm's innovation. By using the data in the period of 1996-2000 (Campbell et al., 2008) found that the percentage of women on board director and firm value was not significant. (Carter et al., 2010) using the sample firm in the S&P 500 index of 641 United State firms, discover unable to find out any significant relationship between the number of women participants and innovation. Some scholars find that female-owned firms have lower level at firm size, growth and sustainable (Hisrich and Brush, 1984), (Zhao et al, 2009)

In addition, there are few researches discussed on the topic in China. (Ren Ting, 2010) selecting the data of Chinese private enterprises in 2008 as a research sample, measured by Tobin's Q it is found that women participation in the top management team has significantly improved the economic performance. Using a sample of Chinese GEM from 2009-2010 (Ting and Zheng, 2010) examine a positive relationship between the gradation of female participation and firm performance, the positive relationship was invigorated by female executive's human capital and social capital. (Ping and Qi, 2012) also found that female executives had a positive significant on technological innovation and human capital was strengthened the positive significant effect of female executives on innovation performance too.

To summarize, the conclusion from the previous studies is obscure, some evidence shows that there is no significant relationship in some case and some shows negative relation, it may be due to different samples and methods selected. Moreover, GEM have been playing more important role in China's economy in term of productivity, employment and innovation. However, about the participation of women senior executives in the authorization of inventions for technological innovation on the GEM has limited amount of this topic research. This article will focus on the proportion of female executives created on China's GEM, using public data from GEM listed companies to explore the participation of female executives in entrepreneurship on the impact of corporate innovation.

1.2. Theory and Hypotheses

Innovation is a firm important role to ensuring firm survival and growth. Board gender diversity can lead to improved decision-making quality and also leading to improve creativity and innovation. In addition, (Schumpeter) affirmed entrepreneurs in technological innovation. Support for this review is provide by (Srivastava and Lee), who found that the higher the heterogeneity of the corporate executive team, the more likely it is to become a leader rather than a follower of the industry, and to launch new products earlier and faster than competitors. (Hillman and others) also believe that companies with a high degree of gender diversity can obtain better talents and can send positive signals to the labor market and product market. Closely related to firm value and firm competitive is firms' innovation. (Kochhar and David) used the number of new products developed by the company as a measure of the level of technological innovation. Other studies with similar finding include (Arundel and Kabla, Ahuja et al.) used the number of patents applied by companies to measure the level of technological innovation. (Hansen and Hill, Feng Genfu and Wen Jun) adopted the ratio of R&D expenditure to sales Ratio to measure enterprise technological innovation and (Wu and Tu) used per capita R&D expenditure to represent the level of technological innovation of enterprises. On the other hand, (Arundel and Kabla, Ahuja et al.), find the level of enterprise technological innovation by patents. In this study also selected this method to be dependence variable in order to find out the effect of female executive in firms' innovation.

1.2.1. The Influence of Risk Awareness of Female Executives on Firms' Innovation

Innovation is firm main factor role in ensuring firm growth and survival, innovation also sustain a firm's competitive advantage (Linder 2003, Datta et al., 2005). But, innovation represents the culmination of a risky. The role of various leader gender and characteristics influence the pursuit of various business opportunities. According to leader gender role played upon the psychology women are more risk avoidable than men (Arch 1993 and Byrnes, 1999). Moreover, women are more likely than men to prefer low risk low return venture opportunities (Kepler and Shane, 2007). The research of (Lavin et al., 1998) also support this view, his studies show that men are more likely to engage in risk seeking behavior than women and women are more motivated to choose less risky alternatives than men when making decisions (Ansic and Powell 1997), and women reveal greater fear of failure than men colleagues (Wangner, 2007). In upper echelons theory (Hambrick and Mason 1984), state that organizational, outcome strategic and performance depend on top management team managerial background characteristics. For instance, (Bental, Jackson and Murry, 1989) recognized that top management team demographics related to innovation and firm performance respectively. (Nishii et al. 2007) reported that the diversity of top management team with respect to gender, ethnicity and disability interconnected significantly with adoption of diversity practices in these three domains. So, female risk repugnance also has been proffered as a clarification for observed differences between men and women in their willingness to pursue a range of entrepreneurial opportunities (Gupta et al., 2009). In accordance with, female risk aversion, leader gender may make firm propensity to invest in innovation. (Hisrich and Brush, 1984) found that firms established by women entrepreneurs tend to rely more upon reformations of existing products rather than product innovations. Lately, the research show that men tend to generate more patents and exhibit greater focus on R&D than female workmate. (Marvel, 2015). So, if gender differences in risk preferences leader discernments of innovation opportunity favorability, it identify the factors which contribute to such differences may provide perception of how innovation can be encouraged by female executives. Gender diversity of the board directors can improve corporate innovation (Miller and Triana, 2009). (Mahadeo et al., 2012) found that the

proportion of female directors on the board directors has a positive effect on firm performance. Lastly, making decision and strategic choices, such as the decision to invest in innovation, decision makers assess a firms' ability to both create value as well as appropriate value (Nickerson et al., 2007; Schulze and Anokhin 2009) thereby, female executives will instead become the role and force that inhibits in the firm's investment in innovation and technological innovation, different genders possess different attitudes and beliefs. Thus, we propose the following:

- H1: The participation of female executives has a positive correlation on corporate technological innovation.

1.2.2. Industry Differences and Technological Innovation

Different industries have different market structures, different customer base and technological innovation levels are also obviously different, because of every industry have their own target customer. Currently, Chinese firm focus on technological innovation and also focus on gender diversity too. So, in previous research of (E.g., Chirwa) found that in consumer-led industries (such as food the retail industry of food, beverages and tobacco products, the retail of clothing and footwear and department stores), women-owned companies have higher profit margins than male-owned companies. The main innovations of this study are focus on in every industry does female executive affects firms' innovation. The hypothesis and industry type in the table1 show as below:

- H2: There are significant differences in technological innovation among enterprises in different industries.

Industry	Including Specific Business Type	Number of Companies
Materials and Energy Industry	Basic material (Materials): Chemicals, metal mining, metal products, Leather forest product, Agriculture products processing. Energy (Energy): Non-ferrous Metals Smelting & Rolling Processing.	18
Industry	Industry (Industry): Manufacturing and equipment, manufacturing, Construction, Industry, Transportation	70
Consumer Goods Industry	Unnecessary Consumer: Broadcast, Media. Necessary Consumer: Retail, medicine	17
Technology and Telecom Industry	Information technology: Hardware, software and communication equipment Telecommunication services: Internet and Relevant services	70

Table 1: Industry Classification of GEM Companies

1.3. The Moderating Role of Human Capital

1.3.1. Female Executives' Human Capital

In this study human capital refer to knowledge skills, level of education. Leaders' personal characteristics are important to affect business operations factor, believes that female directors can bring unique human capital to the board of directors, and extensive human capital is the leadership ability of the executive team an important foundation to be used (e.g. Kesner). Education level can be reflected individual analysis skills, information processing and cognitive ability, these which can increase effectiveness of firm the firms' growth, performance, even though create new innovation. So, the higher education level of executives, the more benefit to the firms (Hambrick et al., 1996). As a human capital the previous study mention to the education level of female executives (Hambrick et al., 1996) found a positive relationship between the average education level of the top management team and firm performance as measured by growth in market share and growth in profits, showing overall benefits from top management teams' education levels. See also, (Camelo-Ordaz et al.) proposed, highly educated executives are more innovative and capable, and are taught executives with lower education levels mainly rely on conventions to make decisions, and they are more willing to maintain the status quo. (Gu Jiajun and Hu Bei) are also believed that the executive team the higher the education level of the members, the more diverse information they can provide. (Hambrick and Mason) have pointed out the executives' background in top management team theory (TMT) had affected on corporate governance and decision making systematically discussed. Board directors' human capital can bring firms benefits (Boyd, 1990). Recently, the distinguishing feature of study was that typically studied top management team demographic variables such as age, education, functional background and similar variable in relation organization outcome (Carpenter 2004).An education level of the top management team (Becker, 1970) found positively associated with the teams' responsive attitude and cognitive ability toward innovation. Therefore, increased female executives' participant is indicated to lead the better business performance, heighten market development and involving innovation. Thus, based on the above evidence, we propose the following:

- H3: The human capital of female executives strengthens the positive correlation between female executive participation and technological innovation.

2. Data and Methodology

Research methodology in this chapter is a tool to solve research problems and explains how it applied to this research and data collection. This section had been divided into 3 parts as follows,

2.1. Research Design

The research is conducted in a quantitative approach for studying the impact of female executives' participation on technological innovation in Growth Enterprise Market. This paper used the sample of listed firms in Chinese GEM board during the period 2016 – 2018. The balanced panel data were mainly collected from the China Stock Market and Accounting Research (CSMAR) database listed on the Shenzhen Stock Exchange from 2016 to 2018, all GEM companies in the city are the research samples. The reason why GEM companies are selected as the research objects is that: GEM companies mainly focus on high growth, high-tech content, new economy, new services, new agriculture, new materials, new energy and new business models, etc. The total number of samples in this paper is 175 firms, will be used to collect data and result will be analyzed according to research objectives. The company profile, Exclusive profile and patent information sheet consent form China Stock Market and Accounting Research (CSMAR) database into formula. The measurement of enterprise technological was measure the level of enterprise technological innovation by grants. The samples as follows:

- We exclude ST and *ST companies which have been specially treated because of abnormal production operations.
- We ignore firms with incomplete information about education level of female executives.
- The final sample consisted of 175 out of 233 firms. The sample are involved 5 industries including specific 7 business type, such as basic material, energy, industry etc. In this paper, we used Arundel and Kabla, Ahuja et al. (1998) method, the level of enterprise technological innovation by grants

2.2. Definition and Description Of Research Variables

2.2.1. Independent variable

2.2.1.1. Number of Patents

This research is investigated the technological innovation to measure the level of enterprise technological innovation in GEM which Arundel and Kabla, Ahuja et al (1998) used the number of patents applied by companies to measure the level of technological innovation. This article mainly studies the impact of women's participation in the senior management team on corporate technological innovation, and its focus is to examine whether and how female executives influence their commitment to corporate technological innovation.

2.3. Dependent Variable

2.3.1. Female Participant

Female senior management participation can be measured in participation ratio of female executives, that is, the number of female executives divided by the total number of executives, to measure the position of women in the corporate executive team, the number of female executives includes board of director.

Industry differences variable

This paper adopts the Standard & Poor's global industry classification standard commonly used in foreign empirical research, and divides the research samples into the following four types of industries is materials and energy industry, industry, Consumer goods industry, technology and telecommunications industry. This research to do three dummy variables Induy1, Induy2 and Induy3 in order to represent the industry in which the company is located and determine as table 2: list of variables on technological innovation in Growth Enterprise Market. Industry differences not only directly affect the technological innovation level of enterprises in the industry, but also strengthen or weaken the relationship between female executive participation and enterprise technological innovation to a certain extent. The industry difference as a moderating variable is measured in the same way as the industry difference as an explanatory variable

2.4. Moderator

2.4.1. Human Capital of Female Executives

In this study, the average education level of our female to measure the human capital of female executives' specific. In other words, female executives are divided into 5 levels according to their academic qualifications. Doctoral degree is 5, Master degree is 4, Bachelor degree is 3, Associate degree is 2 and Technical secondary school and below is 1. The average education level of female executives is the sum of the educational qualifications of all female executives in a company divided by the number of female executives.

Variable Type	Name	Variable code	Description
Explained variable	Grant	Grant	Amount of grant
Explanatory variables	Female executives participate	Fepro	The number of women in the corporate executive team divided by the total number
	Industry differences	Induy1 Induy2 Induy3	Induy1: 1= materials and energy companies 0 = non-materials and energy companies Induy2: 1 = industrial enterprises 0 = non-industrial enterprises Induy3: 1= consumer goods industry enterprises 0 = non-consumer goods industries enterprise
Moderator	Female Executive Human Capital	Fedu	(\sum Female senior management education) /Number of female senior management

Table 2: List of Variables on Technological Innovation in Growth Enterprise Market

2.5. Data Analysis

Respondents are collected from the research data; the descriptive statistics will be analyzed using Microsoft Excel along with Statistical Package for Social Sciences program (SPSS) to finding result gathering for any variable and analyzed data descriptive respectively in Research Objectives. Correlation analysis and multiple linear regression will be used to analyze the impact of female executives' participation on technological innovation in GEM.

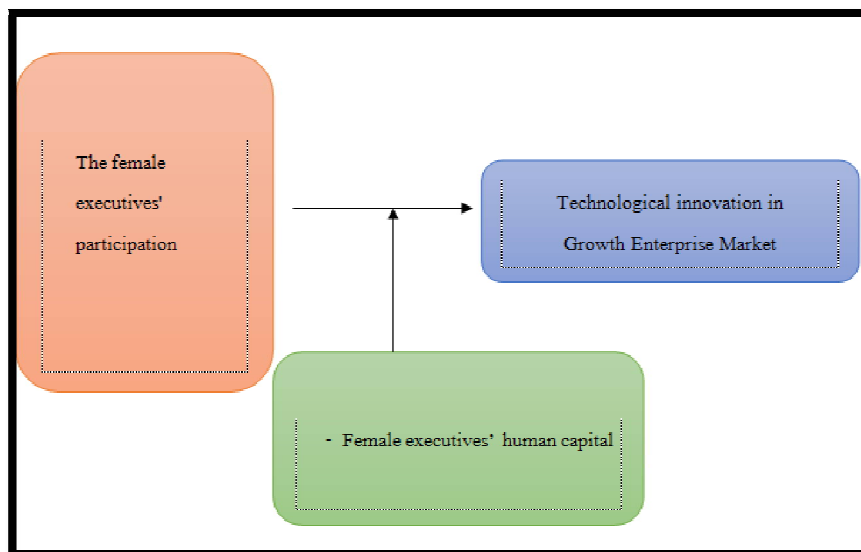


Figure 1: Model Framework

4. Finding and Discussion

In this chapter present the profile of Growth Enterprise Market company, analysis impact of female executives' participation on technological innovation in GEM from 2016 to 2018. 175 companies in Growth Enterprise Market respond to the investigation. The GEM respondents are interviewed by using the specified sampling method was used for data collection. Data was collected using from China Stock Market and Accounting Research (CSMAR) database an was used as a tool to create variables. The empirical data in this paper derive from the China reports of the GEM research programmed carried out in year 2016-2018the variable based on research purpose; include Grant, Female executives participate, Industry differences and Female Executive Human Capital By using is measured in this research.

4.1. Descriptive Statistic

Demographic characteristics and descriptive statistics of the sample are shown in Table 3. Research in this article investigate the 175samples, the average proportion of female executives is .0215, that is, 1out of every company 7-8executives are female while most executive teams are still male governed which present that female executives are still a minority in the executive team. The level of technology innovation is represented by patents is average 11.645 which

represent most industry research and develop the technology innovation. The average female executive human capital is 3.137, indicating that more than %50of corporate female executives have an average education level is bachelor's degree.

	Fepro	Grants	Fedu
N	175	175	175
Mean	0.215	11.645	3.137
Minimum	0.03	0.00	1.50
Maximum	0.59	152.00	5.00
Std. Deviation	0.109	22.139	0.656

Table 3: Demographic Characteristics and Descriptive Statistics of the GEM Company Sample

4.2. Research Hypothesis

For the testing of related hypotheses, this paper uses statistical analysis Software SPSS 26. 0, Correlation the specific analysis results are shown in Table 4. This paper assumes that the participation of female executives has a positive impact on corporate technological innovation, and also assumes that there are significant differences in technological innovation among companies in different industries.

Correlations							
		The number of patents	The participation of Female executive	Induy 1	Induy 2	Induy 3	Female Executive Human Capital
The number of patents	Pearson Correlation	1	-.130	-.125	.270**	-.149*	.057
	Sig. (2-tailed)		.086	.099	.000	.048	.457
	N	175	175	175	175	175	175
The participation of Female executive	Pearson Correlation	-.130	1	-.021	-.075	.132	-.109
	Sig. (2-tailed)	.086		.785	.325	.083	.151
	N	175	175	175	175	175	175
Induy1	Pearson Correlation	-.125	-.021	1	-.260**	-.114	-.008
	Sig. (2-tailed)	.099	.785		.001	.133	.921
	N	175	175	175	175	175	175
Induy2	Pearson Correlation	.270**	-.075	-.260**	1	-.262**	-.131
	Sig. (2-tailed)	.000	.325	.001		.000	.083
	N	175	175	175	175	175	175
Induy3	Pearson Correlation	-.149*	.132	-.114	-.262**	1	.083
	Sig. (2-tailed)	.048	.083	.133	.000		.274
	N	175	175	175	175	175	175
FemaleExecutive Human Capital	Pearson Correlation	.057	-.109	-.008	-.131	.083	1
	Sig. (2-tailed)	.457	.151	.921	.083	.274	
	N	175	175	175	175	175	175

Table 4: Independence Variable and Dependent Variable Correlations

** Correlation Is Significant at the 0.01 Level (2-Tailed)

* Correlation Is Significant at the 0.05 Level (2-Tailed)

4.3. Correlation Analysis

Table 4 reports the Pearson correlation coefficients of the main variable. It can be seen from table 4 that there is a significant as following;

4.3.1. Female Executives and Technological Innovation

- H1: The participation of female executives has a positive impact on technological innovation.

The table 4 show (-.130) there is no significant relationship between the participation of Female executive variable and technological innovation are not correlated as the absolute value of correlation coefficient between the variables did not exceed 0.5.

4.3.2. Industry Differences and Technological Innovation

- H2: There are significant differences in technological innovation among enterprises in different industries.

The three dummy variables Induy1, Induy2, and Induy3 that represent industry differences, Induy1 (-.125) and Induy3 (-.149) are not significant relationship with the level of technology innovation or number of patents, indicating that there are significant differences in technological innovation among enterprises in different industries, which are similar to the predictions of previous research hypotheses, But Industrial enterprises; Induy2 (.270) is a statistically significant relationship with the level of technology innovation or number of patents, indicating that industries enterprise. Comprehensively examining the correlation coefficients between the three dummy variables and grants, it can be seen that companies in non-Induy1, non-Induy2, and non-Induy3 industries are companies in the technology and telecommunications industries have a higher level of technological innovation. as the absolute value of correlation coefficient between the variables did not exceed 0.5.

4.3.3. Female Executives' Human Capital and Technological Innovation

- H3: The human capital of female executives strengthens the positive correlation between female executive participation and technological innovation.

The table show (.057) there is no significant relationship between Female executive human capital variable and technological innovation are not correlated as the absolute value of correlation coefficient between the variables did not exceed 0.5.

4.3.4. Multiple Linear Regression

In order to study the impact of participation of female executives on technological innovation, considering whether female executive have a moderating effect on the relationship between participation of female executives and technological innovation, A multiple regression analysis is used to analyze interval and ratio variable on construct as two regressions models are important as following:

Multiple linear regression equation:

$$Y = \alpha + \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_k X_k + \varepsilon$$

Prediction

$$Y' = \alpha + \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_k X_k +$$

Research

$$Y = \beta_0 + \beta_1 Fepro + \beta_2 Fedu + \beta_k X_k + \varepsilon$$

Where

Y = Technological Innovation

Fepro = Participation of female executive

Fedu = Female Executive Human Capital

Y is the explained variable which represents the technological innovation was calculated by amount of grant each company. Fepro express participation of female executive was calculated by the number of women in the corporate executive team divided by the total number as proportion of female executive and Fedu express female Executive Human Capital was calculated by sum of female senior management education divided by Number of female senior management.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.137 ^a	.019	.007	22.05721

Table 5: Multiple Linear Regressions Statistical Test for Independence Variable and Dependent Variable Correlations

a. Predictors: (Constant), Female Executive Human Capital, Female Executive Participation

For multiple regression analysis specify the results are shown in Table 5. This study assumes that the participation of female executives has a positive impact on technological innovation and also assumes that there are significant differences in technological innovation among companies in different industries while the research found that model in table5 examines the influence of independence variables on technological innovation as the participation of female executive and female Executive human capital have a significant negative impact on technological innovation as model is adjust R² yields is (.019) are ex as well as the data output of female executive human capital and the participation of female executive cannot predict this model because F is more than 0.05. In table 6. Indicating that the participation of female executive and female Executive human capitalis not a stronger role in promoting corporate technological innovation.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1602.519	2	801.260	1.647	.196 ^b
	Residual	83681.515	172	486.520		
	Total	85284.034	174			

Table 6: Analysis of Variance Test for Dependent Variable and Moderate Variable Correlations

a. Dependent Variable: Technological Innovation

b. Predictors: (Constant), Female Executive Human Capital, Female Executive Participation

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.570	9.172		1.370	.172
	The participation of Female executive	-25.315	15.316	-.126	-1.653	.100
	Female Executive Human Capital	1.447	2.562	.043	.565	.573

Table 7: The Regression Coefficient of Technological Innovation

a. Dependent Variable: Technological Innovation

In table 7, the results showed that the regression coefficient of technological innovation (model 1) and interaction term base on the as proportion of female executive or the participation of female executive were not significant. It shows that proportion of female will not lead to extreme technological innovation of company ($\beta_{Fepro} = -.126, p < 0.1$) while female executive human capital indicated female senior management education shows that it will not lead to extreme technological innovation of company ($\beta_{Fedu} = .043, p < 0.1$)

5. Conclusion and Recommendation

This study has focused on the impact of female executives' participation on technological innovation in Growth Enterprise Market. The purpose of this study is to analyze the impact of female executives' participation on technological innovation in Growth Enterprise Market. This chapter presents the suggestions and recommendations. This study evaluated Female executives and technological innovation, Industry differences and technological innovation and Female executives' human capital and technological innovation.

5.1. Conclusion

This paper investigated Chinese GEM companies as the empirical research object to explore the impact of female executives' participation on technological innovation. The main conclusions are as follows: (1) Female executives' participation is not correlation on technological innovation in GEM. ; (2) Different there are significant differences in the degree of technological innovation among industry enterprises; especially industries enterprise has positive correlated with the level of technology innovation or number of patents, (3) The human capital of female executives are not strengthens the positive impact of female executives' participation on technological innovation. The research in this paper not only enriches the literature on the relationship between the executive team and enterprise technological innovation, but also provides new evidence for the development of the theory of high-level echelon and enterprise technological innovation from the perspective of gender diversity, and also provides some evidence for the practice of enterprise management. Valuable enlightenment.

5.2. Suggestions and Recommendations

In order to strengthen the technological innovation of enterprises and improve their independent innovation capabilities, first and foremost, enterprises must attach importance to the role of female executives in the establishment of the senior management team. The research in this article shows that the participation of female executives has not a significant role in promoting technological innovation in enterprises. Therefore, in the selection of senior managers, companies can appropriately tilt to suitable female candidates and attract more outstanding women to join the company's senior management team. Only in this way can the gender structure of the senior management team be improved and the company's innovation activities can be promoted. In fact, the issue of attracting more women to the senior management team has attracted the attention of governments.

Secondly, companies must fully consider their human capital when appointing female executives. The research in this paper found that the human capital of female executives is not strengthened the positive impact of female executive participation on technological innovation. However, companies need to select suitable women with more human capital, such as higher education, more professional knowledge and more experience, to join the executive team; on the other hand, companies also need to increase their exposure to working women, human capital investment of executives, strengthening training and education, to improve the human capital of these female executives, so as to promote them to play a better role in corporate technological innovation activities. Third, for companies in the industries, they should pay

more attention to and play the role of female executives, because in companies in these industries, female executives have a stronger role in promoting technological innovation.

5.3. Limitations of the Study

Although the research in this article has obtained some important new discoveries, there are still some shortcomings: (1) The research in this article only uses GEM companies as samples, (2) Based on the fact that the sample of female executive is too small, this study only examines the impact of female executives' participation rate on technological innovation, and does not examine the difference in the impact of female executives on technological innovation and (3) The influence of female executives on corporate technological innovation is A complex process, and perhaps there are other regulatory variables and intermediary variables not considered in this article that play a key role in this process.

6. Future Research Recommendation

The above shortcomings studied in this article are also the future research directions. In the future, we can try to rationally add some important variables to expand the theoretical model, and carry out empirical research on a larger sample range in China to further test and develop the research conclusions of this paper.

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