Towards the innovation of High-Tech Small-Medium Enterprises (SMEs)- the interview approach

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Abstract: With the fierce competition in the global market, the Chinese government pays more and more attention to the innovation of SMEs, especially to the innovation activities of high-tech SMEs. The research concludes the model-factors influencing the innovation of SMEs, which is based on the past literature research and collect the primary information through the face to face interview. In this research, 50 employees from 10 SMEs around Suzhou, including ten officers from the government, were interviewed. The research result indicated that the key factors influencing the innovation of SMEs are government incentive policies, entrepreneurship, competition, and demand from the market. And based on the research result, the paper constructs the SMEs Innovation Model (SIM), which would be used for further research.

Key words: small and medium-sized enterprises; innovation; high-tech

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1. INTRODUCTION

In the context of the current economic transition, the competition in the domestic and global markets is becoming increasingly fierce. In order to keep up with the trend and maintain the core competitiveness, all businesses are trying to identify the opportunities of innovation and improvement. If Chinese companies want to survive and thrive, innovation will be more critical than ever.

The "19th National Congress" put forward the strategy of actualizing innovation and pointed out clearly that scientific and technological innovation is the strategic support for improving social productivity

and comprehensive national strength, and must be placed at the core of the overall situation of national development.

Some industries in China have made great achievements in the development of the high-tech product and the innovation of the business model. McKinsey (2016) found that China has delivered a good performance in the innovation of efficiency-oriented and market-centric business, such as new energy, e-commerce, high-speed trains and mobile phones. SMEs are the main carriers of science and technology transformation, and their role in the innovation is more and more important. According to the statistics from the Chinese government, SMEs occupy over 70% of China's technological innovation. Xu (2006) analyzed that SMEs obtained over 65% of patents and 80% of new product development.

However, actually, SMEs' innovation motivation is not strong. In that the size of SMEs is small, financial resources are insufficient, and their ability to withstand risks is weak. They intend to adopt a low-tech development strategy to reduce costs. In addition, although some SMEs gradually realize that technological innovation affects the sustainable development of enterprises significantly and are conducting innovative operations, it is common for their innovation achievements to be damaged by other companies without proper punishment. Law enforcement is weak that patents and other intellectual property rights are not adequately protected, leading to the disintegration of the innovation initiatives.

Furthermore, SMEs' innovation activities mainly rely on talents and high-skilled employees. SMEs are too small to attract those high-level employees and bear the increasing employment costs of senior employees. In addition, the cost of living in the cities within the Yangtze River Delta Region is higher than that in other regions in China.

However, how to build and develop innovation capability is a huge challenge for small and medium enterprises. According to the Chinese statistics yearbook (2016) states that 65% of SMEs closed in the past 5 or 10 years. The survival rate of SMEs only arrives at 10% in the last ten years. The founder of the management of such enterprises should find the approaches to deal with this hurdle affecting sustainable growth.

This research purpose is to find what are the key factors driving technology-based SMEs to carry out technological innovation. The method this research employs is a qualitative approach based on the interview with the owners or the management of SMEs located around Suzhou city. This research selects Suzhou because it is one of the most developed cities in the Yangtze River Delta and a national high-tech industrial base is established in this area. Furthermore, our research attempts to propose a model that can develop further quantitative analysis.

The research result indicated that the key factors influencing the innovation of SMEs include the government incentive policies, entrepreneurship, competition and the demand from the market.

2. LITERATURE REVIEW

2.1 The definition of innovation

Today, each government is advancing innovation all over the world. The organizations are proposing business innovation. But the innovation, a term with a broad meaning, does not have generally accepted definitions. Traditionally, for a long time, the industry and academia always simply consider innovation as R&D activities. And most past researches thought R&D as the only method of innovation. Such a research definition hypothesis ignored most of the other innovation activities of enterprises. Actually, some of the recent survey and industry practices have shown that business innovation was diversified that people could think before. The old concept of "innovation" is no longer adapted to the individual enterprises' strategic decision-making, and further causes many enterprises to feel the confusion of innovation (Kuratko, Covin, & Hornsby, 2014).

The past literature always confused the innovation and R&D in practical research. And then, such research would cause the credibility and validity degrade of the research outcome about the influencing factors of innovation. Actually, R&D should be only part of the innovation of enterprises. Dosi (1988) stated that innovation could be the form of "search, find, experiment, develop, copy, or adopt new production engineering or organization structure". Jensen (2007) concluded that there were two types of innovations: a science-oriented model, theory-technology-innovation, or the R&D driving innovation. The other is an innovation based on the experience of production engineering, as the new business model. Santamaria L et al. (2009) indicated that innovation could occur in industries and SMEs with deficient levels of R&D capabilities, or even without R&D activities. For example, innovation from the service industry is always be ignored by the public. However, the enterprises within the service industries can emerge innovation based on the service manner, or the interaction approach between the enterprises and their customers (Johne & Storey, 1998). Kuo, Kuo, & Ho (2014) indicated that the new business innovation approach would challenge the traditional operation process in the finance sector, like the bank and insurance industry. Therefore, innovation is supposed to be considered as the idea or way to create or improve (Garcia & Calantone, 2002).

In this research, the broad meaning of innovation was adopted. As in the current, it is a trend that the concept of innovation will become more and more diverse and it is important to understand their development and influence on the enterprises. In addition, the interviewees of our research come from

various industries or departments that are experiencing innovation, such as manufacturing, trade service, Internet, finance department and so on.

2.2 Past literature review

Prior research has done from different perspectives about enterprise innovations. The innovation is the most important driver for the enterprises' success and growth (Cho and Pucik, 2005) in such an intensively competitive business environment. Artes (2009) studied the Spanish enterprises and found the market competition would influence its innovation capability. The more intensive competition the enterprises face, the more driving forces there are for enterprises to enable innovations (Lee, 2009).

The traditional organization growth model is innovation activities that would drive the development and technology progress of enterprises (Cohen and Levinthal, 1990; Grossman and Helpman, 1994). Van Dijk et al. (1997) researched that the innovation would provide more profit opportunities to the enterprises, and in turn, the profit would finance the enterprise for more innovations.

The factors or variables influencing the innovations are so abroad that any random combination would lead to different research conclusions. But in summary, the past research about the factors can be categorized into internal and external factors.

The incentives or grants from the government are one kind of external factors and have an influence on the innovation of SMEs.

The National Innovation System theory (Nelson, 1993) and the Triple Helix theory (Etzkowitz and Leydesdorff, 2000) both mentioned that government is one of the crucial factors to push forward the innovation capability of the enterprises. In addition, Nelson (1959) indicated that the enterprises' innovation and R & D activities have a non-rivalry effect on society. Because the innovation of SMEs is promoting the development of the society, thus, the government has the incentives to support the innovations, which benefits the innovation activities in return. (Jue, 2018).

Zemplinerová (2010) and Cerulli and Poti (2008) researched the Italian companies and found a positive relationship between policy and innovation. Mairesse and Mohnen (2005) indicated the positive effect of R&D investment on the innovation output based on the survey of the French manufacturing enterprises. Zemplinerová and Hromádková (2012) even indicated the scale positive effect of the companies on the innovation by analyzing the Czech Republic industries database.

The past literature has listed the following elements related to government incentives:

1) Tax incentive, direct R&D subsidy, special loans (Aerts et al., 2004; Almus and Czarnitzki, 2003; David et al., 2000; Hall and van Reenen, 2000; Martin and Scott, 2000, Borrás and Edquist, 2013);

2) Law or policies protection, like patent, Tax rate discrimination;

3) Indirect fiscal support, including public procurement, professional service, and regulations for the talent (Chudnovsky et al., 2006, Sharif and Baark, 2009).

Guan and Yam (2015) investigated that financial support from the government played a significant role in the entity's innovation activities. Even some scholars thought that the tax incentives were more useful than the direct government R&D subsidy (Zhang & Guan 2018). But the preferable tax policies were considered as the primary tools to push the innovations (Qiu and Tao, 1998).

However, some studies have given conflict conclusions. Lerner (2000) that more government subsidy would be perceived to be more positive than less. But Zhang and Wu (2014) suggested that the government's financial support would have more drawbacks, sometimes even hurdling the innovation initiatives.

The market factors are external factors as well. The suppliers, customers, and competitors would feel the enterprises' innovation change through the service process or the products (Christensen and Rosenbloom, 1995).

The final innovation purpose of an enterprise is to meet the market's expectations. The intensity market competition would inspire the innovation willing of the enterprises (Deng, Jean, and Sinkovics, 2012). Choi (2015) researched that exporting firms tended to spend more money on innovation activities because new product or service would increase market sales and the customer's satisfaction. Brouwer and Kleinknecht (1996) indicated that the export market had a positive effect on innovation through empirical studies. Even in the domestic market, the market concentration had a significant influence on both large and small firms (Belsowics and Jakubiak, 2009). Also, Wan, Ong, and Lee (2005) performed the empirical study on Singapore 71 companies and concluded that the market size was very important for innovation.

At the same time, the external resources, knowledge, expertise from the external business partners, including suppliers, customers, are good sources for the enterprise to search the innovation directions, these resources can push the enterprise forward the innovation, even there are few formal collaboration agreements between them (Dahlander & Gann, 2010). Lokshin, van Gils, and Bauer (2009) already researched that enterprises could comprehend their own capabilities with the customer's skills to generate technology innovations.

Internal factors consist of the leadership and the structure of the team as well as internal innovation capabilities.

The founders or Leaders are always performing the key roles in the innovation activities

(Mumford & Licuanan, 2004), Rosing et al. (2001) indicated the relationship between leadership style and the innovations based on the meta-analysis approaches. A proper leader can make the enterprise achieve effective and efficient innovation atmosphere, which could inspire the creativity and technological innovation capabilities (Li & Zheng, 2014; Tsai, Horng, Liu, & Hu, 2015).

Among the past research projects, there have been different discussions about the relationship between the diversity of the management team and the innovation.

Bantel and Jackson (1989) studied the diversity of the educational level of the management team and working experience was positively associated with the innovation of enterprises. Although the widely accepted concept about entrepreneurship is an individual act, the team spirit or the "partnership culture" is gradually dominant in modern business, and Gartner et al. (1994) indicated that the management of new ventures was usually a shared effort. Particularly, for the new high technology enterprises, which are mostly established by a team, not an individual (Roberts, 1991). The diversified educational background, knowledge and experience could shape the initial idea and strategy (Beckman, 2006). The management team can also determine the types of opportunities to mobilize resources, as well as the ability to use these resources to innovate and generate revenues. However, some studies also indicated that there were negative connections between management diversity and innovations (Van der Vegt and Janssen, 2003). Maybe the diversity of the management team can bring the new idea, but diversity can also have an obstacle function in the implementation of the innovations arising from the difficulties and conflicts.

The internal capabilities include many factors, such as employees, internal knowledge management, productivity, and technology, etc. And the internal R&D and innovation capability would increase the success probability of innovation. (Conte & Vivarelli, 2014). Adler and Shenbar (1990) addressed that innovation capabilities assist the enterprise in developing new products or services based on suitable technology to meet the market's expectations. And Dadfar, Dahlgaard, Brege and Alamirhoor (2013) researched that better internal innovation capabilities could produce new product categories based on the current product portfolio.

Some of the empirical studies had shown the positive relationship between productivity and innovation. (Lööf and Heshmati 2003, Griffith, Huergo, Mairesse, and Peters 2006, Vakhitova and Pavlenko 2010, Halpern and Murakozy 2009, Dotun 2015). Financial capabilities are also one of the most important factors for innovation (Lorenz, 2014). Mahendra, Zuhdi, and Muyanto (2015) researched that financial strength would influence innovation motivation and other activities. Compared with large companies, SMEs have limited financial resources to invest in innovation and development activities. Sometimes capital intensity has much more influence on SMEs than on bigger companies (Belsowics and Jakubiak, 2009).

3. RESEARCH QUESTIONS AND RESEARCH METHOD

3.1 Research theory and method (case study and qualitative research)

In this research, the qualitative method based on the surveys and face to face interview approach would be selected. The multiple case studies would be conducted to identify the factors driving technology-based SMEs to carry out technological innovation with all the information collected from the surveys and interviews.

Firstly, SMEs do not have an annual report to disclose the detailed operation information, and the innovation has a very broad meaning as well. Therefore, in order to find the relative importance of different factors to the innovation of SMEs, the first step should prioritize the factors from the survey. The questions in the surveys are designed to be open-ended instead of multiple-choice questions that are predetermined by the researchers in advance. This approach can provide deeper information about the superficial phenomenon. Secondly, a face-to-face interview approach will be conducted with the owners or the management of SMEs located around Suzhou city.

The interviewee would be asked questions related to the innovations with about 20-30 minutes. The questions are mainly about the kind of innovation in their organizations, the importance of innovation to their enterprises, three factors that influence their innovation activities and the relationship between their organization culture and innovation activities. The questions are all open-ended and the interviewees can express their opinions and the main points of their thoughts. The interviews were recorded during the process. Afterward, the reply would be collected to code the keywords about the innovation around the core questions. There are two steps in the encoding process. Firstly, to prevent missing keywords, each interview will be carefully listened to and re-listened. The topics and subtopics were then coded more carefully. Some of these themes are derived from past literature. Others are developed out of the case.

Finally, multiple case studies will be conducted in this research. A case study is the best approach to construct the theory after the analysis of the problems and phenomena arising from the management practice (Eisenhardt, 1989). The purpose of the research is-which factors would influence the innovation in SMEs". This is exploratory research. The research would try to find a conclusion with the common features from the multi-cases study. The multiple case

studies can verify the findings in the different individual cases and confirm the common features (Yin, 1994). Additionally, the multi-case study would be more reliable and valid than the individual case study.

The research selected the qualitative method based on the survey and interview for two main reasons. On the one hand, the research difficulties on the innovation of SMEs are the statistics information. Because the innovation form of SMEs is diversified according to the different industries or operations of SMEs, and the innovation of each SMEs has its unique characteristics. In addition, most SMEs cannot afford the operation of a formal R&D department, which may lead to the missing data of this kind of innovation operations from the government statistics. Therefore, it would be inappropriate to conduct this research based on public statistics. The investigation method of survey and interview is more suitable in this research because the primary data can be collected from this approach, which is more direct and accurate than the secondary data from the public statistics.

On the other hand, the advantage of open-ended questions in the survey and the interview approach is that they allow the interviewee or those surveyed could have the freedom to express themselves. All of the textual information collected provides a useful source of primary information for research as well, which can provide the guidance findings for the further quantitative findings. Compared with the closed-ended questionnaires, the open-ended questionnaires avoid the interviewees or those survey ones solely focus on the choices predetermined in advance by the researchers. However, the disadvantage of the open-ended questionnaires would be time-consuming and labor-intensive (Piqueras-Fiszman, 2015).

3.2 Research samples and data collection

The research target is the owners or the management of SMEs located around the Suzhou city, which is one of the most developed cities in the Yangtze River Delta. A national high-tech industrial base is established in this area.

Among all the cities in Jiangsu Province, the comprehensive strength of science and technology innovation in Suzhou has been among the best for ten consecutive years. According to the Suzhou Municipal Government, its investment in the research and development activities accounts for 2.78% of GDP, the rate of contribution to the scientific and

Enterprise	Industries	Employee No.	Annual Revenue (RMB)	Main Business	Location	Establishment History
A	Internet	195	50M	E-commerce service	Suzhou	2001
B	Manufacturing	320	10M	Trolly manufacturing	Suzhou	1995
C	Pharmacy	270	90M	Traditional Chinese medicine	Changshu	2010
D	Internet	230	66M	IT service	Wuxi	2008
E	Chemistry	350	300M	Raw material	Wuxi	2012
F	Medical instrument	50	20M	Medical test instrument	Suzhou	2011
G	Biology	45	50M	Biology R&D	Suzhou	2013
H	Manufacturing	150	25M	Mechanical pieces of equipment	Suzhou	1999
I	Manufacturing	470	58M	Precision manufacturing	Suzhou	1994
J	Trading	40	80M	International trade	Suzhou	2000
J	Trading	40	80M	International trade	Suzhou	2000

Figure 1: The basic information of sample enterprises

technological progress reaches 64.5%, and the output value of high-tech industries makes up a relatively significant share (47.7%) of the total output value of the year. (Suzhou Statistics Bureau, 2019). At present, society and economy are constantly changing, and the emergence of high-tech industries has become an important technology to promote economic growth in this century. He (2016) made an explanation on how high-tech industries can promote economic development from three aspects. Firstly, compared with other industries, the high-tech industry has greater added value, faster upgrade rate, higher return and lower risk with the investment, which brings great advantages. Secondly, the high-tech industry has also effectively improved the labor productivity of employees. Finally, the presence of high-tech industries has changed traditional technologies and accelerated the development of enterprises. Therefore, increasing the development of high-tech industries is significant to the economy of Suzhou. In addition,

with the ideal economic foundation, abundant human resources, convenient water and land transportation conditions and sufficient foreign investment, Suzhou has great opportunities to develop the science and technology innovation, which makes it a great target to conduct this research as well.

In this research, 50 employees from 10 SMEs around Suzhou, including ten officers from the government, will be interviewed. The background data of the targeted enterprises are shown in Figure 1. The 50 employees of 10 SMEs are from different positions in their company, including the owner or the founder, the CEO, or the general manager, the technology or operation middle level manager. Figure 2 shows the employees' demographic information. The ten government officers are the staff responsible for the supporting governance of SMEs innovations. The participants' demographics are shown in Figure 3.

Then this research would compare the comments from the enterprises and government officers.

3.3. Context and ethics

During this research, ethical issues have been considered in the interview and questionnaire designed. When the samples were selected, they are told about the confidential agreement and the purpose of the research. If they have any concerns before or during the interview, they can actively quit from the research. And all the names shown in the paper have been replaced by the anonymous name. The analysis and final findings did not include any private information. Also, the participants have not been asked any sensitive or private questions.

Position	Number of Participants	Average working experience	Number of Participants who attend the innovation directly
CEO/Founder	10	12	10
R&D Manager(or Director)	12	9	12
Operation Manager	9	8.5	8
Employees	5	4	5
HR manager	2	7	1
Quality Manager	3	8	2
Manufacturing Manager	9	9	7
Total	50		45

Figure 2: The participants' demographics from enterprises

Government Officer	Department	Responsibility	Related experience years	Location
Zhou	Financial bureau	Government subsidy	8	Suzhou
Li(1)	SMEs service center	Policies and talent subsidy	5.5	Suzhou
Wang	Economy development committee	A subsidy, Project Financing	10	Suzhou
Han	Science and Technology IT bureau	Technology Cooperation	3	Suzhou
You	Science and Technology IT bureau	Patent	5.5	Suzhou
Li(2)	Government PE	VC for SMEs	4.5	Suzhou
Ji	Enterprise development service center	Preferable policies application	7.5	Suzhou
Yu	Tax bureau	Tax policies approval	6.5	Suzhou
Zhao	Technology service center	Technology Cooperation	6	Suzhou
Qian	Science and Technology IT bureau	Business incubator	6	Suzhou

Figure 3: The participants' demographics from government

4. RESEARCH FINDINGS

The analysis approach was performed as follows. Firstly, single meaning words were abstracted from the interview recordings, such as "good working conditions", "harmonious working atmosphere" etc. but concluded the single meaning "innovation and R&D infrastructure or environment", from the multi-meaning descriptions like "useful instrument or technical background of the co-workers". Secondly, combine abstracted words with similar meanings. The unrelated responses were subtracted from the information collected, like "good-good study, day-day up". Finally, the research concluded several findings from the surveyed information. The final valid keywords abstracted from the enterprises' interview information add up to 306, 209, from the government. This paper found three constructs from the interview, which are 'Innovation cooperation', 'innovation orientation' as well as a new concept 'intellectual property transaction platform' (IP transaction platform). The IP transaction platform is a platform that can provide financial support or other skills for entrepreneurs or talents to transform their intellectual achievements into new products, services or processes and then become a successful business.

4.1 Innovation cooperation positively influences the innovation activities of SMEs

Among the existing kinds of literature, few papers studied the relationship between the innovation cooperation and the innovation activities of SMEs. De Marchi (2012) and EmanueleGiovannetti (2017) indicated that cooperation had a positive impact on R&D and enterprises' innovation. This research obtains the same results in the innovation activities of SMEs. Specifically, innovation cooperation with the research institutions, the business partners in the supply chain, and the service intermediaries positively influence the innovation activities of SMEs.

Participant	Expression
Richard(CEO)	1. The innovation investment is huge for our revenue. The investment does not only include the R&D infrastructure investment, now the most significant challenge for us is to attract the talent if there are excellent cooperation opportunities with the research institution and university, but we can also have more innovation activities.
Jackie(R&D)	1.Now we are not worried about the innovation capabilities, but we want to have more opportunities to cooperate with the suppliers or customers. Because sometimes when we have changed the new design. We should find the new suppliers or take some time to explain the new innovation thought to the suppliers or the customers in order to ensure the smooth of the supply chain.
Joe(Quality)	1. Last year, we have a software update on our product, but the suppliers can not ensure the quality of raw material for the product, then the launch date of the new product was delayed for several months. 2:Our new product software update was completed with the assistance of the local industry research institute.

Figure 4: The participants' expressions

4.1.1 Innovation cooperation with the research institutions

From the above interview quotation, SMEs are more eager for the innovation resources, because, in practice, the resources in the SMEs are always much scarcer than that of larger companies. How to obtain the sufficiently necessary resources used to innovations is a problem that should be solved by these SMEs. The third party plays some crucial roles in the innovation of the enterprises. These third parties include the intelligent property agents, the universities or academy institutions, or other industries associations. All of these third parties can form innovation networks for SMEs. These networks can extend and improve the SMEs' own resource base by introducing complementary contributions and resources (Davenport, 2006). At the same time, these

organizations can reduce the cost incurred in the inter-enterprise resources match or exchange.

The related academy or the research institution has many theoretical research achievements ignored by the larger companies. These theoretical achievements also requir8e practice guidance from SMEs in order to produce more practical results. From this perspective, the research capability and innovation resources can be useful compensation to its owner's internal innovation team. It is assumed those SMEs and the related academy or research institution can exchange synchronously and freely through their cooperation relationships, which would improve the effectiveness and efficiency of the innovation development of SMEs.

4.1.2 Innovation cooperation with the business partners in the supply chain

Some studies indicated that collaborating with the business partners in the supply chain, such as suppliers, customers, or the competitors in the same or related industries, could improve enterprises' chances of looking for outside innovation opportunities and responding to the dynamic market efficiently. (Dyer & Singh, 1998; Nooteboom, 1999). The greater cooperation with the upstream or downstream business partners can also exchange the resources, information, or innovation initiatives, making the enterprise obtain more core competence (Masten and Kim, 2015). Any SMEs are not an independent entity in the supply chain from the raw material to the final customers, so the innovation, no matter it is the product or process innovation, SMEs should conduct coordination with the suppliers or the customers. Therefore, the innovation cooperation from the supply chain business partners can assist the enterprise in managing more knowledge related to the innovation (Purwaningrum and Yaniasih, 2012). The cooperation also provides the opportunity for the partners to share the industry latest information (Du et al., 2012), smooth the supply chain (Ramanathan, 2013), which can reduce the innovation risk (Quoc Le et al., 2013) and increase the effectiveness and efficiency of the innovation.

Therefore, innovation cooperation with the supply chain partners would be considered as one of the crucial factors influencing the development of the innovation activities of SMEs.

But how to obtain the innovation information from the supply chain business partners has been ignored by the prior researches. Chen et al. (2009) indicated that one of supply chain effectiveness ensured the enterprises both maintain the transaction opportunity with the business partners and obtain the customers' expectations change timely. Therefore, the enterprise should exploit supply chain capability to look for innovation awareness, improve the efficiency of innovation activities and strengthen its competitive advantage by combining the value chain from the initial suppliers to the final customers.

Meanwhile, supply chain management can ensure the innovation information more complete and smooth the flow of goods. The resources are distributed among the enterprises within the supply chain loop. And these resources would strengthen the enterprises' capability to innovate and find new opportunities. Also, the resources are very important for enterprises to foster their core competencies and competitive advantages. In other words, the enterprises' boundaries are not limited due to the supply chain changing the innovation resources with the transactions flow. Especially when the enterprises have innovation in the product, it would depend on the cooperation in the production process. Then the supply chain capability can reduce the adoption period for the supplier to cooperate with the new product.

4.1.3 Innovation cooperation with the intermediary service business partners

Some recent studies indicated that the outer connection of new enterprises could promote their external innovation search. Innovative search can be seen as a problem-solving activity that firms use to solve problems and create new products by combining knowledge elements. Through external innovation search, new enterprises can gain innovation capability by mastering the technology of other enterprises and organizations. However, under the business environment of globalization, it is characterized by the convergence of industries and rapid technological changes. No enterprise can grasp every opportunity it discovers or has sufficient resources to handle all opportunities. This is why innovative external search is becoming more and more important. Moreover, due to the limitation of internal resources, external innovation search is particularly important for SMEs. The expansion of the external search vision has played a positive role in the new product innovation from three aspects. Firstly, innovation is an information-intensive activity. Information from the service intermediaries covers other firms' products and would make more innovation opportunities for SMEs. Secondly, the extended external search field can enrich the knowledge base of SMEs and provide more choices for an enterprise solution. Through external searches, the SMEs can add new elements to its knowledge reserve. It is easier for them to find new and effective combinations of these elements for innovation activities. Third, the broader range of external search horizons can help SMEs to identify external complementary resources and capabilities, which are most critical to their product innovation.

In fact, SMEs should have a unique advantage over those larger and more mature organizations. Since existing structures and norms constrain big enterprises, it may be difficult to find new uses of existing resources. SMEs can create new products by recombining the various knowledge elements in the external knowledge space, while SMEs are not limited to them.

But in practice, the SMEs' external innovation search may be very difficult to be carried out. Firstly, SMEs do not have a wide range of external search horizons because they do not have much external contact. They tend to rely on the personal network of entrepreneurs to discover opportunities. Secondly, the external innovation search cost would be too high for the SMEs to undertake. Due to limited resources, external searches may be too expensive for them. Additionally, the external search would consume more organizational resources and managers' time. SMEs must balance the cost and benefit of innovation search. But in today's dynamic and uncertain environment, this balance is difficult to achieve.

However, service intermediaries can help them achieve this balance. These intermediaries often serve the enterprise located within a certain region. Because of their frequent interaction with a large number of local enterprises and government, they have formed their own extensive network of relationships. They can often be considered as the warehouse with information, knowledge and opportunity. If SMEs are more closely linked to service intermediaries, the more likely the enterprises are indirectly connected to many parts of the social network of the region. In other words, the links to service intermediaries provide tickets for SMEs to enter local networks.

In the research, three of the sample enterprises have shown a similar linkage relationship with the service intermediaries. The research director of Enterprise D responded:

"The accounting firm engaged has provided us the innovation financing opportunity for us when we want to initiate one production assembly line update."

"The technology consulting firm helps us to find the research team in the innovation of our current R&D system."

Based on the above analysis, this research proposes the following propositions:

The innovation cooperation with the supply chain business partners, the service intermediaries and the related research academy would improve the innovation of the small and medium enterprises.

4.2 Entrepreneurial orientation positively influences the innovation activities of SMEs.

In past literature, studies focused on the relationship between entrepreneurial orientation and performance, instead of innovation (Cemal Zehir, 2015). Birkinshaw (1997) indicated that entrepreneurial orientation is a concept related to decision making and strategic management at the enterprise level, which determines the main operation direction, activities and process of the enterprises. Lumpkin and Dess (1996) defined the entrepreneurial orientation, including three sub-level of implications. That is- innovation or proactiveness, leadership and risk undertaking.

Through the case research, it is found that entrepreneurial orientation drives technological innovation of small and medium-sized technological enterprises in three aspects: innovation, enterprising spirit and risk undertaking.

Schumpeter points out that innovation is reflected in "adopting a new production method", "developing a new product", "opening up a new market", "forming a new organization", and so on.

For example, the sample Enterprise-A is facing the intensive competition market in the electronic products industry globally. The enterprises have developed new products such as streaming media, service software, special disks and other new products through internal technological innovation. The successful development of these new products has further enhanced the core competitiveness of enterprises and also has obtained a competitive advantage. Through more than five years' development, this enterprise has become one of the tier 1 companies. The proactiveness and the entrepreneurial orientation makes the founders of the enterprise is not satisfied with the existing situation of the enterprise. In the interview, he responded:

"I am not satisfied with the current production technology and design. We would change and update to the advanced version next year".

In the research, Enterprise C is a domestic top-class wear-resistant material manufacturer. It was established by the founder ten years ago since the founder graduated from the university. The product is from his research dissertation in the university. Although it has become the leading enterprise in the industry, but it continues to pursue better. In the research interview, the founder responded:

"I have my ambition to be a first-class enterprise since the first day when I established the enterprise. I think this is an important point leading the enterprise to achieve technological innovation many times."

The sample enterprise E is the first high-tech enterprise specialized in the research, development and industrialization of chemistry printing material in China. The mission and vision of enterprise development are to be the best material supplier in the international chemistry printing industry. In the interview discussion, the board of directors respon*ded:*

" When the Enterprise was founded, we stimulate the entrepreneur's innovation consciousness and keeps the enterprise alert to the market opportunity which has not been recognized before".

Entrepreneurial orientation also embodies the capability of bearing the related risks. The founders of the CEO with a high level of entrepreneurial orientation should be willing to take risks. With the change of the business environment, the process of innovation is often faced with greater uncertainty. For example, in the research, the sample enterprise B is located in the corrosion detection industry, the industry has been experiencing the rapid upgrading of

technology and the short period of product replacement. Then the enterprise B is to be confronted with the large uncertainty in the implementation of technological innovation. The CEO of the enterprise responded in the interview:

"Although there are great risks in technological innovation, once the products are not innovated, the products will gradually lose the market, and it will be difficult for enterprises to survive in the long run, and it is also necessary to take risks in order to survive and develop."

Based on the above analysis, this research proposes the following propositions:

Entrepreneurial orientation is the soul of technological innovation. It can influence the innovation culture in the enterprise. Through innovation, leadership and risk-bearing, Entrepreneurial orientation drives the technological innovation of small and medium-sized technological enterprises. The stronger the entrepreneurial orientation, the more it will be able to drive the innovation of small and medium-sized scientific and technological enterprises.

4.3 The innovation capabilities positively influence the innovation activities of SMEs.

The related industry technologies would be the innovation basis for the enterprises. Some of the past researches have shown that the technology capability was a determinant for the enterprise's innovation (Cohen and Levinthal, 1990; Fabrizio, 2009; Nieto and Quevedo, 2005).

Most innovation activities depend on employees and the internal capacities of the enterprise. Specifically, the core competence of science and technology-based SMEs are supported by technology, its continuous technological innovation depends on technology innovation capability, and the innovation capability depends on a research and development team composing of a group of technical innovation employees, which provides the core resources of technological innovation.

In the research, of which, four enterprises have a high level of innovation employees. For example, Enterprise A has abundant accumulation in the research, development and production of new chemistry printing materials, and it has the technology research and development team with a young doctor, master. The enterprise has the complete ability from product design, development to industrialization. At the same time, it is investing heavily in innovation activities every year, many of their technology and products are in the industry-leading level, and it has completely independent intellectual property rights. One of its employees in the interviews responded:

"All of the team members are graduated from the first-class university or the research institution. They are smart and straightforward to communicate with the innovation idea."

"The meeting or discussion with the advanced high education level colleague would easily produce the innovation idea or research methodology."

Enterprise D has very high-level R & D employees. All of them are all returned from abroad. The core R & D staff members have doctorate degrees and graduated from Australia National University, Royal Melbourne Polytechnic University and other internationally famous institutions. These high-level innovation employees have strong R & D capability, remarkable technological innovation achievements. Now the enterprise has produced more than 20 invention patents.

Dewar and Dutton (1986) researched that difference in the number of professionals and professional groups within an enterprise change the depth and breadth of knowledge. The more experts it has, the wider the knowledge base it has. And a large number of experts can make new technologies and ideas easier to understand.

Due to the rapid technological upgrading and the need to master a large amount of new knowledge, on the one hand, enterprises need to recruit excellent technical R & D employees from domestic colleges and universities to enrich the R & D team. On the other hand, it is necessary to combine "invigorating" and "training" in the team and strive to build a "learning organization." Enterprises need to spend a certain amount of money every year to organize various learning activities to encourage R & D employees to participate actively, which would improve their R & D capabilities and increase the speed of technological innovation.

Based on the above analysis, this research proposes the following propositions:

The innovation team is the implementer of technological innovation of SMEs, and innovation capability is the guarantee of the technological innovation drive of SMEs. The stronger the innovation capability is, the more it helps to drive the technology-based SMEs to implement the innovation.

4.4 The market demand and external competition positively influence the innovation activities of SMEs

Market demand is the original driver of innovation of small and medium-sized science and technology enterprises. Any innovation is the application of new knowledge, technology and innovative ideas to new production, the management or sales patterns, create new products, thereby providing customers with better service quality. So the innovation would bring more market share and enterprise benefit. It influences the product, the price, the channel and the promotion of four aspects to varying degrees.

There are many kinds of literature on innovation in SMEs. For example, Chen Xiaohong (2008) studied the relationship between innovation and growth for

small and medium-sized businesses. The empirical results showed that the growth strategy orientation of SMEs is based on marketing rather than technological innovation, which causes the relative neglect of innovation. The failure to deal with the relationship between marketing and innovation leads to the fact that their contribution to market performance is not outstanding.

Based on the previous discussion, marketing has a great influence on the enterprise's innovation. Because it is directly oriented to the market, and the innovation has played a great role in promoting the enterprise's profit growth and even its success.

Some scholars also illustrate the intermediary role of technological innovation between marketing and market performance through different studies. Bill et al. (2011) researched that innovation is a key factor in marketing ability, which can make enterprises play a better role in marketing and bring more returns to enterprises. In addition, some scholars believe that the relationship between market orientation and performance of innovation guides, and that the success of new products mostly originates from market orientation, which means that the marketing of enterprises can feedback information such as market orientation. Then innovation has a role to play between marketing and performance.

In other words, enterprises with good marketing ability can grasp technical market requirements faster and have a positive impact on market performance. At present, there are few kinds of literature to study the relationship between marketing capability and innovation and market performance for SMEs. Therefore, in the research on the marketing and performance of Chinese SMEs, it is necessary to take innovation as the intermediary variable between the two to help us study the survival of SMEs.

To a certain extent, the marketing reflects the customer demand and the supplied degree of the market, as well as the changing dynamics of the internal and external environment of the enterprise, according to which the enterprise can adjust and change the enterprise strategy. For example, the repositioning of consumer personnel will also lead to the development of the product itself according to customer and market demand in order to better adapt to its transformation to achieve a higher level of sales. Product development will also bring technological changes to the enterprise, which influences innovation input and technical staff input. At the same time, the realization of technological innovation will lead to higher product quality and lower production costs, thus bringing higher performance for enterprises.

In the research, for example, enterprise A has held the vision and the promise “Customer-centered and technological innovation as the cornerstones.” 100% of the products provided to customers meet the special requirements stipulated in the relevant standards and contracts, and 100% of the information feedback from customers is responded to in a timely manner, so as to develop products that meet the needs of the customers continuously and improve the performance of existing products. The sales manager of the enterprise responded:

"We would feedback all of the information required by the customers to our team and another related department, which is useful for us to improve the innovation activities, and better the business process."

The enterprise B insists on taking market development as the guide, focusing on the pipeline industry's technical equipment market, covering 15 provinces and municipalities of our country, extensively introducing and absorbing advanced foreign technology and equipment, and strengthening technology research and development. Now it has become a leading professional enterprise in the field of corrosion detection and evaluation. The CEO of the enterprise responded in the research:

"One of our competitive product was from the idea of our competitors

."

"The customers have helped us improved the product quality and sales business process."

The enterprise C focus on the market demand development, its standard innovation process is before the development of new technology, the technical director leads some the innovation team to go deep into user research and listen to their opinions and suggestions on the technical requirements of products. After several years of development, the products are exported to Italy, Germany, Chile, Ukraine and many other countries. One of the employees responded:

“All of the innovation ideas should come from the customer and market demand."

“The standard to justify the correctness of innovation is whether it is from the market."

Market competition forces technology-based SMEs to carry out technological innovation. One of the chief employees of enterprise A responded:

“if the enterprise cannot improve the technology content of products through technological innovation, it will die in the long run.”

Market competition causes science and technology SMEs to produce a sense of crisis and sense of urgency, thus putting pressure into motive force. Because of the fierce competition in the market, small and medium-sized technological enterprises cooperate with institutions of higher learning, scientific research institutes and other institutions to carry out joint work and innovation.

For example, enterprise B cooperated with Tianjin University, Daqing oilfield design research institute and other famous research institutes, etc. Enterprise D work with Tsinghua university network multimedia laboratory and other famous institutions to carry out project cooperation, which is useful for them to obtain the international and domestic advanced technology.

The director of enterprise C responded in the interview:

"If science and technology enterprises want to win the competition, we must achieve differentiation through technological innovation, and we should develop technological innovation faster and better than our competitors. Then the products of the enterprise can stand out in the market competition and gain a good reputation in the industry."

The practice of the research shows that small and medium-sized technological enterprises take the market demand as the orientation, actively develop the technology innovation, and develop the products to meet the customer's demand, gain more market share and obtain more potential profits.

Based on the above analysis, this research proposes the following propositions:

The market demand means the potential income, which drives the technology innovation of the SMEs of science and technology, and the market competition forms the pressure on the survival and development of the enterprise, and further drives the technological innovation of the SMEs based on the science and technology.

4.5 The influence of governance and management team on the innovation of SMEs

Alejandro et al. (2009) indicated that SMEs provide a more direct environment to empirically test the impact of executive team characteristics on corporate strategy and performance compared to other enterprises. The management team's composition includes the sex difference (male, female), age, educational background and the working experience, etc.

Managers' experience and risk propensity would change with age. In general, older, long-serving managers have more experience. When they make decisions, they tend to be reluctant to try things they have never experienced and are more inclined to take conservative decision-making behavior. One the contrary, younger managers with less experience, are curious to try new things and are also eager to show their abilities. Hence, they are more willing to try high-risk strategic decision-making and innovative behavior.

The educational background of the management team can reflect managers' cognitive ability and show the ability to search and process complex information. These abilities of managers are positively related to their qualifications (Chen et al., 2008). On the one hand, the past research considers that the higher the education level of the management team members, the more able to accept the risk, and the easier it is to accept innovation. On the other hand, some scholars believe that managers with higher education can consider the surrounding environment more thoroughly and have a stronger ability to adapt to the environment. To sum up, highly educated managers are more willing to accept new ideas and be able to solve complex problems creatively.

At the same time, the executives tend to their own professional field when faced with strategic decisions. Scholars found that the more senior executives with a background in science and engineering, the more likely they were to implement diversification strategies through innovation, while the more senior executives with financial backgrounds, the more inclined to adopt merger and acquisition to achieve diversification strategy. To sum up, executives tend to be familiar with the professional field when they make strategic decisions, so the decision-makers who adopt innovative strategies such as technological innovation have a professional background of scientific research and technology.

Heterogeneity is also considered as one of the main team characteristics influencing the quality of the management team. It refers to the differences in population background, important cognitive concepts and values among team members. At present, there are two opposite views on the influence of the heterogeneity of the executive team on the strategy. First, from a cognitive point of view, highly heterogeneous teams can more effectively identify new strategic opportunities and new economic changes (Alexiv,2010), which can help enterprises to carry out strategic change and strategic innovation. Second, in terms of the angle of social impact, highly heterogeneous teams can lead to intra-team conflict, resulting in slow decision-making and reduced strategic change (Hambrick, 1996). Carpenter (2001) researched that environmental uncertainty can adjust the relationship between the executive team's heterogeneity and the strategy of enterprise globalization. When environmental uncertainty is low, the senior management team's heterogeneity is positively related to the strategy. Otherwise, the heterogeneity is negatively correlated with strategy.

In the research interview, most of the sample enterprises indicated the same idea about the management's function on the innovations. One of the R&D innovation department managers stated:

"Although we did the R&D on the software, our team is much diversified, who come from different universities with the majors covering electronics, computers, machinery and even English."

Some literature indicated that innovation investment could bring a high return and sustainable competitive advantage to enterprises, but innovation has the features of low success rate, long-period and slow effectiveness. Therefore, executives tend to reduce innovation investment to achieve their short-term target profits. Himmelberg et al. (1999) suggested that SMEs should implement equity or shares incentives to stimulate the middle or top managers to engage in more innovation activities.

In the research, the founder of enterprise B responded:

"We have involved the innovation activities into the share options scheme plan, which is useful for the management team to implement the innovation plan and new ideas."

A better structure of the management team can promote the learning atmosphere within the organization. The most fundamental purpose of organizational learning is to improve organizational effectiveness, make the organization achieve more profits, obtain more support, create, maintain and expand its own customer base.

Secondly, continuous learning can improve its strategic ability, enabling the organization to maintain an advantage in the competition and gain sustained profits in the long term.

While aiming to promote the investment of enterprise innovation and meet the sustainable development of enterprises, SMEs should gradually optimize the construction of the senior management team. From the point of view of promoting innovation, these enterprises should pay more attention to the younger structure and the stability of their team, and avoid the situation of the frequent turnover of other executives. At the same time, SMEs should address more about the executive's professional experience and education, knowledge background; they can hire people with a technical background. When implementing equity or share incentive, the SMEs should be more cautious and establish a good governance mechanism to avoid the problem of executive exit cover.

4.6 The influence of government policies and tax incentives on the innovation of SMEs

The relevant government policies support the technological innovation of SMEs. The government gives preferential tax benefit and project fund support to the technological innovation of small and medium-sized scientific and technological enterprises, which has greatly mobilized the enthusiasm of technological innovation of enterprises, and the innovation results have been fruitful.

SMEs need a large number of talents, material and financial resources in the stage of technology and innovation development, and in the later stage of innovation or production. Also, if the SMEs are continuing to lack of resources and financial support, it is difficult for them to make profits from forming patents or products, which would not be conducive to the development of high research and innovation. The government's supplementary policies send a signal to the SMEs, which makes them have a strong ability to raise funds, but this cannot fundamentally solve the financing problem for SMEs. SMEs also need to get more financial support from the financial markets. And a good financial environment created by the government can reduce the information exchange cost between investors and enterprises. In favor of SME financing, only when the financial environment and the government supplement are combined, it can better solve the problem of financing SMEs, and raise more funds for SMEs to carry out technological innovation.

Although the current financial environment in China is not very good, there are differences between regions, SMEs have a relatively low degree of knowledge and reputation, and their financial support is limited. However, with the continuous improvement of the degree of financial marketization and the slow resolution of corporate financing constraints, the government will continue to increase support to ensure the long-term development of SMEs.

However, the research found the different functions and responses from the government employees and the sample enterprises. The CEO of one enterprise responded:

"The government gave us financial support at the beginning of the development, and also the special funding support for our innovation is very important."

"This year, the government offers many tax incentives for our innovation activities, especially for the R&D project. We can enjoy more tax benefit, which is one of the key factors influencing our continuing innovation activities."

But the government staffs have a different view about the functions of the tax incentive and financial support for the innovation activities. The staff from local technology bureau response:

"Some of the direct innovation funding is not valid in practice because the SMEs did not perform the innovation as they promised."

"The tax incentive can be more useful than the fundings because it is the longer term."

Patents are important resources to bring sustainable competitive advantages to enterprises. SMEs have higher requirements for patents than traditional enterprises and need the protection of laws and regulations. The relevant laws and regulations of the government that provide protection to the technological innovation achievements of SMEs include intellectual property protection, technology contract law, patent law and so on. With intellectual property, technological innovation can be stimulated in enterprises.

Based on the field observations, this research proposed the following factors need to be taken into account: First, in order to help small and medium enterprises understand the latest preferential policies in related areas. The government should establish the related training courses for the SMEs about these policies. Secondly, to help SMEs get government-funded innovation projects, the government should have more central and local financial allocations for scientific and technological research and transformation. In order to cope with the financial crisis in recent years, most of the funds have been directed to large enterprises. Therefore, SMEs usually lack the ability to play games with large enterprises. Third, to give support to the enterprise's new product development, government policies, including tax incentives, government grants, etc., should be provided to enterprises' innovation activities.

According to the summary of the discussion above, the research proposed the following proposition:

The relevant policies of the government provide support for technological innovation of small and medium-sized technological enterprises, and the relevant laws and regulations of the government provide protection for the achievements of technological innovation of SMEs of science and technology type. The greater the government policy support, the more perfect the laws and regulations, the higher the product polarity of driving technological innovation of small and medium-sized technological enterprises.

4.7 Presentation of entrepreneurship

The research shows that entrepreneurship orientation, management team and governance, innovation capability, market demand and competition, government policies and regulations are the key driving factors of innovation in SMEs. In order to present the driving effect of these key factors on innovation more clearly, on the basis of summarizing the propositions obtained above, the driving factor model of innovation of SMEs is constructed. (SIM) model (Figure 5) shows that entrepreneurship orientation, innovation ability and management team are internal drive variables (internal drivers), market demand and competition. Government policies are external drive variables (external drivers).

Entrepreneurs are the advocates and organizers of technological innovation, and entrepreneurs are the soul of the technological innovation of SMEs. Entrepreneurship inspires the innovation team to implement technological innovation, and the R&D team is the implementer of technological innovation of SMEs, and R&D ability provides a guarantee for SMEs to implement technological innovation. Market demand means the potential benefits of technological innovation, which drives SMEs to actively develop new products when the products of enterprises are facing competition in the market. Technology-based SMEs must enhance their competitiveness through technological innovation. The relevant government policies support the technological innovation of SMEs, and the relevant government laws and regulations protect technology-based SMEs' technological innovation achievements. Government policies and regulations further drive SMEs to carry out innovation.

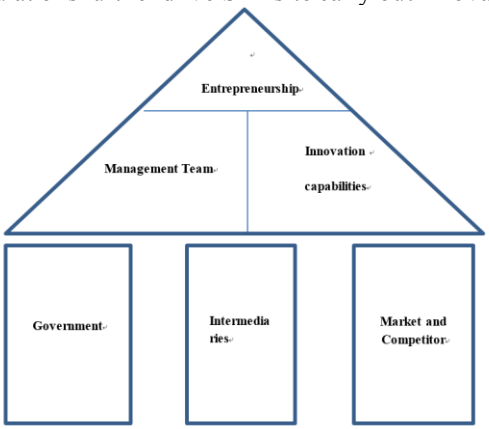

Figure 5: SIM model

From the above analysis, the conclusion from the enterprises and the government is different. Now the government is paying more attention to the direct government subsidies and tax incentives to the innovation activities. But this is not the first priority from the conclusion of the enterprises. Jen-Yi Chen (2018) indicated that the government should never use both types of subsidies simultaneously for any cost-reduction research and development (R&D) effort. The unclear subsidy and not timely following up audit would cause the ineffectiveness and inefficiency of the government grants. The fact that government subsidies to enterprises have not really been used for innovative activities also shows that enterprises have deliberately applied for patents in order to obtain more preferential policies. So how many patents cannot completely reflect the enterprise's technological innovation ability. Moreover, the influence of government subsidy is ineffective. Government allocating resources to support some industries and enterprises selectively is likely to put other industries and enterprises at a disadvantage (Joseph and Johnston 1985). For example, some of the tax incentives proposed in China can not be adopted in certain industries. The facilitative government attempts to promote innovation by constructing institutions conducive to fostering a healthy culture and by aiming policies at overcoming obstacles to private investment in innovation instead of directly influencing the innovation behavior through highly interventionist measures (Sharif and Baark, 2009). Jue (2017) compares the government between HK and Singapore. However, very few studies have taken government intervention as a whole and assessed its overall impact on innovation, which is difficult because of the national innovation system's complexity, the variance across regions in the country, and the mixed roles of government at different levels.

5. CONCLUSION

5.1 Conclusion

In order to survive and thrive under the background of the current global economic transition, the Chinese government is trying to keep up with the trend and maintain the core competitiveness through innovation. High-tech SMEs, as the main carriers of science and technology transformation, plays a significant role in the innovation. However, with insufficient government support, financial resource and talent, their innovation motivation is not strong. Therefore, how to build and develop innovation capability is a huge challenge for high-tech SMEs.

This research purpose is to find the key factors driving High-tech SMEs to carry out technological innovation. The method this research employs is a qualitative

approach based on the interview with the owners or the management of SMEs located around Suzhou city. The research result indicated that entrepreneurship orientation, management team and governance, innovation capability, market demand and competition, government policies and regulations are the key driving factors of innovation in SMEs.

Based on the discussion in the paper, particularly in Section 4 and 5, the government should consider the different incentive tools to help the innovation of SMEs within the local regions:

Firstly, in the regions with a higher level of financial development, the government may reduce direct subsidies, but adopt preferential policies such as taxation to enable the market to play an active role in technological innovation of enterprises in order to improve the efficiency of enterprise innovation. Besides, direct financial support to the innovations of SMEs, the government can consider other similar fiscal support policies. Some of the developed countries have begun to strengthen financial policy support for innovative, technology-oriented SMEs. Their financial support always includes two methods. The first is direct financial support.

Secondly, the government should establish the transaction platform to help innovative entrepreneurs translate their intellectual achievements into successful business enterprises, and the government uses the skills and knowledge of the enterprise, experienced executives, new products, Commercial feasibility tests of processes or services and early commercialization processes provide financial support to assist the innovative entrepreneurs in developing new products, processes or services and making them marketable.

Thirdly, the government usually has a huge purchasing capacity, and government procurement in a specific field, especially the one with innovative requirements, can greatly enhance the innovation ability in this field.

At the same time, it is worth noting that non-R&D innovation, although such innovation is not based on R&D activities, it does require creativity and novelty. At the beginning stage, because it is limited to the weakness of its own R & D ability and resources. It is undoubtedly a realistic choice for SMEs to adopt non-R & D innovation as the main innovation mode. In the process of non-R & D innovation activities, enterprises need to improve the whole innovation process and innovation system through continuous learning, digestion and absorption, so as to continuously enhance the innovation ability of enterprises. After surviving in the market competition, standing on the heel, and accumulating a certain foundation of R & D and innovation ability, we gradually increase the ratio of innovation activities based on technology and R & D, to maintain the development and growth of the enterprise. The method can assist the SMEs to win a sustained competitive advantage.

5.2 Intended contributions

The research can show the relative importance of each factor, which could give the guidance for the SMEs to think further how to develop the innovation culture within their team, and how to organize the innovation in the enterprises. The proposed model ("SIM") could provide guidance to the local government on how to adopt the related approaches to encourage the SMEs forward to innovation. Also, the purpose of this research result can help other scholars prepare the quantitative relationship between these factors.

5.3 Research limitations

Due to the limited research resources and the samples, only limited research samples are adopted in this paper. The samples might not be very typical. In the future, the research can involve more high tech SMEs, or the research could be performed within different industries. More samples research could prove the factor mentioned in this paper further and more persuasive.

Secondly, when the research is performed, it is found that some employees from the enterprises are not clear about the concept the innovation. Sometimes, they have mistaken the innovation with R&D. Then sometimes, even there are many innovative developments in their enterprises, but they can not find them. So this would lead to the error response to the questionnaires. Finally, in order to verify the influencing degree of each factor found in the research, quantitative research can be used to prove the relationships among these factors.

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