

The Effectiveness of Government Policies on Technology-based SMEs and Entrepreneurship:

A case study of the technology-based SMEs in
Beijing, China

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Abstract

The increasingly significant role played by small and medium sized enterprises (SMEs) and entrepreneurship in national economies has attracted growing attention. Recent trends have increasingly emphasised the value of knowledge. The challenge within the 21st century is the importance of the productivity of service and knowledgeable workers, as well as strategic flexibility and innovation. It is suggested that high level of innovation, R&D and productivity are positively related. Technology-based SMEs are specifically selected as the object of this thesis since they exhibit most of the characteristics of the three terms, “SMEs”, “innovation” and “entrepreneurship”.

SMEs may come across significant constraints because of their own limitations, such as financial constraints, human capital shortages, and weak market power. These constraints are even more serious for technology-based SMEs due to their industrial nature. As a consequence, technology-based SMEs tend to have a higher failure rate than non-tech SMEs and large firms. However, the benefits brought by them cannot be neglected. For example, the return of R&D on a social level is higher than the private level, which highlights the importance of technology-based SMEs for national development. Therefore, it motivates governments to increase support for technology-based SMEs.

This thesis aims to examine the effectiveness of government policies on technology-based SMEs and entrepreneurship in Beijing, China. Some researchers have studied and examined the policies, but mainly focussed on the description of policy frameworks and policy dynamics. There is a lack of studies examining the effectiveness of policies from the perspective of entrepreneurs in this context. This thesis fills this gap.

This thesis makes both a theoretical and methodological contribution to the entrepreneurship studies literature through the holistic case study approach. A mixed-method approach of document analysis, interview and a questionnaire are used to understand the interaction between policies and technology entrepreneurs. The key findings of this thesis are that policies have strong positive effects on the promotion of entrepreneurship and SMEs. But there are still some negative points when implementing policies, such as uneven filter criteria and supervision system between new and established firms.

Key words: Entrepreneurship policy, SME policy, technology-based SMEs, entrepreneurship, mixed methods, Beijing, China

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1. Introduction

1.1 Background Context

The Chinese economy has experienced a rapid development since the launch of reform and opening policies in 1978. The potential economic superpower of China has achieved an average annual gross domestic product (GDP) growth rate of 9% for the three decades since 1980 (OECD, 2008; Zhang, 2009), even during the Asian Financial Crisis in 1997 when other high-growth Asian economies declined (Hsiung, 2003). Recent statistical data on China indicated a slight drop, yet a 7.35% of GDP growth was reached in 2014 (WorldBank, 2014).

Since 1978, a series of policies have been enacted in China to encourage the growth of private enterprises, which has also pushed the country from planned economy to market economy (Chen, 2006). Many major state-owned enterprises (SOEs) have quickly transferred to small and medium non-SOEs, which contribute more than half of today's industrial outputs. According to China's National Development and Reform Committee's (2010) statistics, there are some 41.53 million SMEs in China, representing a 4.5% growth in 2009. The total number of Chinese SMEs reached 50 million in 2012, which accounted for almost 99% of all registered enterprises in China (www.sme.gov.cn, 2013).

The growth of entrepreneurship and SMEs (small and medium-sized enterprises) shows positive effects on job creations, productivity growth, innovation growth and economic growth (Van Praag and Versloot, 2008). For example, the statistical data from the EU (European Union) of 2005 shows that 99.8% of registered enterprises are SMEs, and they provided about 75 million jobs, which account for 66% of total employment in the E.U. (Lukács, 2005). Nallari and Griffith (2011) argued that entrepreneurship makes a positive contribution to economic growth and development, and vice versa, mainly through the process of structural transformation, and it is a prime catalyst for job growth. Moreover, the SMEs are also generally considered as the engines of innovation. Baranano,

Bommer, and Jalajas (2005) argue that small firms contribute large numbers of patents and innovations considering their size. Some also suggest that small firms are better innovators due to their more flexible nature (Koberg, Detienne & Heppard, 2003; Qian and Li, 2003).

The increasingly significant role played by SMEs and entrepreneurship in national economies has attracted growing attention from not only scholars, but also policy makers (O'Connor, 2013). For the sake of national development, it is necessary to understand the mechanisms of SMEs and entrepreneurship in order to promote the development of SMEs.

As previously introduced, China has experienced a significant economic growth during the last three decades. However, it should be noted that Chinese per capita GDP is still low compared with the OECD (Organization for Economic Cooperation and Development) average. The per capita GDP of OECD-average is 8.39 times that of China in 2012 (WorldBank, 2014). The gap between the rich and the poor has not decreased with the economic development of China (OECD, 2008).

It has long been acknowledged that the development of China greatly depends on raw materials and energy. China has been known as the so-called “world’s factory” because of the low-cost of raw materials, human capital and other resources. It has not only sped down the common development, but also generated huge environmental problems (Liu and Diamond, 2005). Current Chinese policy trend has been in transferring from only focusing on economic growth to a sustainable growth. An urgent need for a shift from blindly developing economy at the expense of destroying the environment to a development of sustainable businesses, such as the technology industry, is emphasised due to increasing environmental concerns in China (Lewis, 2011). The phrase “industry transformation and upgrading” has been frequently used in recent political documents in China. This concept was first proposed at the 3rd Plenary Session of the 18th Communist Party of China (CPC) Central Committee on 9th November,

2013, which highly recommended the need for sustainable economic growth. It recommended a transformation from capital-intensive industries to ecological and technological industries (Daily, 2013). Accordingly, innovation has become a hot topic in China.

Over the last two decades, there has been a growing realisation that the long-term economic performances of nations, firms and industries depend on their ability to exploit technological innovation (Cohen, 2010). High levels of R&D (Research and Development), high levels of innovation and high levels of productivity are all positively related (Cohen and Klepper, 1992). It is suggested that firms in high-tech industries have contributed more than half of the total GDP in the wealthy economies (Kohers and Kohers, 2000). Moreover, the authors also recommended that the development of high-tech sectors has cut an estimated half percentage point off inflation due to increasing productivity and cost savings (Kohers and Kohers, 2000).

In conclusion, SMEs and innovation exhibit growing importance for the development of national economies, including China, which has attracted increasing attention from policy makers. Therefore, it is worth investigating the characteristics of technology-based SMEs in China.

1.2 Significance of This Study

SMEs and innovation play a critical role in national development. But it should be noted that SMEs may come across significant constraints because of their own limitations, such as financial constraints (Cosh and Hughes, 1994), human capital shortages (Roberts, 1992), and weak market power (North, Smallbone & Wickers, 2001). Especially for technology-based SMEs, they experience double constraints because of their size and industrial nature.

For example, because of the market imperfection, high-tech SMEs are very vulnerable in the capital market. High-tech SMEs mostly hold intangible assets that are hard to value, and also the return on investment is very uncertain

(Carpenter and Petersen, 2002). It is difficult for the technology-based SMEs to get access to the capital market. Moreover, the degree of R&D cost is quite high compared with other general operational costs and the product cycle is uncertain (Hall, 2002). Especially, it has been noted that compared with large firms, the R&D cost is higher for SMEs (Hyytinen and Toivanen, 2005), which again increases the risks of technology-based firms. As a consequence, technology-based SMEs tend to have a higher failure rate than other SMEs and technology-based large firms. However, the benefits brought by them to the national welfare cannot be neglected. As suggested by Hall (2002), the return of R&D on a social level is higher than the private level, which also highlights the importance of technology-based SMEs for national development. Thus, it motivates governments to increase support for technology-based SMEs.

The new documents released after the NPC (the National People's Congress) and the CPPCC (Chinese People's Political Consultative Conference) in March 2014 have introduced a number of policy documents, such as *Some suggestions for improvement and strengthening scientific research projects and fund management of central financial institutions* (StateCouncil, 2014c) and *Some suggestions for accelerating the development of the science and technology service industry* (StateCouncil, 2014b), that could benefit the development of technology-based firms. It is widely acknowledged that the Chinese economy is strongly intervened by policies (Montinola, Qian & Weingast, 1995). Therefore, it is necessary to know how and to what extent do government policies affect technology-based SMEs.

The purpose of this thesis is to examine the effectiveness of government support on technology-based SMEs and entrepreneurship in China. Beijing is selected as the research field because, as the capital of China, the policies implemented in Beijing can be seen as the most mature. Understanding the policies in Beijing can be the first step to interpret the policies of China. This thesis will illustrate the strength and weakness of technology-based SMEs and, furthermore, explore the

advantages and disadvantages of current policies on technology-based SMEs from entrepreneurs' perceptions.

1.3 Aims and Objectives

The main aim of this study is to examine the effectiveness of government policies on technology-based SMEs and entrepreneurship in Beijing, China.

This aim is achieved by the following objectives and related research questions (Table 1-1):

1. To identify the influential factors of entrepreneurship

This objective attempts to explore influential factors of entrepreneurship and to identify the degree to which the external environment encourages entrepreneurial activities, along with what internal factors make individuals become entrepreneurs. It is argued that political, social, and cultural contexts can be seen as important influential factors for the development of entrepreneurship and SMEs (Reynolds, Camp, Bygrave, Autio & Hay, 2002). In addition, how policies (SME policies and entrepreneurship policies) are implemented from policy documents will be also identified.

2. To identify the characteristics of technology-based SMEs

There are two research questions associated with this objective. First research question is to explore the limitations faced by technology-based SMEs. Furthermore, the comparison between state-owned and privately owned firms in terms of the limitations they meet will be examined.

3. To examine the effectiveness of policies targeted at technology-based SMEs and entrepreneurship

The third objective is to examine the effectiveness of policies. The entrepreneurship and SME-related policies which are implemented in Beijing will be explored, and their effectiveness from entrepreneurs' perspectives will be

examined. Finally, the author will also attempt to examine whether the policies affect the views of entrepreneurs towards entrepreneurship environment and the limitations of technology-based SMEs.

4. To explore the differences between on-park and off-park technology-based SMEs

The fourth objective is to examine whether science parks have positive effects on the development of technology-based SMEs and entrepreneurship. First, there will be a comparison between on-park and off-park firms. Furthermore, whether the state-owned and privately owned firms perceive differently in terms of their opinions regarding a science park will be further explored.

Table 1-1: Objectives and Associated Research Questions

Research Aim	
To examine the effectiveness of government policies on technology-based SMEs and entrepreneurship in Beijing, China	
Objectives	Research Questions
1) To identify the influential factors of entrepreneurship	i) How are policies implemented from policy documents?
	ii) How do external and internal influential factors affect entrepreneurial activities?
2) To identify the characteristics of technology-based SMEs	i) What are the limitations of technology-based SMEs?
	ii) Do state-owned SMEs and privately owned SMEs have different advantages and barriers?
3) To examine the effectiveness of policies targeted at technology-based SMEs and entrepreneurship	i) How effective are the policies from entrepreneurs' perspectives?
	ii) Do the policies affect the views of entrepreneurs towards the research question 1(ii), and 2(i)?
	i) What are the differences between on-park and off-park firms?

<p>4) To explore the differences between on-park and off-park technology-based SMEs</p>	<p>ii) Do the legal forms (state-owned and privately owned) affect the result of research question 4(i)?</p>
--	--

Source: Author

1.4 Structure of the Thesis

This thesis consists of eight chapters, including the introduction chapter. This chapter begins by providing a background context and illustrating the significance of this study. China’s government has been promoting the development of technology-based SMEs due to economic and environmental concerns. A number of political documents have been released to support the development of technology-based SMEs. Thus, it is necessary to understand technology-based SMEs from a policy-making point of view. Accordingly, the aims, objectives and research questions are exhibited above.

The second chapter is a literature review, which aims to highlight the relevant literatures and identify the gaps. It begins with an examination of different definitions of SMEs and the complexities of defining them. The importance of SMEs for the development of economy and economic democracy will be also introduced. Furthermore, the review identifies the characteristics of technology-based SMEs and entrepreneurship in the next section. The definition of innovation and the importance of innovation are also exhibited in this section. Finally, the disadvantages of technology-based SMEs and the policies implemented to alleviate those drawbacks will be examined in the last two sections.

Chapter Three provides background information about China from economic and political perspectives. China has been experiencing a noticeable economic growth for the last three decades, but there is a growing gap between the rich and the poor. This chapter uses the secondary statistical data collected from the

World Bank Group, OECD and Statistics Bureau of China to exhibit the development stage of China from an economic perspective. Moreover, China's political system and the developing phases of SMEs will be demonstrated.

Throughout Chapter Four, the researcher introduces the research strategies and methods of extant relevant studies, and makes a case for the particular methodology and methods which are employed in this study. The researcher applied a mixed method case study approach, consisting of elements of document analysis using secondary data, semi-structured interviews and a small-sample survey as primary sources of data.

There are three result chapters. Chapter Five and Six present the analysis of the qualitative data from document analysis and interview. Chapter Five provides background information about how policies are ultimately implemented from policy documents. Furthermore, the latest policy trend and local and science park policies will be illustrated in this section.

Chapter Six builds the results from interview analysis. It begins with an identification of the influential factors of entrepreneurship in Beijing, China. The strengths and weaknesses of the entrepreneurship environment and the internal influential factors (the characteristics of entrepreneurs) in Beijing, China will be explored. Furthermore, the limitations and barriers to start and develop technology-based SMEs in Beijing will be identified. Accordingly, the policies designed to address these limitations will be studied in the following part, followed by an examination of the effectiveness of those policies.

Chapter Seven mainly builds on the results from the interviews by contributing a statistical significance to existing qualitative data. A series of univariate and bivariate tests and other techniques are employed to statistically analyse the questionnaire data.

The scope of the final chapter is to highlight the main findings of the study in light of the four main objectives of the thesis, as well as to present the implications

derived from the findings. This leads to the main contributions of the thesis, both methodologically and theoretically. Following the conclusion of this chapter and the thesis overall, the limitations of this study and the future research will be demonstrated.

2. Literature Review

2.1 Introduction

As highlighted in the introduction chapter, SMEs and entrepreneurship studies are attracting growing attention from not only scholars, but also policymakers (O'Connor, 2013) due to the positive influence of SME growth on economic growth, employment growth and productivity growth. Statistical data from the 1998 Workplace Employment Relations Study in Britain suggested that SMEs account for more than 99% of all businesses and generate over 50% of jobs (Bacon and Hoque, 2005).

Earlier work done by Birch (1981) using data from the United States suggested that the small businesses had been a major source of job creation. More current works have emphasised that not all SMEs create jobs; actually, there are only a small number of high-growth firms that generate net employment growth (Henrekson and Johansson, 2010). Identifying those high-growth firms should be seen as an efficient way to boost employment.

The benefits that a thriving economy and job creation bring have inspired governments to intervene in entrepreneurial activities in both developed economies and developing economies, such as the UK (Huggins and Williams, 2009), Indonesia (Tambunan, 2008) and China (Yu, 1997). However, it is argued that a highly skewed performance distribution shows that a small percentage of SMEs create disproportionate economic growth and innovation (NESTA, 2009), as well as net employment growth (Henrekson and Johansson, 2010). Thus, it is assumed that, to optimise the efficiency of the policies, it is better to focus on a small number of high performance firms rather than on the large number of average performance firms (Coad et al., 2014).

If it is assumed that the main driver of employment growth is firm growth, and superior firm-level capabilities drive firm growth, with better firms growing faster, the obvious implication is that high-growth firms will be highly innovative, or high-tech, or, in some way, superior to their slow growth counterparts (Coad and Reid, 2012). High levels of R&D, high levels of innovation and high levels of productivity are all positively related (Cohen and Klepper, 1992). Thus, identifying high growth firms can start from identifying highly innovative firms. However, recent studies

have argued that the high innovative firms and high growth firms do not overlap to a significant degree (Coad et al., 2014). Although innovation does not necessarily drive growth at the individual firm-level, it can drive growth at the overall economy-level (Coad et al., 2014). Therefore, no matter whether innovation does drive firm growth or drive growth in overall economy-level, it meets the interest of policymakers.

It has been emphasised that small firms are the engines of innovation regarding technology, products and process (Acs and Audretsch, 1988) and, thus, improved the overall productivity (Hall, Lotti & Mairesse, 2009). The empirical studies argued that almost half of the number of innovation activities were contributed by SMEs (Acs and Audretsch, 1988). Small firms are considered as better innovators due to their more flexible nature (Koberg et al., 2003; Qian and Li, 2003) and highly intensive R&D expenditures (Shefer and Frenkel, 2005).

Throughout the literature review, it can be found that many countries implement various policies to support the development of SMEs, entrepreneurship and innovation. China has issued a number of policies to support the development of innovation and some authors have concluded the innovation-related policies in China released since 1980 (Huang, Amorim, Spinoglio, Gouveia & Medina, 2004; Liu, Simon, Sun & Cao, 2011) and examined the effectiveness of those policies. However, those researchers mainly provided the description of the policy framework and compared the policy dynamics. There is a lack of studies examining the effectiveness of policies from the perspective of entrepreneurs. Therefore, the aim of this thesis is to understand the effectiveness of policies on technology-based SMEs and entrepreneurship from the perspective of entrepreneurs.

The literature reviewed in this chapter offers a traditional viewpoint of entrepreneurship as well as the policies associated. This chapter is divided into four principle sections. It begins with an exploration of different definitions of SMEs in Europe, North America and China. The reason that Europe and North America have been selected as examples is that they represent the most developed countries. The importance of SMEs in economic growth and other benefits brought by the development of SMEs will be presented in this section. Subsequently, the review will discuss the definition of innovation and

entrepreneurship. Innovation has long been acknowledged as an integral part of entrepreneurship (Drucker, 1985). Thus, in this section, the definition of innovation, entrepreneurship, technology-based SMEs and, furthermore, the associations between innovation and entrepreneurship will be identified. This section will further discuss the importance of innovation in small firms, why and how SMEs innovate and the relationship between innovation and internationalisation. The third key section will identify the degree to which technology-based SMEs meet constraints. In this section, the financial disadvantages, productivity and human capital disadvantages, and market disadvantages will be studied. Finally, the supportive policies for starting and developing technology-based SMEs will be explored in the final key section.

2.2 Small and Medium-Size Enterprises

It has been emphasised by Schöllhammer and Kuriloff (1979) that there are a number of differences between SMEs and large companies in terms of development patterns, ownership, managerial style and the scale/scope of operations. When providing support, policy-makers should consider the distinctive characteristics of SMEs and provide specific support measures (North et al., 2001). When designing and implementing the policies, policy makers should be aware that SMEs cannot be treated as miniature versions of large firms. As asserted by Shuman and Seeger (1986: 8) :

Smaller businesses are not smaller versions of big business (...) smaller businesses deal with unique size-related issues as well, and they behave differently in their analysis of, and interaction with, their environment.

A clear definition is necessary for identifying SMEs, otherwise it may lead to uneven application of policies and, thus, distort competition across countries. Firstly, the definitions of SMEs in Europe and North America will be clarified in the following part. Those regions represent the most developed economies in the world. Furthermore, the definition of SMEs in China and why SMEs are important will be indicated in the next section. Understanding the different definitions can, to some extent, reflect the different economic systems of China compared with developed economies, which will be further discussed in the document analysis chapter.

2.2.1 Definition of SMEs in Europe and North America

In Europe

In the UK, The Companies Act 1985 formulated a recommendation about SME definition (Lukács, 2005) which depends on employees, annual turnover, annual balance sheet total and the percentage owned by one enterprise. A decade later, the European Commission (EC) (1996) upgraded the definition of SMEs using similar criteria (see Table 2-1). It has been widely applied by the EU, although the maximum annual turnover and the balance sheet total are slightly less than that of the criteria of the Companies ACT in the UK. However, considering the rapid global economic development since 1996, the EC revised the definition of SMEs in May 2003 (see Table 2-2) (Kommission, 2005). The criteria introduced on 1 January, 2005 applied to all policies, programmes and measures that the EC operates for SMEs. The adjustment of the financial thresholds were necessary as, since 1996, there has been an increase of productivity and prices; meanwhile, an important number of enterprises could maintain their SME status to be eligible for support measures (Kommission, 2005). In the new definition, it offers the choice for an enterprise to either reach the annual turnover or balance sheet total ceiling, because, by their nature, some industries have higher turnover figures than others, such as the trade and distribution sectors. It reduces the risk for relatively larger SMEs in certain industries which can hardly meet the average range of criteria and cannot benefit from SME policies.

Table 2-1: EC Definition of SMEs in 1996

Criterion	Micro Firm	Small Firm	Medium Firm
Maximum number of employees	9	49	249
Maximum annual turnover	-	7M Euros	40M Euros
Maximum annual balance sheet total	-	5M Euros	27M Euros
Maximum percentage owned by one, or jointly by several enterprise(s) not satisfying the same criteria	-	25%	25%

Source: DTI, 2001

Table 2-2: EC Definition of SMEs in 2003

Criterion	Micro Firm	Small Firm	Medium Firm
Maximum number of employees	9	49	249
Maximum annual turnover	Less than 2M	2M-10M Euros	10M-50M Euros
Maximum balance sheet total	Less than 2M	2M-10M Euros	10M-43M Euros
Maximum percentage owned by one, or jointly by several enterprise(s) not satisfying the same criteria	-	25%	25%

Source: European Integration Studies, 2005

SMEs in Europe have become increasingly important. They account for a large proportion of the global market and have become international competitors. The turnover growth reached approximately 2.3% in micro and small and medium-sized enterprises during the period 1988-2001, which was just a little below that of large firms (2.6%). In terms of profitability, SMEs and large firms achieved a similar rate of increase (0.4%) for the 1988-2001 period. In terms of employment, SMEs in Europe employed more than 50% of the manufacturing workforce and about two-thirds of services (Baranano et al., 2005). SMEs have become more important as empirical studies on the performance of SMEs during economic crisis periods exhibited better results than that of LCs (Harvie and Lee, 2002).

In North America

It is difficult to provide a universally accepted definition of SMEs. The thresholds can fluctuate widely due to various industry natures. Nonetheless, the U.S. also adopts the number of employees and annual firm revenue as the basic of classification criteria (see Table 2-3). There is no distinct definition of SMEs in the U.S and it depends on the industry in which the company competes. Thus, there are more data limitations, such as inconsistent SME definitions (USITC.gov, 2010).

Table 2-3: Definitions of Small and Medium-sized Enterprises in the U.S.

	Manufacturing and non-exporting services firms	Exporting services firms		Farms
		Most	High value	
Number of employees	<500	<500	<500	<500
Revenue (\$)	Not applicable	≤\$7M	≤\$25M	≤\$250M

Defining institution	SBA Advocacy	SBA/SBA Advocacy	SBA/SBA Advocacy	USDA
Data source	U.S. Census	ORBIS	ORBIS	USDA

Source: (USITC.gov, 2010)

The majority of nonfarm businesses in the U.S (99.9%) are classified as SMEs. These SMEs contribute more than 50% of the total national GDP; among them, both employment and GDP contributions mostly come from the services sectors, followed by manufacturing and mining industries. 89.3% of employer small businesses in U.S. had fewer than 20 employees in 2006 (USITC.gov, 2010).

In Canada, SMEs account for 99% of all registered enterprises and over 50% of the country's employment. Moreover, SMEs have large contributions to national GDP and net job creation (Baranano et al., 2005). The definition of SMEs in Canada is more simplified. Industry Canada, a department of government, considers only one criterion, the number of employees, when defining an SME (see Table 2-4).

Table 2-4: Definitions of Small and Medium-sized Enterprises in Canada

	Employees
Small	1-99 paid employees
Medium	100-499 paid employees

Source: Industry Canada report

It can be found that the criteria of SMEs vary from country to country. There is no globally universal definition for SMEs and it is adjusted by each country according to their own situations. China has also experienced a similar situation in the difficulty of setting standard criteria to define SMEs and the criteria had been changed several times to be geared to the fast changing economic environment. The next section will introduce the Chinese definition of SMEs.

2.2.2 Definition of SMEs in China

Two institutions, APEC (Asia-Pacific Economic Cooperation) economies and China's government (The Ministry of Industry and Enterprise), have defined Chinese SMEs differently. Compared with the definition provided by China's government, APEC economies only used one criterion, the number of employees (commonly 100-500 people) to define the SMEs (Liu, 2007), which is less distinct. Thus, the author has adopted the definition by the Chinese government.

In China, similar to Europe, the number of employees, total assets and annual turnover are adopted to define SMEs, but the range of each criterion is much larger than that of Europe. Unlike Europe, but similar to the U.S., it also specifies each industry and the criteria vary from industry to industry.

Specifically, in 2003, China established a tentative standard of SMEs, but this had been abolished in 2011. Table 2-5 shows the tentative standard of SMEs in 2003 and Table 2-6 is the new edition of uniform standards in SMEs in 2011. As we can see from tables, the new edition of uniform standard had a more detailed classification on industries and size category, and it was the first time that micro firms had been taken into account in China. Furthermore, the criteria changed with different industries. For instance, the information transmission industry with employees between 100 and 2000 could be defined as medium-sized firms, while, in the wholesale industry, employees between 20 and 200 could be defined as medium-sized firms. Moreover, the employment base in 2011 decreased compared with that in 2003, when the total assets and business revenue experienced an increase. As highlighted in the introduction chapter, China is known as the “world’s factory” due to its labour-intensive and capital-intensive economies. The criteria of SMEs in China also supports this point of view. It can be found that the number of employees in SMEs can be up to 2000 people in some industries; even for small firms, many industries allow more than 250 employees, which is far greater than that of the EC’s criteria.

Table 2-5: Definition of SMEs in China 2003

Size Category	Industries	Employment-based	Total assets in £	Business revenue in £
Small	Industry	<300	<£ 4.25 Million (M)	<£ 3.19M
	Construction	<600	<£ 4.25M	<£ 3.19M
	Wholesale	<100		<£ 3.19M
	Retail	<100		<£ 1.06M
	Transport	<500		<£ 3.19M
	Post	<400		<£ 3.19M
	Hotel & Restaurant	<400		<£ 3.19M
Medium	Industry	300-2000	£ 4.25M-42.50M	£ 3.19M-31.90M
	Construction	600-3000	£ 4.25M-42.50M	£ 3.19M-31.90M
	Wholesale	100-200		£ 3.19M-31.90M
	Retail	100-500		£ 1.06M-15.96M
	Transport	500-3000		£ 3.19M-31.90M

Post	400-1000	£ 3.19M-31.90M
Hotel & Restaurant	400-800	£ 3.19M-15.96M

Note: SMEs meet one or more of the conditions. ME should meet three conditions, the others are SE.

Source: Adapted from SME Promotion Law of China, 2003

Table 2-6: Definition of SMEs in China 2011

Size Category	Industries	Employment-based	Total assets	Business revenue (£)	
Medium	Agriculture/Fishery/Animal husbandry/Forestry			£0.53-21.28M	
	Industry	300-1000		£2.13-42.50M	
	Construction		£5.31-85.11M	£6.38-85.11M	
	Wholesale	20-200		£5.31-42.50M	
	Retail	50-300		£0.53-21.28M	
	Transport	300-1000		£3.19-31.90M	
	Warehousing	100-200		£1.06-31.90M	
	Post	300-1000		£2.13-31.90M	
	Hotel & Restaurant	100-300		£2.13-10.60M	
	Information transmission	100-2000		£1.06-10.6M	
	Software and information service industry	100-300		£1.06-10.6M	
	Real estate development and management			£5.31-10.60M	£1.06-212.77M
	Property management	300-1000		£1.06-5.31M	
	Leasing and business service	100-300		£8.51-127.66M	
Others	100-300				
Small	Agriculture/Fishery/Animal husbandry/Forestry			£0.05-0.53M	
	Industry	20-300		£0.32-2.13M	
	Construction		£0.32-5.31M	£0.32-6.38M	
	Wholesale	5-20		£1.06-5.31M	
	Retail	10-50		£0.11-0.53M	
	Transport	20-300		£0.21-3.19M	
	Warehousing	20-100		£0.11-1.06M	
	Post	20-300		£0.11-2.13M	
	Hotel & Restaurant	10-100		£0.11-2.13M	
	Information transmission	10-100		£0.11-1.06M	
	Software and information service industry	10-100		£0.05-1.06M	

	Real estate development and management		£2.13-5.31M	£0.11-1.06M
	Property management	100-300		£0.53-1.06M
	Leasing and business service	10-100	£0.11-8.51M	
	Others	10-100		
Micro	Agriculture/Fishery/Animal husbandry/Forestry			<£0.05M
	Industry	<20		<£0.32M
	Construction		<£0.32M	<£0.32M
	Wholesale	<5		<£1.06M
	Retail	<10		<£0.11M
	Transport	<20		<£0.21M
	Warehousing	<20		<£0.11M
	Post	<20		<£0.11M
	Hotel & Restaurant	<10		<£0.11M
	Information transmission	<10		<£0.11M
	Software and information service industry	<10		<£0.05M
	Real estate development and management		<£2.13M	<£0.11M
	Property management	<100		<£0.53M
	Leasing and business service	<10	<£0.11M	
	Others	<10		

Note: Others include The Scientific Research and Technical Services, Fishery and Water Conservancy; Environment and Public Facilities Management; Residents Service, Repair and Other Services; Culture, Sports and Entertainment.

Source: Adapted from the Ministry of Industry and Enterprise [2011]

Chen and Karami (2010) argue that the difference between Chinese and Western criteria brings a challenge that will limit generalisation of research results. However, it should be noted that around 70% of SMEs have fewer than or equal to five employees or are run by self-employed individuals, which means the overall SME environment is not greatly different between Chinese and Western economies. Moreover, this research focuses on high-tech SMEs that originally have smaller employment size compared with non-tech SMEs. The highlighted rows in Table 2-6 represent some of the technology industries, including information transmission, software and information service industry, and others (as shown in the note). It can be found that, apart from the information transmission industry, the employment base in other industries is fewer than 300 people, which is not much different from the criteria in other countries. Both of reasons can lessen the limitation of generalisation.

2.2.3 Why SMEs are Important

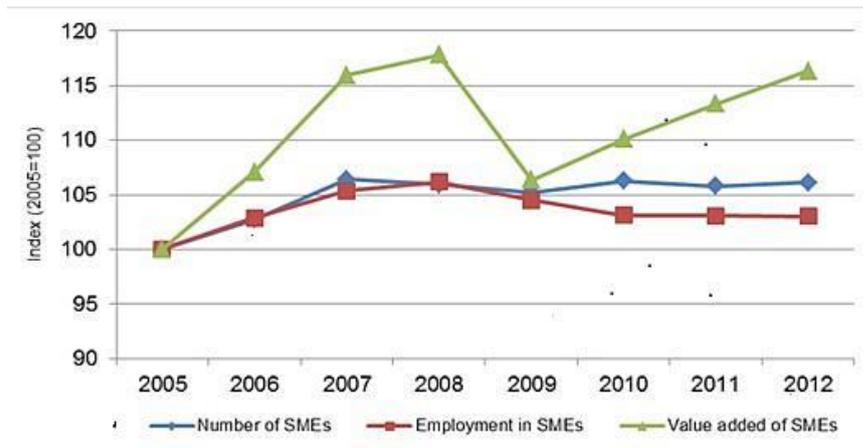
The potential of job creation and economic growth of SMEs had been neglected for a long time and most scholars had exaggerated the mechanisms of large firms (Wilkinson, 1999). However, recent studies have been launched more towards the benefits brought from SMEs. Increasing attention has been paid to SMEs and they are now considered as the main component of the global stock of firms. It is suggested that SMEs have become the major contributors to new job creation, innovation, productivity, utility and economic growth in both developing (Kongolo, 2010) and developed economies (Van Praag and Versloot, 2008), and have thus attracted increasing attentions from scholars and policy makers.

The most frequently mentioned benefit brought by SMEs is job creation. Typically, SMEs account for over 99% of all businesses and generate over 50% of all jobs (Bacon and Hoque, 2005). For example, Ayyagari, Demirgüç-Kunt, and Maksimovic (2011) suggested that SMEs generate jobs and new patterns of work. Relative to their size, small and young firms created more job opportunities than their counterparts (Henrekson and Johansson, 2010; Van Praag and Versloot, 2008). As mentioned in the introduction chapter, SMEs provided about 75 million jobs, and 66% of total employment in the EU, according to the statistical data in 2005. Moreover, it should be noted that 93.2% of SMEs in the EU were small firms that employed fewer than 10 employees (Lukács, 2005). Surprisingly, the employment rate increased in the SME sector while large firms lost jobs between 1988 and 2001. During an economic recession period, the employment drop rate of SMEs is slightly less than that of large firms (Varum and Rocha, 2013).

It should be highlighted that only when considering both small and medium sized enterprises is the contribution on employment comparable with large firms (Ayyagari et al., 2011); only small firms contribute the smallest part across the nation. However, small firms still play a significant role in employment creation because they create most of the new jobs. Schreyer (1996) highlighted that, in certain countries, the net employment growth is generated by very small firms, whereas small to medium-sized firms do not perform much better than large firms. Specifically, Henrekson and Johansson (2010) emphasised that a small number of high-growth firms generate net employment growth, and most of these firms are younger than other firms. In other words, relative to their size, SMEs could create more job opportunities than their counterparts (Henrekson and Johansson,

2010; Van Praag and Versloot, 2008). Figure 2-1 shows the changes in the number of SMEs, employment in SMEs and value added of SMEs in Europe since 2005. The number of SMEs and employment in SMEs had not significantly changed, but it showed a big jump in terms of value added of SMEs since 2005, except for 2009 when the world economic crisis happened (Dimitri Gagliardi and Brtkova, 2013).

Figure 2-1: Number of SMEs, Employment in SMEs and Value Added of SMEs in Europe (2005=100)



Source: Annual Report on European SMEs (Dimitri Gagliardi and Brtkova, 2013)

Another highlighted benefit emphasised by many scholars was that small firms are the engines of innovation in regards to technology, products and process (Acs and Audretsch, 1988), and, thus, improved overall productivity (Hall et al., 2009). The empirical studies showed that almost half of the number of innovation activities were contributed by smaller firms that had fewer than 500 employees (Acs and Audretsch, 1988). For instance, Baranano et al. (2005) studied the innovation abilities of SMEs and found that smaller firms contributed larger numbers of patents and innovations compared to their size. They suggested that the innovation-per-employee ratio of SMEs was five times larger than that of large firms. Moreover, high innovation rate also highly reflects firms' labour productivity, as it improves the work efficiency. In other words, to some extent, larger and older firms seem to be, *ceteris paribus*, less productive (Hall et al., 2009).

Furthermore, SMEs are also important, as they contribute high overall share of GDP (Huggins and Williams, 2009; Jones and Tilley, 2007). Although it is difficult to estimate SMEs' contribution to GDP, it is generally believed that the contribution is between 30% and 60% of GDP (Harvie and Lee, 2002). Thus,

SMEs have positive influence on economic growth (Van Praag and Versloot, 2008).

Finally, the SME potential to advance social development has also been mentioned by some scholars (Parrilli, 2007; Schmitz and Musyck, 1994). Specifically, under certain conditions, such as a stable economic and employment growth, there is positive relationship between development of SMEs and their local production systems, economic democracy and collective welfare (Parrilli, 2007). Under certain circumstance, SMEs exhibit the potential of advanced economic democracy. Some studies on developed countries, such as Italian industrial districts, Baden-Wuttenberg in Germany, southwest Flanders in Belgium, and southeast Jutland in Denmark, had proven these views (Schmitz and Musyck, 1994).

In summary, SMEs increase competition and entrepreneurship and, hence, have positive effects on innovation, economy-wide efficiency, economic growth and productivity (Beck, Demirguc-Kunt & Levine, 2005). In addition, SME expansion boosts employment, as SMEs are more labour intensive (Lukács, 2005). Finally, the benefits brought by SMEs to the economic democracy cannot be ignored. These benefits have inspired government intervention within the field of entrepreneurship (Huggins and Williams, 2009).

2.3 Innovation and Entrepreneurship

The previous section had emphasised the superior innovation capability of SMEs. Innovation has been viewed as an integral part of entrepreneurship (Drucker, 1985). Thus, this section will identify what innovation and entrepreneurship are. Furthermore, the characteristics of the potential high innovative enterprises, technology-based firms, will be examined.

2.3.1 Concept of Innovation

Bessant et al. (2005: 1366) emphasised the renewal and growth role of innovation in that “innovation represents the core renewal process in any organisation. Unless it changes what it offers the world and the way in which it creates and delivers those offerings it risks its survival and growth prospects. “

Many empirical researches in the past had examined the innovative activities of relatively large firms, and little attention was focused on small firms (Acs and

Audretsch, 1988). Thus, most effect factors of innovative activities were based upon observing larger firms' behaviour. However, Acs and Audretsch (1988) argued that small firms are the engines of innovations, in terms of technology, products and process. More than half of innovations are contributed by SMEs that have less than 500 employees. Thus, the inferences that come from the observations on larger firms' behaviours may be misleading.

When talking about innovative activities, the most frequently used terms are "R&D" or "scientific research". However, innovative activities include a much wider definition than R&D. Innovation is to develop and/or adopt new products and processes, to incrementally improve products and processes, and new ways of marketing and/or new distribution modes (Porter, 1993). Therefore, there are different types of innovation, including product innovation, process innovation, or other aspects of the activities of a firm that lead to increased "value" (Oslo, 2005). The "value" here can be defined as value added for the firm and/or benefits to consumers or other firms.

Many literatures have suggested that innovation activities positively affect internationalisation and competitiveness. All types of innovation in relation to products, services, operations and processes play significant roles in maintaining competencies and responding to the change of worldwide environmental restrictions (Baregheh, Rowley & Sambrook, 2009). For example, Zahra and Covin (1994) highlighted the positive relationship between internationalisation and innovation capabilities. Moreover, from Porter's (1993) interpretation of innovation, he argued that innovation positively influences competitiveness.

Innovation is generated from a wide range of changes, such as changes of organisation's resources, strategies, requirements and capabilities. Innovative ideas arise from surplus of internal and external sources. The degree of innovation could vary with the firm's industry, previous knowledge and the degree of concentration on the external environment (Baranano et al., 2005). The users, suppliers, manufacturers and other elements can be the sources of innovation, which varies widely due to their different natures. Table 2-7 shows the internal and external sources of innovation. Users, suppliers, consultants and an interaction with technical departments of other firms are generally considered as the external sources of innovation. In addition, universities and research

institutions were also cited as external sources by Chrisman and Katrishen (1995). Firms who make greater use of external sources develop faster and have more successful innovation compares to others (Baranano et al., 2005).

Table 2-7: Sources of Innovation

Internal sources	External sources
Co-workers	Users or customers
Internal R&D	Competitors
Marketing group	Cooperation with other companies
Top management	Suppliers
Manufacturing	University or research institutions
	Consultants
	Acquisition of new equipment
	Professional journals
	Internet

Source: (Baranano et al., 2005)

2.3.2 Definitions of Entrepreneurship

Defining entrepreneurship has occupied scholars for a long time and there is still a lack of consensus on its exact meaning (Baughn and Neupert, 2003). The French economist, Cantillon, is generally accredited as the first person to coin the phrase in the context of the term entrepreneurship around 1730. He defined entrepreneurship as self-employment of any sort, and the entrepreneurs as risk-takers who buy at a certain price in the present and sell at uncertain prices in the future (Outcalt, 2000). Many economists and scholars, including Knight (1921), built the definition on the contribution of Cantillon and defined entrepreneurs as those people who attempt to predict and act upon change within markets. It should be noted that, in both schools, the key tenets are risk taking and profit making, which were not changed until the definition from Schumpeter. Innovation entered the mainstream, through Schumpeter, and entrepreneurship, therefore, equates with innovation in the business sense (Schumpeter, 1934). The entrepreneurs here are not necessarily being the risk takers. Table 2-8 presents different interpretations of entrepreneurship and entrepreneurs.

Table 2-8: Definitions of Entrepreneurship and Entrepreneurs

Year	Main Contributors	Definition	Sources
1730	Richard Cantillon	Entrepreneurship as self-employment of any sort, and entrepreneurs as risk-taker; entrepreneurs buy at	(Outcalt, 2000)

		certain prices in the present and sell at uncertain prices in the future	
1921	Frank Knight	Builds on the contribution of Cantillon, entrepreneurs attempt to predict and act upon change within markets.	(Knight, 1921)
1934	Joseph Schumpeter	Entrepreneurs as innovators who implement entrepreneurial change within markets. Exploit opportunities and using innovative approaches to exploit them.	(Schumpeter, 1934)
1973	Israel Kirzner	The entrepreneur recognises and acts upon profit opportunities, essentially an arbitrageur	(Kirzner, 1973)
1985	Peter Drucker	Entrepreneurs who create a new organisation and start a new business venture; even fail to make profit	(Drucker, 1985)

As presented, the definition of entrepreneurship still has a lack of consensus. Shane (2003) studied the previous research and identified the problems existing in the area. The most significant part of the problem is that scholars try to divide the field into two camps: one is focused on the individual behaviours and the other on external forces. Neoclassical theory highlights the importance of opportunities and assumes that everyone can recognise entrepreneurial opportunities, while psychological theory emphasises on the importance of people's attributes and the entrepreneurship process depends on people's abilities and willingness (Shane, 2000). The most modern theory is the Austrian business cycle theory that argues that entrepreneurship comes from the interactions between external sources (opportunities) and internal sources (attributes of people). It is believed that opportunities cannot all be recognised by all people (Shane, 2000). The Austrian theory neither considers the opportunity discovery process as mechanical, nor does it suggest that people with specific attributes are more likely to discover opportunities. The Austrian theory considers opportunity exploitation as endogenous to opportunity discovery.

Venkataraman (1997) mentioned that many scholars have tried to define entrepreneurship in terms of the entrepreneur or the activities and behaviours of entrepreneurs. However, it might be impossible to form a consensus on a definition because the two concepts have fundamentally different interpretations. Shane and Venkataraman defined entrepreneurship as:

Entrepreneurship is an activity that involves the discovery, evaluation and exploitation of opportunities to introduce new goods and services, ways of

organising, markets, processes, and raw materials through organising efforts that previously had not existed (Shane and Venkataraman, 2000; Venkataraman, 1997)

It can be found that the definition currently mainly focuses on the innovative activities and discovering opportunities. In this thesis, the author, based on the previous researches, takes the definition of entrepreneurship as:

Entrepreneurship is a process of discovering and exploiting opportunities to introduce new goods and services, which involves internal influential factors (personal attributes, e.g. risk bearing) and external influential factors (e.g. political), and finally towards profit in the markets.

Author: based on previous researches

It can be seen that entrepreneurship here is considered as the process of entrepreneurial activities that involve human action and profit pursuit. The work from the OECD group (2008) also provided similar definitions of entrepreneurship and entrepreneurial activity. The entrepreneurship is considered as “the phenomena associated with entrepreneurial activity” (Ahmad and Seymour, 2008:9).

Discovering and exploiting opportunities can be seen as the fundamental process of entrepreneurial activities. To date, there exist two different explanations for entrepreneurial opportunities, namely, the Kirznerian (1973) perspective and the Schumpeterian (1934) one. They are associated with two alternative theories of entrepreneurial actions, which are the discovery theory and the creation theory, respectively (Alvarez and Barney, 2007). The discovery theory finds its intellectual roots in Kirzner (1973). The central assumption of discovery theory is that opportunities exist as objective phenomena. Kirzner (1973) argued that the opportunities exist when people get different access to existing information; as decision-making is not always accurate, thus it generates shortages and surpluses. People can discover and make use of opportunities by responding to these shortages and surpluses and make profit. Those opportunities are available to all, but perceived by only a few. Differential entrepreneurial alertness is central to the discovery theory of entrepreneurship (Kirzner, 1973). In contrast, Schumpeter (1934) argued that new information is an important source to the existence of entrepreneurial opportunities. Opportunities do not exist objectively and they need to be explored by individuals. Thus, this type of entrepreneurial

action has been labelled by Gartner (1985) as the Creation Theory. There exist high levels of uncertainty and the searching of opportunities occurs over time (Alvarez and Barney, 2007).

Changes in economic factors, political forces, technology and social trends generate new information. Entrepreneurs discover this information and identify how to recombine resources into more valuable forms. Table 2-9 shows the differences between Schumpeterian opportunities and Kirznerian opportunities. It can be found that the two theories are based on contradictory assumptions.

Table 2-9: Schumpeterian Opportunities and Kirznerian Opportunities

Schumpeterian opportunities	Kirznerian opportunities
Disequilibrating	Equilibrating
Requires new information	Does not require new information
Very innovative	Less innovative
Rare	Common
Involves creation	Limited to discovery

Source: (Shane, 2003)

2.3.2.1 External Influential Factors of Entrepreneurship

Bhide (2000) interviewed about half of the founders of Inc. 500 firms and indicated that they started their businesses in answer to a specific change in external factors, such as technology, regulations and fashion. His study suggested that entrepreneurship has a strong connection with specific categories of sources of opportunity. Some researches link entrepreneurship with social, cultural and political contextual factors (Reynolds, Camp, Bygrave, Autio & Hay, 2002), while some also added economic factors to the culture model of entrepreneurship (Lee and Peterson, 2000).

In this section, three main environmental changes associated with entrepreneurial activities will be discussed, including technological changes, political and regulatory changes, and social and demographic changes.

Technology Changes

Casson (1995) mentioned that technology changes are an important source of entrepreneurial opportunities, because the changes allow people more possibilities to allocate resources in potentially more productive ways. Shane

(2003) argued that it is not a direct way to measure the existence of opportunities, and proxy measures should be used when measuring the effects of technology changes. Most commonly used proxy measures are the inclination of people engaged in self-employment and the inclination to found firms. Blau (1987) studied the self-employment rate in the US and found that there were positive relationships between technological changes and self-employment rate over a two-decade period. Shane (1996) also provided similar empirical study results that the annual number of new patents issued which were highly associated with technological changes had a positive effect on the number of organisations per capita in the economy in the subsequent year.

Political/Regulatory Changes

Political and regulatory changes make it possible to reappportion resources to new uses in different ways, as well as allowing more productive ways to recombine resources (Shane, 2003). For example, Holmes and Schmitz Jr. (2001) mentioned that some regulations block potential entrants and lead to unproductive competition rather than productive efforts to innovate. Thus, the change of regulation and deregulation may increase the productive competition in the market and generate more opportunities. However, the political/regulatory changes increasing the rate of initiating businesses does not mean it increases the survival rate and performance of firms. Some empirical studies show that firms founded in that period performed worse than firms founded in other periods as it lowers the entrance barrier, which attracts many unqualified entrepreneurs.

Social-demographic Changes

Social-demographic changes generate some additional demands and also, in some cases, create potential economic scale (Shane, 2003). The social-demographic changes include three categories, urbanisation, population dynamics and educational infrastructure. Take education infrastructure as an example. The change of educational infrastructure will result in the creation of new knowledge, which is the sources of entrepreneurial opportunities. Also, the educational institutions can be treated as the mechanisms to distribute knowledge and, thus, generate more opportunities (Aldrich and Wiedenmayer, 1993).

2.3.2.2 Internal Influential Factors of Entrepreneurship

The literature suggested that there is relationship between personality traits and business creation (Rauch and Frese, 2007). There are several entrepreneurial models to explain the central characteristics of entrepreneurs, including “great person” school, psychological characteristics school, classical school, management school, leadership school and intrapreneurship school (Cunningham and Lischeron, 1991). They explain the behaviours and skills from different aspects and different enterprises’ growth stages.

As introduced by the psychological characteristics school of entrepreneurship (Cunningham and Lischeron, 1991), risk taking is the key factor in distinguishing entrepreneurs and managers (Mill, 1848), which has been used as the definition of entrepreneurship in three recent dictionaries (Babcock Gove, 1976; Funk and Wagnalls, 1968; Stein, 1989). However, it is different from gambling in that entrepreneurs have some degree of skill to understand and estimate the profit, in other words, they will avoid extreme risks, but are also not afraid of uncertainty (McClelland and Winter, 1969).

Leadership and need for achievement is mentioned by both the psychological characteristics school and leadership school. The psychological characteristics school, based on the theory of capitalism, concluded that Protestant values encourage the need for achievement, as a person’s value is judged by their achievement (McClelland, 1967; McClelland and Winter, 1969). The leadership school of entrepreneurship suggests that a successful entrepreneur must also be a “people manager” who plays a vital role in motivating, directing and leading people (Kao, 1989).

The “great person” school of entrepreneurship suggests that successful entrepreneurs normally have high levels of vigour, energy and confidence in their own abilities. This thought believes that some people are endowed with certain traits and are more likely to become a successful entrepreneur than others (Garfield, 1987; Roscoe, 1973).

It is hard to say which attributes are the most important ones for entrepreneurship. Shane (2003) mentioned that the two reasons that some people are more likely to discover opportunities are: first, those people have better access to information about the existence of the opportunities; and second, those people are more able to recognise opportunities than others and have superior cognitive capabilities.

Access to Information

It is argued that some people can get more opportunities because they are more able to access information that other people lack (Hayek, 1945; Kirzner, 1973). The people with information can recognise the opportunities when other people simply ignore their existence. The information could be about the local demand or underutilised resources (Casson, 1982). People can get the information through their specific life experience, such as their daily life, jobs (Venkataraman, 1997), social network structure, and information search (Casson, 1982).

Opportunity Recognition

Two factors affect the ability to recognise opportunities in information, they are absorptive capacity and cognitive processes.

The absorptive capacity facilitates the acquisition of additional information, such as technologies, product processes and markets, which derives from people's prior knowledge. The prior knowledge provides individuals and firms with the abilities to recognise the value of new information, absorb it and commercialise it (Cohen and Levinthal, 1990).

The cognitive processes also are known as "alertness to opportunity" (Kirzner, 1997). Gaglio and Katz (2001) mentioned how cognitive processes influence people's abilities to recognise opportunities. Some people are more likely to recognise opportunities because they have a better understanding of causal links, observe relationships and patterns in information, and evaluate the value and the degree of accurate information than other people.

2.3.3 Definitions of Technology-based SMEs

As highlighted in the introduction chapter, the ability to exploit technology innovation can promote the long-term economic performance of nations, firms and industries (Cohen, 2010). High innovation rates also reflect a firm's labour productivity as they improve the work efficiency (Hall et al., 2009). Thus, it is suggested that high levels of innovation, R&D and productivity are positively related (Andersson, Johansson, Karlsson & Lööf, 2012; Cohen and Klepper, 1992).

Identifying high-growth firms can help policy makers more efficiently implement supportive policies due to limited government resources (Coad et al., 2014), and,

thus, achieve overall economic growth. Storey (1994) argued that a small proportion of SMEs generated huge amounts of innovation and growth, which made the distribution of SMEs' performance highly skewed. Current research suggests that high innovative firms and high growth firms do not overlap to a significant degree (Coad et al., 2014). However, in the high-tech sector, innovation is of crucial importance for fast-growth firms (Coad and Rao, 2008). The author chose technology-based SMEs as the study object because they exhibit most of the characteristics of the three terms, "SMEs", "Innovation" and "Entrepreneurship". In addition, the levels of technological innovation can reflect the level of a firm's growth. From the policy perspective, identifying high innovative technology-based SMEs is identifying high-growth SMEs. It should be less challenge for policy makers to select supporting targets.

The definition of the high-tech sector is still indistinct, so, this thesis will apply a definition of technology sectors provided by Butchart (1987), which was mainly based on the R&D expenditure or R&D workers. Specifically, Butchart (1987), based on the "ratio of R&D expenditures to sales" and "share of employees working in R&D", defined what are high-tech manufacturing sectors in the UK, see Table 2-10. The reasons to apply his definition were: 1) there is no standard definition of technology-based firms; and (2) according to the further information from document collection in China, this definition has the most in common with that in China.

Table 2-10: Definition of High-tech Sectors

Aggregated industries used	Short description according to NACR Rev. 1
R&D-Intensive Service Industries	Telecommunication. Computer Programming and Software Services, Data processing, Misc. Computer Services, R&D in Natural Sciences and Engineering
ICT-Hardware	Office Equipment; Computers and other Information Processing Equipment; Television and Radio Transmitters and Apparatus for Line Telephony and Line Telegraphy; Television and Radio Receivers, Sound or Video Recording and Reproducing Apparatus
Engineering Industries	Electronic instruments and Appliances for measuring, Checking (except industrial process control); Electronic Industrial Process Control Equipment; Optical Instruments; Photographic Equipment

Health and Life Sciences	Pharmaceutical Products and Preparations; Medical and Surgical Equipment and Orthopaedic Appliances
Other High-tech Manufacturing	Plastics and Synthetic Rubber in Primary Form; Electric Motors, Generators and Transformers; Electricity Distribution and Control Apparatus; Electronic Valves, Tubes and other Components; Aircraft and Spacecraft Manufacturing

Source: (Butchart, 1987)

Butchart (1987) identified the sectors with “higher than average expenditures on R&D of the proportion to sales” or with “more qualified scientists and engineers” than other sectors as high-tech sectors. Btirgel, Fier, Licht, and Murray (2004) also described that the high-tech sector is one with high expenditure on R&D, short technology and product life cycles, and strong foreign competition. Thus, in this thesis, the technology-based SMEs should belong to the sectors mentioned in Table 2-10, but, at the same time, match the standard of the SMEs exhibited in the previous section.

2.3.4 Definitions of Technology-based SMEs in China

In 2008, the Ministry of Science and Technology, Ministry of Finance and State Administration of Taxation jointly issued a document called “*the Administrative Measures for Determination of High and New Tech Enterprises*” (MOST, 2008). In this document, it set the criteria of the technology industries, the range of high and new tech fields, and certification process.

The following conditions should be simultaneously satisfied for an enterprise to be determined as a high and new tech enterprise:

The enterprise was registered within the territory of China (excluding Hong Kong, Macao and Taiwan regions) and has independent intellectual property of the core technologies in its key products (services) by way of independent research and development, acceptance of transfer, donation or merger during the past three years or by way of exclusive licensing for five years or longer;

The products (services) are within the range as prescribed in the high and new tech fields under the key support of the state;

The scientific and technical personnel with an educational background of junior college or higher account for at least 30% of the total number of employees of the

enterprise, of whom the research and development personnel account for at least 10% of the total number of employees of the enterprise;

The enterprise has been incessantly carrying out research and development activities for the purpose of acquiring new science and technology (excluding human culture and social science) knowledge, for innovatively employing the new knowledge of science and technology or substantially improving the technologies or products (services), and the proportion between its total research and development expenditure during the past three accounting years and its total sales revenue meets the following requirements:

- a) If the sales revenue of the enterprise during the latest year is less than 50 million Yuan (£5,319,148), the proportion shall not be lower than 6%;
- b) If the sales revenue of the enterprise during the latest year is 50-200 million Yuan, the proportion shall not be less than 4%;
- c) If the sales revenue of the enterprise during the latest year is more than 200 million Yuan, the proportion shall not be less than 3%.

If the proportion between the total research and development expenditure incurred within China and the total research and development expenditure is less than 60% and three years have not lapsed since the registration of the enterprise, the calculation shall be based on the actual number of years of business operation of the enterprise;

The enterprise's revenue from high and new tech products (services) accounts for at least 60% of its total revenue during the current year;

The enterprise's level of organisation and management of research and development, capacity of transformation of scientific and technological achievements, number of independent intellectual property rights, growth in sales and total assets as well as other indicators meet the requirements in the Guidelines on the Administration of Determination of High and New Tech Enterprises.

The enterprises shall conduct businesses in a qualified high and new tech sector, such as aviation and aerospace, biological and medical, electronic information, new-energy and energy conservation, new-materials, high-tech services, or resources and environmental technology, as well as high and new technologies that transform traditional sectors.

2.3.5 Innovation in Small Firms

Section 2.3.1 introduced the definition of innovation and the positive influences of innovation on internationalisation and competitiveness. However, it is still not clear why and how small firms innovate. This section aims to provide an understanding of innovation in small firms; why and how small firms innovate will be studied in the following sections.

2.3.5.1 Why Do Small Firms Innovate?

Innovation can be seen as the key factor of productivity (Solow, 1997), as well as an important motivator to position a company in an increasingly internationalised economy (Fruin and Kaisha, 1997; Svelby, 1997). When considering innovation, the priorities are the change of knowledge and preferences (Nooteboom, 1988). Traditional economic categories, as well as cognitive and social dimensions, should be considered as relevant characteristics. Since the future is essentially unpredictable, it requires firms to have more creative initiatives from employees to adapt to a rapidly changing environment and, thus create, the desired future (Thurow, 1996). Quinn, Anderson, and Finkelstein (2005) argued that, in today's economy, the employees will shift from those who have a traditional and practical training background to those who have a higher education or are theoretically better equipped. It has been highlighted that the challenge of the 21st century is the productivity of the service and knowledgeable workers (Drucker, 1993), as well as strategic flexibility and innovation. Competitive process eliminates opportunity, whereas the change of the state of knowledge generates new opportunities. As mentioned by Jacobson (1992), new disequilibrium situations happen when there are continuous changes in the stream of knowledge, which, therefore, generates new profit opportunities. Some firms have a better position to innovate as they have more information and, thus, can more likely turn the information to knowledge by ascertaining market inefficiencies (Johannessen, Olsen & Olaisen, 1999).

There is growing awareness that there is a strong link between productivity, quality and competitiveness and the learning and innovation abilities of organisations (Sveiby, 1997; Thurow, 1996), because the most important source to sustain competitive advantage is knowledge. In this sense, the knowledge-workers, who are the main producers of knowledge, play the main role in organisational innovation. For the organisations, the knowledge-workers

create both extraordinary opportunities and challenges, especially workers in management (Drucker, 1993). The managers' abilities will eliminate the barriers the organisations will meet and create a relatively good environment or context for the organisations to keep individuals in the group performing to their best (Sveiby, 1997; Thurow, 1996). Moreover, the innovation capabilities of smaller firms improve their abilities to transform process and product innovations into business activities and, thus, generate superior business performance.

In short, innovation might not drive a firm to grow significantly, but it may improve their competitiveness and productivity. Thus, small firms have the motivation to improve their innovative abilities.

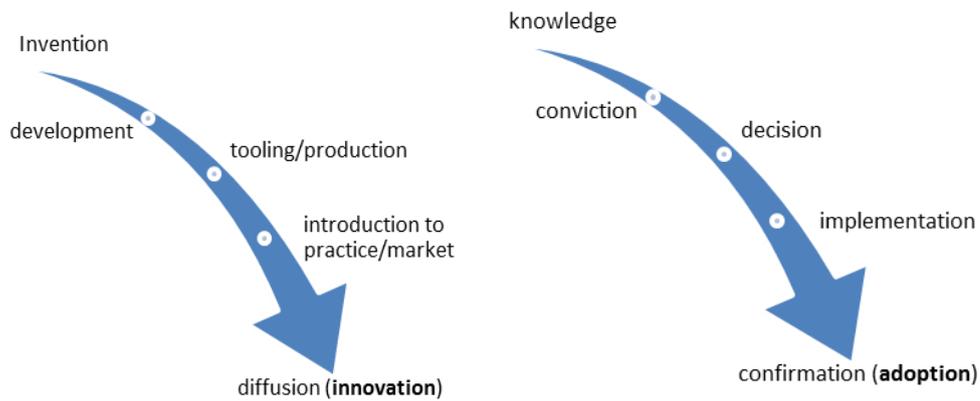
2.3.5.2 How Do Small Firms Innovate?

There is positive relationship between firm size and innovation abilities. However, innovation productivity declines with size (Lewin and Massini, 2003). This is because innovation activities are more likely to be hindered in larger firms by bureaucratisation, while smaller firms are less bureaucratic, more flexible and have a more innovative-friendly atmosphere (Lewin and Massini, 2003).

Smaller firms play a limited role in major scientific and technological breakthrough (Nooteboom, 1994). However, they can take advantage and make good use of major inventions which they did not personally contribute. Instead, application, improvement, differentiation, implementation and adaption are the main strategies to innovate in small firms (Dosi, 1988; Winter and Nelson, 1982).

Figure 2-2 shows the stages of innovation and adoption. The stage of innovation is roughly based on Schumpeter's view, the Creation Theory, and mostly meets the innovation process of larger firms. The stage of adoption is more a general sequence in the real economic world. It matches the Austrian type of entrepreneurship, which is more radical innovation in terms of full utilisation, instead of incremental innovation of a combination of technology, products and markets (Nooteboom and Groningen, 1993).

Figure 2-2: Stages of Innovation and Adoption



Source: adapted from Nootboom (1994)

According to Rogers (1983), the diffusion of innovations is a process by which an innovation is communicated through certain channels over time among the participants in a social system. In this sense, the stage of innovation should be considered as the first stage of innovation diffusion by which the knowledge is created. Then, other firms, in the stage of adoption, evaluate and study the knowledge that has already been created and implemented to have new products or processes, which can be seen as the latter stage of innovation diffusion.

Based on Diffusion of Innovation Theory, there are five stages by which a person adopts an innovation and whereby diffusion is accomplished. Table 2-11 presents the associations between innovation processes and adopter categories.

Table 2-11: Innovation Processes and Adopter Categories

Nootboom (1994) Innovation Processes	Rogers (1983) Adopter Categories	Types of Adopters
Stage of Innovation	Innovator	The first to try the innovation: High Risk Takers
Stage of Adoption	Early Adopter	Opinion leaders: comfortable adopting new ideas
Stage of Adoption	Early Majority	Rarely leaders, but they do adopt new ideas before the average person
Stage of Adoption	Late Majority	Only adopts a new idea when it has been tried by the majority, and when evidence of the innovations is effective

Stage of Adoption	Laggards	Bound by tradition and very conservative
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Source: Adapted from Nootboom (1994) and Rogers (1983)

The diversity of firms needs both conditions and sources. Diversity conditions are the degree of discipline that allows the managers or entrepreneurs to pursue to what extent the standards of profit or conduct (Nootboom, 1994). As, for most small firms, their capital come from private sources, or from the bank, it allows them have more variance in terms of the demands on profit. They have a more positive view of opportunities and capabilities. When the capital mainly comes from family and friends, most entrepreneurs will be willing to face more risk for emotional reasons. In addition, government regulations -labour conditions, liability, technical and safety standards, zoning laws, environment and other regulations for location and buildings - are other diversity conditions because, they are either more lenient on smaller firms or it is too costly to closely monitor and discipline the small firms (Nootboom, 1994). The sources of diversity consist of the variance of motives, goals and background of entrepreneurship. The sources can be grouped into three, “pull” factors, “push” factors and coincidence. Discontent with present position pushes firms to innovate. The refuge hypothesis refers that people refuge entrepreneurship because of lack of employment, lack of qualifications for available jobs, or scarcity of employment opportunities (Nootboom, 1994). According to the refuge hypothesis, there is a relation between social security and entrepreneurship. The poorer countries have more need to develop entrepreneurship. The importance of the “pull” factor is that small firms are more independent than large firms. Relatively unstructured procedures and relations, and orientation towards personal values and relations are the result of the independence and personality of small firms (Nootboom, 1994). Moreover, coincidence can be seen as both a push and pull factor. For example, the “role model” who is a successful entrepreneur in one’s life and the personal crisis can be the triggers of entrepreneurship (Nootboom, 1994). To sum up, small firms have both sources and conditions that generate a big diversity. However, only minorities can perform radical innovation, while most small firms tend to adopt and develop existing knowledge.

In summary, the internationalised economy requires small firms to innovate due to increasing competition. The knowledge-workers play increasingly important

roles in promoting innovation, especially workers in management. Meanwhile, information is another important element for innovation as it provides the opportunities to transfer the information into knowledge and, thus, generate innovation. The financial sources and government regulations also affect the levels of innovation. Finally, the pull factor, such as the scarcity of job opportunities, push factor, the characteristics of small firms, and some coincidence factors, do, to some extent, affect firms' innovation level.

2.3.6 Science Parks

In most countries, such as the UK, the US and Sweden, a science park is considered as a geographic region that provides accommodation, facilities (Eul, 1985) and resources for commercialising technology achievements (Bergek and Norrman, 2008; Westhead and Batstone, 1998).

The Association of University Related Research Parks (Link and Siegel, 2007:141) defines a science park as “a property-based venture” which has:

1. Existing or planned land and buildings designed for private and public research and development facilities, technology and science based companies relating to support services;
2. A contractual and/or operational relationship with a university or other institution of higher education;
3. A role in promoting research and development by the university in partnership with industry, assisting in the growth of new ventures, and promoting economic development;
4. A role in aiding the transfer of technology and business skills between the university and industry tenants.

Other associations, such as the International Association of Science Parks and the United Kingdom Science Park Association, have adopted a similar definition.

Three main classes of science park objectives have been reviewed: (a) economic development, (b) transfer-of-technology, and (c) local benefit (Link and Scott, 2006; Massey, Quintas & Wield, 1992).

Table 2-12: Science Park Objectives

Economic Development
1. Stimulate the formation of start-up new-technology-based firms (NTBFs)

<ol style="list-style-type: none"> 2. Encourage the growth of existing NTBFs 3. Commercialise academic research 4. Foster the technologies of the future 5. Counter the regional imbalance of R&D capability, investment and innovation 6. Attract inward investment, mobile R&D
Transfer of Technology
<ol style="list-style-type: none"> 1. Encourage spin-offs started by academics 2. Encourage and facilitate links between higher education institutes and industry 3. Facilitate technology transfer from academic institution to firms on-park 4. Increase the 'relevance' of the research of higher education institutes to industry 5. Give academic institutions access to leading-edge commercial R&D 6. Increase the appreciation of industry's needs by academics 7. Stimulate science-based technological innovation
Local Benefits
<ol style="list-style-type: none"> 1. Create employment and consultancy opportunities for academic staff and students 2. Create synergy between firms 3. Create new jobs for the region 4. Improve the performance of the local economy 5. Stimulate a shift in perceptions 6. Build confidence 7. Engender an entrepreneurial culture 8. Generate income for academic institutions 9. Improve the image of academic institutions in the eyes of central government

Source: (Massey et al, 1992: 21)

It can be seen that the objectives of a science park meet the objectives of policy makers, in terms of economic growth, technology upgrade and local benefits (Bridge, O'Neill & Cromie, 1998). A science park positively affects innovation output (Fukugawa, 2006; Yang, Motohashi & Chen, 2009). Yang et al. (2009: 84) highlight that:

These efficiency gains for NTBFs located within HSIP can be attributed to the support of governmental policies for firms' R&D efforts, the advantage of location, the clustering effect and network externality.

2.4 Disadvantages of Technology-Based SMEs

SMEs meet significant constraints because of their own limitations. Especially, technology-based SMEs share the same constraints with SMEs; meanwhile, they also experience distinct barriers because of their industrial nature. Briefly, they have limitations in terms of internal resources and external affects. Limited internal resources are: 1) limited financial capability, management resources and knowledge-base; and 2) limited human capital, both skilled employers and

managerial employers. These internal resource limitations mean SMEs lack the abilities to respond to, or be aware of, external environment, both opportunities and threats (North et al., 2001). Furthermore, limited external affects have been highlighted by North et al. (2001) in that SMEs have less ability to shape and affect the external environment than large firms. For example, they have less market power, weaker connection with customers and suppliers and less access to financial and labour markets.

2.4.1 Financial Disadvantages

It has been widely acknowledged that most SMEs face the challenge of financial limitation, and a large number of literatures have already studied the financial constraints of SMEs. The main financial characteristics of SMEs are:

- 1) Lower fixed to total assets ratios;
- 2) A higher ratio of trade debt to total assets;
- 3) Much higher the current liabilities to total assets ratio;
- 4) Heavily dependence on retained profits, in terms of funding investment flows;
- 5) More risky

(Cosh and Hughes, 1994; Cressy and Olofsson, 1997)

Especially, high-tech industries are more vulnerable in the capital market, because of the market imperfection, than other sectors. Most high-tech firms hold intangible assets the value of which is hard to be evaluated, and the return of investment on high-tech products is highly uncertain. As a result, high-tech sectors experience higher levels of information asymmetry and, thus, there are more financing constraints and funding gaps in high-tech sectors (Carpenter and Petersen, 2002).

Michaelas, Chittenden, and Poutziouris (1999) listed different theories on the determinants of capital structure in small firms and validated these hypotheses with the UK company panel data. The Modigliani and Miller theory (M&M) (Modigliani and Miller, 1958) suggested that the capital structure does not affect the market value of a firm, under a certain market price process, in the absence of taxes, bankruptcy costs, agency costs and asymmetric information. But, in the real economic world, these assumptions are far from true (Michaelas et al., 1999).

Thus, during the last 40 years, M&M theory of capital structure had been extended and three main theories have led capital structure research, including tax based theories, agency cost theories and asymmetric information and signalling theories, which explain the determinants of financial structure of SMEs from different angles (Michaelas et al., 1999).

Specifically, tax-based theories explain the reasons that small businesses use less debt compared with large firms. The theoretical overview of tax-based theories highlights the benefits brought by debt in that the debt interest shields income from taxation. Accordingly, the tax-paying firms with more profitability have more incentives to use debt rather than equity. However, in practice, many small firms do not use any debt. The reasons are that small firms are less profitable and have greater potential for bankruptcy than their counterparts. Also, small firms have lower marginal tax rates, which lessens the motivation to borrow from banks (Pettit and Singer, 1985).

The second theory, agency cost theory, also suggests that small businesses have fewer abilities to access capital markets. The agency cost theory states that agency costs rise when there are conflicts between stockholders and bondholders, because stockholders have incentives to benefit themselves at the expense of bondholders and do not consider maximising firm value. Small firms exhibit much higher agency costs than large firms, as small firms' owners/managers are likely to put their own and their venture's interests first. In addition, monitoring is more expensive in small firms; there will initially be significant costs to provide information to outside in. As a result, significant moral hazard and adverse selection problems are most likely to happen in small firms. More specifically, adverse selection happens when lenders have less information to ascertain the risk level. Small firms generally have higher levels of information asymmetry because of the varied quality of financial statements, which increases the difficulties of lenders to recognise the risk level. Furthermore, due to moral hazard, borrowers tend to invest in more risky projects, because, if projects fail, lenders will share risks with borrowers and, if the projects succeed, borrowers will enjoy all profits. To avoid these problems, the creditors require collateral when providing loans to small firms (Cowling, 1998).

Accordingly, the threat of bankruptcy costs and less profitability of small firms give small firms fewer motives to use external funds. In the meanwhile, banks and other credit institutions require collaterals when providing loans to small firms to avoid the possibilities of asymmetric information. Both mean that small firms have less access to external finance and encounter capital constraints. As a result, small firms prefer to use internal funds first, followed by debt and, finally, external equity, as the pecking order hypothesis mention (Michaelas et al., 1999).

According to studies on the finance of SMEs in Italy, Zecchini and Ventura (2009), argued that the small firms showed, on average, a ratio of financial debt to total financial assets which was higher than that of medium and large-sized enterprises. Michaelas et al. (1999) suggested that the capital structure of small firms is time and industry dependent. Small firms are much more sensitive to macroeconomic changes, so the economic condition has a negative relationship with short-term debt. On the other hand, long-term debt ratios are positively related to changes in economic growth. Therefore, it can be interpreted that, although small firms prefer to raise capital from internal sources, it is far from enough. The small firms have a need to raise external funds. The empirical study of Zecchini and Ventura (2009) suggested that bank loans (74%) are the largest component within the financial debt. The authors also mentioned that, although small firms heavily rely on external funding from banks, they are strongly affected by market imperfection. As small firms suffer from *ex ante* asymmetric information as well as agency problems related to the appropriate use of borrowed funds, it leads to the phenomenon of credit rationing and small firms are asked to pay higher interests than larger firms.

In summary, the capital structure theories suggested that small firms experience not only a lack of financial capital, but also difficulties to get access to the external financial sources. When SMEs need to raise external capital, bank loans are the priority for SMEs. The external financial sources required either higher ratio of interest rates or collaterals for borrowing to small firms, which increased the financial difficulties for SMEs.

2.4.2 Productivity and Human Capital Disadvantages

Small firms exhibit higher employment and sales growth, but this is not accompanied by productivity growth (Ayyagari et al., 2011). Small firms have

lower productivity growth compared with large firms. Thus, job creation does not accompany faster economic growth. The statistical data showed that there was a negative association between GDP/capita and small firms' employment contribution - small firms in low income countries contribute more to employment than high income countries (Ayyagari et al., 2011).

One of the most important reasons behind SMEs' lower productivity, and, thus, lower economic growth, was a lack of human resources. First, most SMEs are operated by owner-managers, thus the drawbacks of the small firms' managerial system may increase the possibilities of informality when a firm employs more than 20 staff (Roberts, 1992). The limits of informality include informal networks of recruitment drying up, informal styles of management communication and the involvement of personnel issues in business operation.

Secondly, most SMEs lack skilled employees. According to Holliday (1995), it can be found that large firms encourage the employees to take higher and further education or ask other firms to train their staff, while small firms tend to self-study through observation. More frequently, small firms discourage employees to develop transferable skills, especially firms operated by owner-managers.

Both entrepreneurial skills (e.g. innovation and creativity) and managerial skills are needed to operate a small business (Oberschachtsiek and Scioch, 2011). The inadequate abilities in terms of human capital pull down the overall performance of SMEs. Although entrepreneurship has, over the years, been widely acknowledged as a capability determined by genes (Nicolaou, Shane, Cherkas, Hunkin & Spector, 2008), from most evidence, those skills which entrepreneurs need could also be cultivated by education and training (Baumol, 1968). Moreover, Macdonald, Assimakopoulos, and Anderson (2007) proposed the assumption that higher level education and training for employees of SMEs will be positively related to firms' capabilities of innovation. And with more innovation, firms will become more competitive, creating more jobs and economic growth.

Accordingly, it can be found that human capital is the main resource to improve the overall productivity and, thus, have high economic growth at firm level. Not only the employees, but also the employers need to improve their skills to meet

the fierce market competition. Moreover, both entrepreneurial skills and managerial skills can be cultivated from education and training.

2.4.3 Market Disadvantages

For technology-based SMEs, they meet market disadvantages regarding R&D disadvantages and unfair market conditions. First, although firms have recognised that R&D improves productivity and, hence, increases economic benefit, there still remain problems of under-investment in R&D projects. The first reason for under-investment of R&D is that SMEs tend to finance R&D via private mechanisms (Lerner, 1996). The corporate finance literatures suggested that, even though there are substantial public venture programmes, young and high-tech firms prefer to finance R&D with private sources (Lerner, 1996). It is argued that venture-backed firms are forced to repeatedly return to their financiers for additional capital, because the investors need to ensure that money does not go to unprofitable projects. Moreover, managers of these venture-backed small firms tend to be monitored by venture capitalists (Lerner, 1996), which makes firms have less incentive to ask from public venture firms. Another reason is that the degree of R&D cost is relatively high compared with the degree of return at the firms' private level. The return at the social level is higher than the private level when firms do R&D (Hall, 2002). Also, Hyytinen and Toivanen (2005) mentioned that the R&D cost of SMEs is higher than their counterparts. Indeed, even simply imitating a new invention is not without cost; it costs 50-75% of the cost of the original invention. Thus, all these reasons cause under-investment in R&D.

In fact, investment in R&D differs from normal investment. Empirical study on R&D investment showed that more than 50% of R&D cost is for human capital, which creates intangible assets and will generate profits in future years (Hall, 2002). Therefore, the R&D investment is the degree of uncertainty associated with its output. The uncertain profit and high investment influence the impetus of R&D activities of small businesses on a certain level.

Secondly, many literatures suggested that SMEs perceive barriers such as legal environment and unfair market competitions, especially in less developed economies (Krasniqi, 2007; Mian and Khwaja, 2004). Muent, Pissarides, and Sanfey (2001) provided direct evidence with the case of Albanian SMEs. They reported that the existence of a large informal economy where entrepreneurs

avoid paying taxes and, thus, undercut the prices of the firms in the formal economy. Furthermore, an empirical study in Pakistan suggested that the politically-connected firms borrow twice as much and have 50% higher default rates (Mian and Khwaja, 2004). Politically-connected firms here refer to the firms whose directors participated in an election in Pakistan. This term in Chinese can be translated as “*guanxi*” (*special relationship*), which plays a significant role in China’s economic culture (Anderson and Yiu, 2008). It is argued that the most important ways Chinese entrepreneurs address obstacles to venture formulation is through *guanxi* (Guo and Miller, 2010). The competition of SMEs is extremely fierce due to not only the existence of informal economies as mentioned previously, but also the strong competitions with firms having *guanxi* and who have stronger power to take more resources.

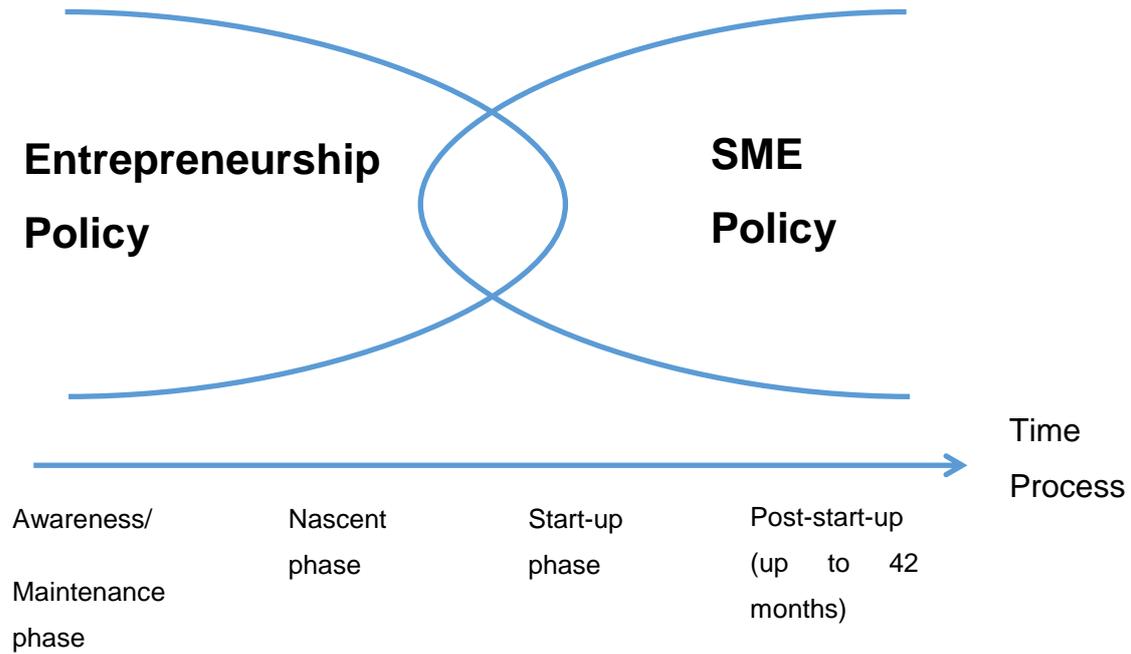
2.5 Policy to Support Technology-based SMEs

In this section, the policies to support technology-based SMEs will be presented. Following the literature, two types of policies will be studied in this section, namely entrepreneurship policy and SME policy. The two policies share some common aspects but also have some distinct objectives.

Entrepreneurship policy is more likely to target at the individual level, mainly entrepreneurs and potential entrepreneurs (Lundström and Stevenson, 2005). Usually, entrepreneurship policy has been treated as an important part of SME policy, but they are still slightly different. For example, SME policy makes greater use of “hard” policy instruments, such as financial subsidies, while entrepreneurship policy applies “soft” policy, such as education and training (Lundström and Stevenson, 2005).

Figure 2-3 illustrates the interface between entrepreneurship policy and SME policy. It can be seen that entrepreneurship policy is the base of SME policy. Without the efforts to establish a stable and activated entrepreneurial environment, the effects of SME policy will be limited.

Figure 2-3: The Interface between Entrepreneurship Policy and SME Policy



Source: (Shane, 2003)

In brief, entrepreneurship policy takes more effort in furthering entrepreneurial environment, and, thus, to encourage more people to consider entrepreneurial opportunities, while SME policy gives more focus at the firm-level in order to receive economic benefits.

Table 2-13 presents the policy priorities of each policy. It can be found that SME policies tend to promote the development of SMEs, while entrepreneurship policies are more likely to encourage people to start businesses. The entrepreneurship theory highlights the importance of external influential factors for the development of entrepreneurship, including social, culture, political, and economic factors (Lee and Peterson, 2000; Reynolds et al., 2002). In this sense, entrepreneurship policy aims to positively affect social and cultural context about entrepreneurship.

Table 2-13: Policy Priority

Policy Priority	SME Policy	Entrepreneurship Policy
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Barriers	Reduce red tape and paper burden for developing SMEs	Reduce regulatory, taxation and procedural barriers to starting a businesses
Finance	Improve access to financing	Improve access to start-up financing (e.g. micro-loans and seed capital)
Information	Improve access to information for development (e.g. market, government regulatory, business, and programme information)	Improve access to start-up information and guidance
Markets	Facilitate SMEs' access to domestic and international markets (e.g. tax reductions, export subsidies)	Promote networking activities
Human Capital	Improve the competitiveness of small firms (e.g. management skills)	Provide opportunities for people to learn skills and knowledge to start a business
Innovation	Foster R&D and technology adoption	Create awareness of entrepreneurship as a viable option

Source: Adapted from Lundström and Stevenson (2005)

To achieve the ultimate development of the economy, the integration of entrepreneurial policy and SME policy should be applied to cultivate the overall positive entrepreneurship environment. Accordingly, the entrepreneurship policy and SME policy will be presented in two sections.

2.5.1 Entrepreneurship Policy

Entrepreneurial activities are influenced by many areas of government policy, e.g. trade policies, labour market policies and even gender policy (Audretsch, Grilo & Thurik, 2007). A number of factors affect the mix of policy options, which are the prevalent views of the population towards entrepreneurship, the size and role of government, the structure of the labour force, the level of entrepreneurial activity and prevalence of existing SMEs.

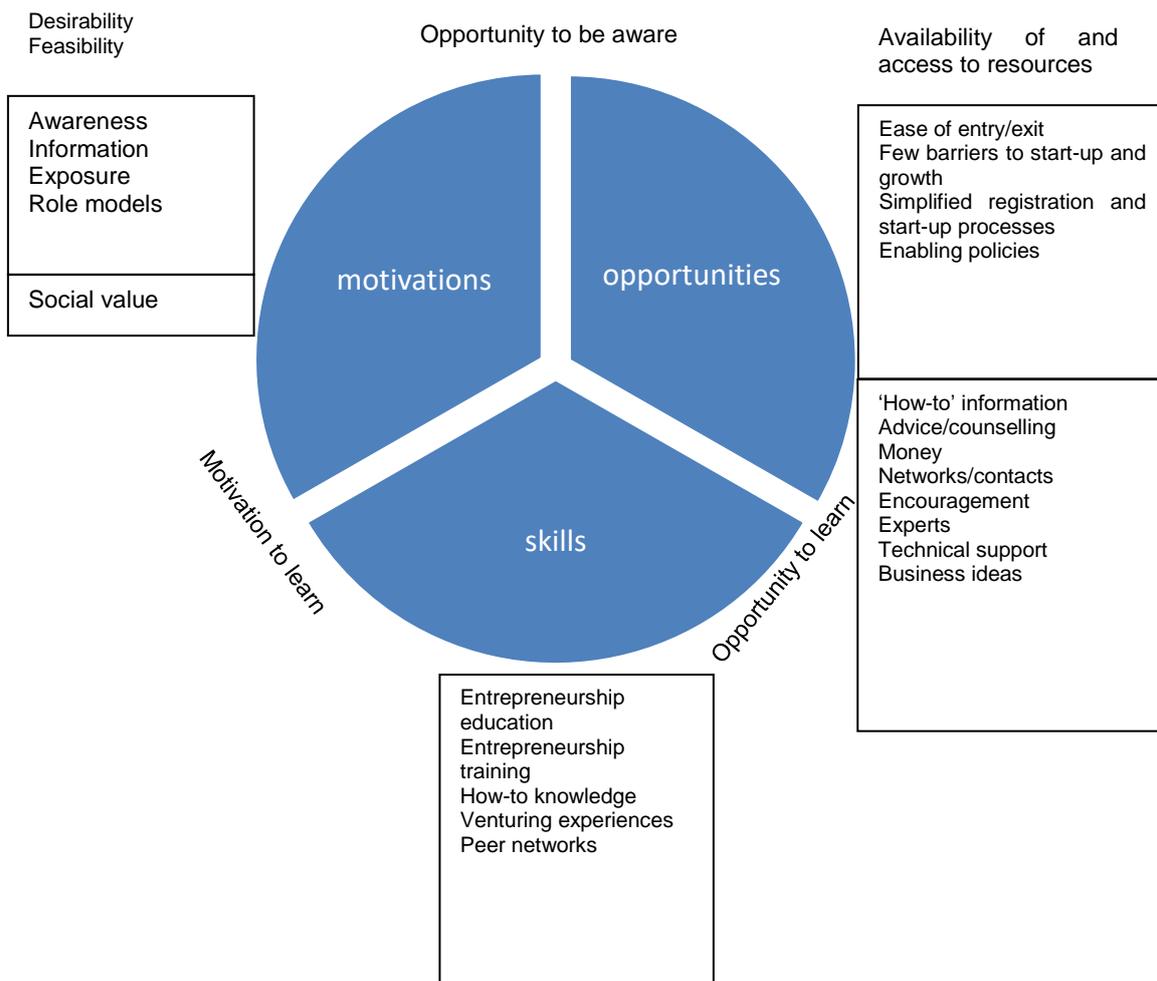
As previously mentioned, entrepreneurial activities involve the process of discovering and exploiting opportunities, and people's attributes and the external environment play significant roles during this process. The role of institutions and governments is to further environments to provide continuous supply of new entrepreneurs and also support them to successfully start and grow enterprises (Audretsch et al., 2007). For this purpose, the entrepreneurship policy should

logically focus on all parts of the entrepreneurial process, from awareness of opportunities and survival in early stages to the growth of an emerging firm.

The foundations of entrepreneurship policy should be applied to meet these obstacles of entrepreneurial processes (see Figure 2-4). The entrepreneurial processes can be simply described into three parts, namely motivation, skills and opportunity. According to Lundström and Stevenson (2005), entrepreneurship policy can be defined as that which is:

- aimed at pre-start, the start-up and early post-start-up phases of the entrepreneurial process,
- aimed to address the areas of motivation, opportunity and skills,
- aimed at encouraging more population to consider entrepreneurship as an option, to start and proceed into new businesses.

Figure 2-4: Obstacles of Entrepreneurial Process



Source: (Lundström and Stevenson, 2005)

From the study of national policies relative to entrepreneurship, the entrepreneurship policy can be categorised to six areas, namely entrepreneurship promotion, entrepreneurship education, the environment for start-ups, start-up and seed capital financing, business support measures for start-ups, and target group strategies (Audretsch et al., 2007; Stevenson and Lundström, 2001).

2.5.1.1 Entrepreneurship Promotion

From the GEM country reports, it can be found that the motivation to explore entrepreneurship is highly related to external environment, such as entrepreneurial culture or existing successful entrepreneurial role models (Audretsch et al., 2007). Entrepreneurship promotion is the activity that intends to create widespread awareness of the importance of entrepreneurship and small businesses in the economy.

According to Lundström and Stevenson (2005), the promotional objects includes five types: 1) sponsorship of television programmes and advertising campaigns; 2) entrepreneurship awards programmes; 3) promotion of entrepreneur role models through print publications; 4) sponsorship of national entrepreneurship-related conferences and regional events; and 5) use of radio, print media and webcasting to profile entrepreneurship issues. Policy makers spread policies via different approaches. The empirical data from the research of Lundström and Stevenson (2005) finds that the most frequently used method to spread entrepreneurship is that of awards programmes, almost three-quarters of the governments in the researched countries apply this approach to do entrepreneurship promotion, while just over half of the governments promote entrepreneurship through the mass media.

The main purposes of entrepreneurship promotion are: 1) building an entrepreneurial culture; 2) promoting a dynamic start-up market; and 3) encouraging more entrepreneurs in disadvantaged communities and underrepresented groups.

Furthermore, scholars have mentioned that promoting entrepreneurial culture is very important, and policy makers also stress the importance of this process, Lundström and Stevenson (2005) argued that, in most cases, countries which heavily promote entrepreneurship are those with already strong entrepreneurship

culture, high ownership levels, high SME density, or infant entrepreneur activity levels. Additionally, the high intensity and level of entrepreneurship promotion does not necessarily lead to higher start-up rates (Bosma and Wennekers, 2004).

2.5.1.2 Entrepreneurship Education

There are several reasons for governments to decide to push an entrepreneurship education agenda. For example, in the case of Finland, they put the benefit of addressing high youth unemployment as a major reason; furthermore, in Austria, it helps to improve long-term business entry and survival rates. Additionally, increasingly the literature has mentioned that innovation drives productivity and knowledge-based firms drive innovation. Increasing importance in university research creates more knowledge environments and, thus, there will be more knowledge-based firms to improve the innovation capabilities of firms (Lundström and Stevenson, 2005). Accordingly, promoting entrepreneurship education is an efficient way to improve the degree of productivity.

According to Audretsch et al. (2007), entrepreneurship education should include many subjects areas related to enterprising behaviours and entrepreneurship skills, and employ a cross-disciplinary approach. A recently developed view is that entrepreneurship education should not only focus on post-secondary level, but that elementary and secondary school level entrepreneurship education is equally important. However, as the elementary and secondary school level entrepreneurship education is a new area, there are few efforts to revise the programmes to provide opportunities to have entrepreneurship as a subject or a cross-curricular theme (Lundström and Stevenson, 2005). The main challenges in furthering entrepreneurship education in primary and secondary school level are lack of integrated extra-curricular programmes in the education stream, lack of teacher training materials and provision, and lack of a consistent framework for entrepreneurship education. Furthermore, courses of entrepreneurship at the post-secondary level are very pervasive, and are available for almost all disciplines. Research by Charney and Libecap (2000) showed that students taking entrepreneurship education are more likely to be self-employed. Additionally, small firms employing more entrepreneurship graduates had greater sales and employment growth.

2.5.1.3 Reducing Barriers to Entry, Early-Stage Growth and Exit

Reducing barriers are actions that reduce or modify regulations that directly or indirectly discourage the creation and expansion of businesses. Those actions involve a number of areas where government can make adjustments in terms of administrative, regulatory and legislative systems to further entrepreneurial activities (Lundström and Stevenson, 2005). Reducing the time and cost of registering new businesses, and improving the opportunities that entrepreneurs can exploit to start and develop businesses are the main targets for governments to reduce barriers. The policy can effect entrepreneurial motivation as well as create better opportunity conditions. The ongoing evidence that the administrative burdens of smaller businesses are proportionately heavier compared with large firms has led almost all governments to have incentives to initiate policies to reduce the administrative burdens on SMEs.

As indicated by Audretsch et al. (2007), there are four categories of policy actions to reduce barriers are: 1) ease of starting business, which is simplifying start-up procedures and processes; 2) legislation affecting entry and exit, which involves adjusting laws related to competition, bankruptcy procedures and filing of patents and intellectual property protection; 3) labour issues to create more flexible labour market regulations and requirements; and 4) taxation to improve taxation regime.

2.5.1.4 Start-up and Seed Capital Financing

Lack of access to finance has been the oldest and biggest problem for SMEs in the last half century, impeding their efforts to start, expand, modernise and grow their businesses (Cosh and Hughes, 1994). There are five major reasons why governments intervene in SME financing (Cressy and Olofsson, 1997): 1) loans to small firms pose higher transaction costs; 2) small firms have higher lending risk; 3) small and new firms rarely meet the collateral security requirements; 4) new technology-oriented firms show higher risk; and 5) small firms meet the problems of information asymmetry and fewer abilities to access information. Thus, when governments design financial policies, they usually target these problems. Specifically, the measures include reducing the transaction costs of loans to smaller businesses, sharing the risk banks take in lending to smaller businesses, providing smaller businesses more access to finance, increasing the flow of equity capital, and reducing the asymmetry of information for SMEs.

A multiplicity of measures used by most national-level government include the creation of small business banks, loan guarantee programmes, financing databases, venture capital programmes, support for angel investor networks, R&D seed capital programmes, the delivery of micro-loan funds and growth loan funds. All these policies are run to solve the problems that arise through “market failures” and improve the probabilities of “available access to finance” of small businesses (Audretsch et al., 2007).

2.5.1.5 Start-up Business Support

At the beginning stage, most governments are trying to address the barriers for new and potential entrepreneurs (Lundström and Stevenson, 2005). More specifically, the first trend is that government attempts to simplify the founding procedures, for example, setting up “single entry point” and “one-stop shops”. Secondly, governments use segmentation strategies to deliver support for SMEs. Different organisational structures, such as networks of government-operated or funded business service centres, and enterprise centres providing necessary advice for development of SMEs, are set up to meet the needs of smaller businesses. Thirdly, increasing standardised tools and products to support entrepreneurship and self-employment training programmes are set up by governments. Finally, the overall quality of business service and professional advice provided by governments to smaller businesses improves. The framework map of business support measures for start-up and growth firms configured by Lundström and Stevenson (2005) shows that the private sector, universities and colleges, and business associations work as an integrated system with government to provide necessary services that small businesses need.

2.5.1.6 Supporting Target Groups

Audretsch et al. (2007) found that, in order to increase the self-employment rates and entrepreneurial activities, most governments put their emphasis on supporting the under-represented populations, such as women, youth, ethnic minorities, people with disabilities, senior citizens, the unemployed, veterans, aboriginals and immigrants. For this purpose, it requires governments to create an entrepreneurial atmosphere with equal access to opportunities and resources to start a firm. There are special programmes to support each target group, though not all target groups have the same degree of support from governments.

2.5.2 SME Policy

As previously mentioned, SMEs have many disadvantages compared with large firms, for instance, lack of market power, informal managerial systems and insufficient capital (Storey, 2005). It is the responsibility of public policies to “offset” these disadvantages. Government intervention is (Storey, 1982: 49):

justified only where the private and social costs and benefits (of new firm formation) diverge, or where the existing distribution of income significantly distorts the extent to which willingness to pay reflects an individual or groups demand for a good or service.

In this section, the supportive policies to technology-based SMEs will be presented. The policies have been grouped into five categories, including financial policy, innovation-related policy, human capital policy, internationalisation policy and networking-related policy. It is difficult to have clear groups, as each policy might overlap in some areas. These groups were categorised based on the understanding of the author, but it shows little difference to the overall knowledge suggested in this field. For example, Table 2-14 displays the main EU policies aimed at SMEs. Eight groups of policies are shown in the table, namely administer incentive, payment delay, finance, information, employment training, R&D and entrepreneurship. The major aims of these policies were to increase the competitiveness of national and regional productive systems and enable SMEs to participate in high technology markets (Parrilli, 2007). Those eight policies can be grouped into the five categories, as mentioned above, which is shown in the first row of the Table 2-16.

Table 2-14: EU Actions Implemented from May 1997 to End of 1999

Main groups in thesis	Human Capital	Finance	Finance	Internationalisation	Networking	Human capital	Innovation	Human capital
In document	Administer incentive	Delay in payment	Finance	internationalisation	information	Employment training	R&D	Entrepreneurship
Belgium	✓		✓	✓	✓	✓	✓	✓
Denmark	✓		✓	✓	✓	✓	✓	✓
Germany	✓	✓	✓	✓	✓	✓	✓	✓
Spain	✓		✓	✓	✓	✓	✓	✓
France	✓		✓	✓	✓	✓	✓	✓
Ireland	✓	✓	✓	✓	✓	✓	✓	✓

Italy	✓	✓	✓	✓	✓	✓	✓	✓
Luxemburg	✓		✓	✓	✓	✓	✓	
Holland	✓		✓	✓	✓		✓	✓
Austria	✓		✓	✓	✓	✓	✓	✓
Portugal	✓		✓	✓	✓	✓	✓	✓
Finland	✓		✓	✓	✓	✓	✓	✓
UK	✓	✓	✓	✓	✓	✓	✓	✓
Switzerland	✓		✓	✓	✓	✓	✓	✓
Norway	✓	✓	✓	✓	✓	✓	✓	

Source: Adapted on the basis of the information provided in the Observatory of European SMEs,

2003

The next section will explain further the policies benefiting technology-based SMEs. The advantages and disadvantages of policies will also be examined. Finally, in the conclusion, the knowledge gap identified in extant literature will be indicated.

2.5.2.1 Financial Policy

Schmitz and Musyck (1994) showed two characteristics of small businesses from the previous literature, that they: 1) rely strongly on the savings of the owners or their family; and 2) rarely get access to credit, which is the key obstacle for the development of small firms. The latter is particularly serious for small firms who pursue expansion and innovation. Detailed financial disadvantages of SMEs, as well as technology industries, were presented in Section 2.4.1. For people who lack initial capital or additional funds, bank loan is the most common way for raising money. Local banks in European countries play a major role in supporting enterprises. However, the drawback of credit from local banks that generates a bad-loan crisis has been confirmed by many scholars. To avoid the negative influence of local bank credit (e.g. over lending), they increase the price of credit. Nonetheless, it cannot significantly differentiate the results (Signorini, 1994).

Thus, the technology-based SMEs meet the barriers of either lack of access to the bank loans, or higher price of credit. In order to mitigate these financial difficulties met by technology-based SMEs, financial support has become the major tool of governmental support. From the literature, it can be found that, in

almost all countries, financial policy is applied to support technology-based SMEs. Stiglitz (1993: 33) argued that

[t]here is a growing consensus that if the government goes where the private market fears to tread, it should do so only cautiously and with safeguards. The government faces the same (and sometimes worse) information problems; it is no better a screener of loan applications, and no better monitor. Worse still, it often faces political pressures.

From the empirical studies, it can be seen that the subsidised loan and loan guarantees to SMEs have been the most often applied as financial supportive tools. In Germany, the only efficient institutional support for innovative firms is the Landeskreditbank (LKB), which provides the regional governments' low-cost credit for innovating firms. These enterprises should satisfy at least one of the following conditions: develop new products or processes; put new techniques into practice; set up new technology intensive enterprises. Between 1984-1988, the programme supported more than 2,600 enterprises and spent DM 214 million of public expenditure (Becher and Weibert, 1990). However, for less innovative sectors, the credit guarantee has exhibited negative impact. Swinnen and Gow (1999) suggested that, according to the research in developing countries and OECD countries, the subsidised loan can generate serious negative impacts upon the efficiency of credit allocation. Because the subsidies are paid directly by government's budget, it may, therefore, cause a budget deficit or induce increased government borrowing, both of which will negatively affect inflation rate and nominal interest rate. Swinnen and Gow (1999) argued that, for long-term development, investing in public goods or infrastructure might generate better effects rather than direct support.

The second frequently used method is credit guarantee. Specifically, the credit guarantee institutions give warranty to SMEs in respect of removing the risks of private financial institutions to lend. For example, in Italy, 83% of bank loans to small businesses are reliant on guarantees (Zecchini and Ventura, 2009). There are three major measures to support small businesses in Italy, from both private and public sectors: (a) mutual guarantee institutions, (b) banks and other institutions providing guarantee services to enterprise sectors; and (c) public funds offering guarantees (Zecchini and Ventura, 2009). The credit guarantee increases SMEs' accessibility to private financial sources. On one hand, the credit

guarantee enhances the competitiveness of SMEs which suffer from market failure and lack of collateral (Zecchini and Ventura, 2009). On the other hand, according to Cowling and Mitchell (1997), credit guarantee schemes may increase the self-employed rate because the start-up capital is available for a number of marginal unemployed people. From the Korean data analysis, the credit guarantee scheme positively affected firms in the respect of the growth of sales, employment, wage levels and the survival rate.

Mutual-based guarantee is a very common method for Italian small businesses to obtain credit and is based on the institutions of private sectors rather than a government mechanism. More specifically, the Loan Guarantee Consortia of Modena in the Emilia-Romagna region, which includes 3,500 SMEs, provides mutual credit guarantees. Firms in the region pay a membership fee to make up a loan guarantee fund, which then has a supplement from municipal, regional and national governments. Small firms gain access to loans based on the strength of their projects and their community standing rather than collaterals. Accordingly, the failure rate is much lower than traditional bank loan (Schmitz and Musyck, 1994). Zecchini and Ventura (2009) suggested that mutual-based guarantees can obviate some of the moral hazard problems that limit banks' credit to SMEs. However, hindered by the same adverse selection problems, banks were eventually led to ration their lending to risky firms. Less risky SMEs are actually reluctant to enter into mutual guarantee agreements with other firms, knowing that close monitoring of their peers' performance is difficult and that such guarantee schemes attract more risky firms (Zecchini and Ventura, 1999: 192). Thus, mutual-based guarantees could not entirely eliminate the moral hazard problems. This type of guarantee scheme will attract more risky firms, which leads banks to ration their lending.

Not only private credit guarantees, but government credit guarantee schemes still remain to be tested. Vogel and Adams (1997) argued that the guarantee schemes are highly costly, as most countries suffered from relatively high loan default rates. Also, it has been criticised that there are negative effects that make SMEs rely highly on government support and policy measures (Oh, Lee, Heshmati & Choi, 2009). Many scholars argue that the financial support from governments is not beneficial for long-term performance of SMEs -- it is the quality of human capital rather than the financial constraints that finally influences further survival rates of

SMEs (Cressy, 1996). Cheap credit provided by public credit guarantee schemes can lead to excessive lending, which might be lent by low-ability entrepreneurs and occur moral hazard (Oh et al., 2009).

2.5.2.2 Innovation-Related Policies

Recent policy trends have exhibited a growing tendency to support innovation (Hoffman, Parejo, Bessant & Perren, 1998). As presented in Section 2.3.1 Concept of Innovation, innovation is not the same as R&D and has a wider definition. However, R&D activities are easier to be recognised by policy makers. R&D can build knowledge and, thus, generate inventions (Rosenberg, 1990; Stam and Wennberg, 2009). It improves firms' capabilities to comprehend and imbibe knowledge (Cohen and Levinthal, 1989; Stam and Wennberg, 2009). Thus, most innovation-related policies are more likely to support R&D activities.

It is assumed that innovation has positive external effects, but, from the empirical studies, it is argued that innovation projects may result in market failures (Almus and Czarnitzki, 2003). As Hall (2002) mentioned, the benefit return to the social level is higher than that to private level when firms do R&D. The positive benefits to society do not cover the private cost (Almus and Czarnitzki, 2003). In order to improve the social return, governments have motivators to encourage more R&D investment to fill the gap of under-investment of private R&D projects.

From the literature, the R&D subsidies and taxes are the main policies which improve the R&D capabilities. Almus and Czarnitzki (2003) suggested that firms with R&D subsidies achieve a relatively higher R&D intensity. In fact, the firm-level or industry-level productivity has a relationship with publicly-funded R&D, but very limited effects (Griliches, 1986; Hall and Mairesse, 1995). More studies carried out by Nadiri and Mamuneas (1994) found that there was positive relationship between publicly-funded R&D and the cost structure of industries, but the result changed over time and industries. Although the effects of publicly-funded R&D on the performance of firms are not clear, based on several studies done by many scholars, there is a common conclusion that public expenditure on R&D will replace private funded R&D. Increasing publicly-funded R&D may drive firms to have fewer motives to fund R&D at the private level. Specifically, firms always have motives to apply for public support of R&D, even though they have the abilities to finance the R&D projects. When firms receive grants from

government, firms might simply replace the private R&D fund with public funds, which results in less investment in firms at the private level. To avoid the crowding-out effect between public and private investment, it is necessary to take this into account when considering the level of their engagement in R&D support programmes (Almus and Czarnitzki, 2003).

Moreover, Czarnitzki and Hussinger (2004) observed that, if the full crowding-out effects occurs, there will be no technological performance. Even if there is no crowding-out effects, it is still doubtful that R&D subsidies will result in technological and economic growth. This is because government has incentives to choose projects that have more social benefits, while firms tend to start with projects promising the highest expected returns. This conflict of interest makes the return of public investment much slower (Czarnitzki and Hussinger, 2004). The information asymmetry between government agencies and innovative firms, as well as the moral hazard, increases the possibilities of distorted use of subsidies (Czarnitzki, Hanel & Rosa, 2011).

The literature argues that there are two types of R&D, namely vertical R&D and horizontal R&D. Vertical R&D occurs when it is aimed to improve the quality of existing products and horizontal R&D is used to expand the products in industries. Both types of R&D drive firms to become leaders in industries and make more profit from the monopoly advantage. The vertical innovation and horizontal innovation are two engines of growth, and, in general, one engine will be stronger than the other. It is argued that long-term growth will only increase when the innovation type of subsidies matches the main engine of the industry (Segerstrom, 2000). It is crucial for policy makers to identify the main engine of industries when establishing subsidy policy to achieve long-term economic growth.

Haaland and Kind (2008) argued that optimal R&D subsidises will decrease trade costs. In addition, Hyytinen and Toivanen (2005) suggested that government funding of R&D has positive effects on innovation, productivity and globalisation. Firms with more government funding will be more growth-oriented and firms who are more reliant on external finance generally invest more in R&D. As a result, the government funding may alleviate capital market imperfection. Although, because of the economically significant imperfections in the capital market, this may sometimes lead to disproportionately helping firms who need external

finance (Hyytinen and Toivanen, 2005). In general, it is believed that R&D subsidies have a positive relationship with long-term rate of economic growth (Segerstrom, 2000). Also, Haaland and Kind (2008) argue that R&D subsidies may ultimately result in a reduction of product diversity in the market. It turns out to be true when government sets R&D subsidies for the purpose of maximising domestic welfare and aggregate welfare. Furthermore, these corollaries have made a simplifying assumption that all products are exported to third markets only and are abstracted from consumer-surplus effects.

Finally, when government agencies administrate subsidies they face influencing factors such as bureaucratic objectives, corruption, political pressure and incompetence. These factors will affect the result of R&D subsidies (Czarnitzki et al., 2011).

With the disadvantages of R&D subsidies pointed out in many studies, some scholars have mentioned that R&D tax credits might be a neutral form of encouragement tool. All firms involving in R&D activities and incurring R&D expenditures can claim them, irrespective of size, industry and innovation objectives (Czarnitzki et al., 2011). Another reason attracting policy makers to tax credit is that it does not involve arbitrary decisions of government agencies when distributing support to R&D firms.

Czarnitzki et al. (2011) find that the R&D tax credit recipients result in higher innovation output, in terms of sales shares, introduction of market novelties, competitiveness and product innovations. Hall and Van Reenen (2000) also stated that tax credit reduces the marginal R&D costs and the “crowding out effect on industrial R&D spending is not expected to be affected except via the increase of the real cost of R&D inputs.”

Although R&D credit stimulates R&D activities, it does not overcome the sources of market failure related to innovation activities. R&D credit affects the constitutions of R&D and drives innovative firms to invest in projects promising the largest short-term return. Thus, projects with potential high social return may be less stimulated (Hall and Van Reenen, 2000). David, Hall, and Toole (2000) also noted that, although R&D credit is an effective way to minimise “government failure”, they are not the most efficient tool to minimise “market

failure” related to under-investment of R&D and gaps between the social and private returns from innovation.

Other than the R&D subsidies and tax credit, government agencies also provide opportunities to universities and non-profit research centres to have a financial stake in an SME. It is a win-win policy. On one hand, it provides a route to universities and research centres for practical application of innovation work; on the other hand, it strengthens the capabilities of an enterprise by giving it a financial partner and access to R&D (Kommission, 2005).

2.5.2.3 Human Capital

As presented in Section 2.3.4, since the future is essentially unpredictable, it requires firms to have more creative initiatives from employees to adapt to a rapidly changing environment and, thus, create the desired future (Thurow, 1996). It is strongly agreed that the knowledge-workers create both extraordinary opportunities and challenges, especially workers in management (Drucker, 1993). Drucker (1993) suggests that human capital is significantly important, especially in technological entrepreneurship. According to human capital theory, the employees with more human capital in terms of education and experience are more productive than their counterparts in the technology or entrepreneurial industries (Wright, Hmieleski, Siegel & Ensley, 2007). However, SMEs have fewer motives and capabilities to provide education and training to employees because of the lack of human and financial capital. To promote the overall innovation, it requires government interventions in respect of human capital. The human capital policy literature frequently mentions vocational training and education and providing external expertise.

In developing countries, managerial and technological training has become the most popular support measures among all for SMEs, as providing training is much easier than most of the other measures (Schmitz and Musyck, 1994). Specifically, in less-developed countries, a general feature of the successful industrial districts is that they have proactive measures in investing in human resources. The main characteristics of the training programmes are that they are codetermined by private sectors and also practically oriented (Schmitz and Musyck, 1994).

Empirical studies also show some successful cases in OECD countries; in these countries, private sectors play more important roles than government. For example, in Italy, new local training schemes based on the public sectors, privately owned firms and employers' associations are applied in many industrial districts. Based on the study by Schmitz and Musyck (1994), the training schemes of local level are most appropriate, as the private sectors play an important role for co-regulating and co-financing in the schemes. Moreover, in the West Jutland of Denmark, Kristensen (1992) studied the regional training schools in the industrial districts, and found that such schools played an important part in the development of local industry. Different education and training institutions have been successfully established in Herning and the strategy has transferred from simply making occasional use of new opportunities to providing more educational choices for different purposes.

Another tool is to provide external expertise that can influence the decision-making of founders who start a business (Oberschachtsiek and Scioch, 2011). In term of providing external expertise, Czarnitzki et al. (2011) mentioned that it is the responsibility of government to provide new or updated technology for public sector functions and bridge universities and research centres with SMEs.

As economic development and employment boost are the main goals for authorities, self-employed individuals and entrepreneurs play an important role, and they are also considered as key elements in political strategies (Oberschachtsiek and Scioch, 2011). Past research had concerned that limited capital, as well as expertise ability, are the main constraints for promoting self-employment (Cressy, 1996). In this context, financial support alone cannot totally help to promote self-employment; a more integrated support is needed. Viewed from the government perspective, an active labour market policy is an involvement of training schemes into employment policy to enhance the chances of unemployed people to find re-employment (Oberschachtsiek and Scioch, 2011).

2.5.2.4 Networking

In order to make clear the meaning of networking, it is best to start from “network” and “cluster”. Ceglie and Dini (1999) emphasised that a “Network” involves cooperated firms in a joint development project, coordinating and making use of

their own specialist areas to overcome common problems, and reach efficient market scale, while “Cluster” mostly indicates a sectorial and geographical concentration of enterprises. The firms clustered have related or complementary products and, thus, face mutual opportunities and threats. The concentrations also engender some exclusive external economies, such as technical, administrative and financial matters. A network of public and private local institutions benefits from clusters, which help promote collective learning and innovation through coordination. Finally, the “networking” should be considered as the combination of networks and clusters, and characterising both actions (Ceglie and Dini, 1999).

From studies around the world, SMEs can rarely succeed without networking with other firms (Huggins and Williams, 2009). They combine the resources and forces to exploit agglomeration economies, which makes them capable to compete with large firms in the international markets (Schmitz, 1992). Keeble and Nachum (2002) researched the reason for small businesses’ clustering, especially service sectors and high-tech sectors, and found that clustering improves localised collective learning processes and inter-firm networking. Successful knowledge-based clusters are also associated with the evolution of innovation. Thus, SMEs who cluster seem to grow and upgrade more easily (Altenburg and Meyer-Stamer, 1999). Clusters generate positive externalities that improve the abilities of managerial and technical learning, which are common among traditional small-scale and labour-intensive businesses.

Networking among enterprises, agencies who provide the business development services and local governments can build a shared local development community which enhances entrepreneurial strategies through giving strength to collective action (Ceglie and Dini, 1999). Individual SMEs have problems due to their size, whereas, through networking, an SME could reduce their limitations and improve their competitive position.

SMEs have three cooperation methods, namely horizontal cooperation, vertical cooperation and inter-firm cooperation. For example, through horizontal cooperation, small enterprises can corporately achieve scale economies which are beyond the limits of an individual SME and enlarge the production capacities to fulfil the large-scale orders. Also, they can achieve optimal scale with a higher

efficiency production procedure which cannot be satisfied by a single small enterprise and can obtain bulk-purchase inputs (Pyke, 1992). Through vertical cooperation, SMEs could focus on specialised core business and provide for an external division of labour (Marshall, 2006). Through inter-firm cooperation, a corporate learning space is generated where ideas and knowledge are exchanged, developed and shared, which helps the cooperated firms collectively improve product quality and expand profitable market segments (Best, 1998). According to Zhou and Xin (2003), small high-tech firms that cluster with Multinational Corporations (MNC) may get opportunities to receive organisational and technological training from MNC and to develop their innovation capacity and market networks in local markets.

Dana (2001) highlighted the importance of networks in the cultivation of entrepreneurial skills, which could be enhanced in both formal and informal networks. Networks provide access for individuals to learn and to be trained. The use of external advice has positive relationship with firm growth. The providers of external advice include private sector professionals, social contacts of friends and relatives, contacts established through supply chain, and a wide range of government-backed initiatives (Robson and Bennett, 2000). Through networks, skills and knowledge would be transferred from successful ones to budding entrepreneurs. For example, individuals could learn a great deal about marketing, sourcing, distribution logistics, production, regulation and customer service via a network. However, not all individuals have access to a business network.

Networking programmes are generated by the network demand which usually strengthens their use by the enterprises. As such, they are not in competition with other business development services. The enterprises get channelled to other service providers or technical and financial providers. It is the main benefit rather than being directly satisfied by the project itself (Ceglie and Dini, 1999). (Ceglie and Dini, 1999).

The literature suggests that the successful clusters and inter-firm cooperation do not always happen spontaneously, although the networking brings potential benefits for enterprises (Ceglie and Dini, 1999). Spontaneous networks and clusters rarely develop in the real economic environment, because: a) looking for suitable network partners and strengthening the relationship needs high

transaction costs; b) information and innovation, as the important inputs for networking development are difficult to pursue in imperfect markets; and 3) the networking needs a legal framework to back up to reduce the “free riding” risk, especially for areas with legal framework that is relatively underdeveloped.

As a result, policy makers in developing and developed countries have considered the positive effects of clustering and, thus, established cluster and cluster-related policies to support the SME clustering. Most nations have established governmental and non-governmental institutions to support and teach small enterprises (e.g. the PHD Chamber of Commerce and Industry and the Entrepreneurship Development Institute in India, and the Small Enterprises Development Programme in Indonesia).

SME clusters in developing countries are formed by small and micro firms with low quality productions and obsolete or manual techniques. Usually, these firms have no specialised labour and no clear division of craft, and also have limited market share and low-income consumers (Parrilli, 2007). Those clusters can be treated as embryonic kinds of clusters with development potential, and, in the later stage, involving stable agglomerations.

A number of literatures have found that the intervention of an external agent as an activator to promote the development of networks and clusters can reduce the significance the above factors. For instance, Nadvi (1995), who studied the developing countries, such as Brazil, Mexico and India, provides interesting examples of successful interventions targeted at promoting cooperative relations within SME clusters. Also, Humphrey and Schmitz (1995) researched on the Chilean PROFO (Proyectos de Fomento) programmes that comprise a wavy designed set of public incentives, and found the public programmes had facilitated the establishment of about 450 SME networks with significant increase in SME profitability and sales (Ceglie and Dini, 1999).

2.5.2.5 Internationalisation

In this thesis, internationalisation-related policies are considered as parts of policies because the literature suggests that increasing numbers of small firms have expanded into the international markets since their infant stage (Fillis, 2001), especially high-tech industries (Knight and Cavusgil, 2004). The studies of Moen and Servais (2002) and Rennie (1993) suggested that “born global” firms first

emerged in countries with small domestic markets, and then start to markedly expand their markets to international. This phenomenon is relatively universal when examining the major trading countries. The atmosphere of the global market, such as globalisation effects, specific industry factors, the technology impacts and the bypassing of traditional barriers to entry push small firms into going to the international market in their early stage. Small firms take advantage of their abilities in flexible customise service and products, which are enhanced by intuitive networking and entrepreneurially-based competencies in terms of creativity and innovation (Fillis and McAuley, 2000; Fillis, 1999). Internationalisation, innovation and entrepreneurship have a deep connection. In the innovation-related internationalisation model, the decision itself to expand into the international market can be seen as innovation (Andersen, 1993).

Some scholars have mentioned that entrepreneurs with international experience and awareness are able to connect resources from multiple countries and, thus, meet the demand of the international market (McDougall and Oviatt, 1991; Oviatt, McDougall, Simon & Shrader, 1993; Ray, 1989). Furthermore, new ventures with international vision from inception, strong market networks to provide innovative services and products, and a tightly managed organisation are more likely to survive in international markets (Glickman and Woodward, 1989; Phillips McDougall, Shane & Oviatt, 1994).

Current studies on the internationalisation of smaller firms more tend to highlight the importance of network and innovation (Andersen, 1993; Coviello and McAuley, 1999; Johanson and Mattsson, 1988). The creativity and innovative thinking, risk tolerance, abilities to identify opportunities and network with other firms have been treated as the main factors for the degree of internationalisation (Carson, Cromie, McGowan & Hill, 1995; Fillis and McAuley, 2000). Fillis (1999, 2000) has mentioned that smaller firms who can take good advantage of an overlap between marketing and entrepreneurship competencies develop and enter into the international market much faster than other firms. Experience also tends to be one of the main factors affecting the motivation of extending international operations (Fillis, 2001). The experience is usually accompanied by success, which helps to construct a stronger package of advantages. Poor performance in the international markets is one of the reasons that causes lack

of planning, international marketing and an attitude to take risk and uncertainty (Johanson and Vahlne, 1990).

When comparing the motivations of older firms and “born global” to international markets, it can be found that tangible resources, such as financial and human resources, drive older firms, while intangible knowledge-based capabilities are the main resources for “born global” (Knight and Cavusgil, 2004). Moreover, the managerial and entrepreneurial knowledge is the main driver of superior performance. The knowledge of international markets and the efficiency to obtain the knowledge are the crucial determinants of superior international performance (Autio, Sapienza & Almeida, 2000). Such abilities help firms to overcome the liabilities of foreignness and newness (Oviatt and McDougall, 1994). Finally, the dimension of born-global firms which have less deeply rooted administrative heritage turns out to be a key advantage when expanding their international markets compared with well-established firms (Collis, 1991). When firms get older, unlearning embedded routines becomes the most difficult task, as new markets contain new knowledge which requires new routines, which may conflict with existing operations and management’s embedded mental models (Autio et al., 2000). According to organisational learning theory, conditions with little or no existing organisational routines to unlearn will generate the development of new knowledge (Autio et al., 2000). As a result, “born global” firms may benefit in terms of knowledge acquisition when entering international markets.

Accordingly, it can be found that small firms who expand international markets do rely more on innovative and entrepreneurial attributes, such as creativity, adaptability and learning abilities.

Haaland and Kind (2008) highlighted the function of R&D relevant to internationalisation. The authors mentioned that R&D subsidy policies would improve the internationalisation of a firm. According to Haaland and Kind (2008), from a simple two-country model, two firms from different countries which produce horizontally differentiated products could have process-improving R&D, which will reduce marginal production costs and trade costs. Thus, it helps to create freer trade between countries. Increased market size makes it profitable to invest in cost-reducing R&D and, thus, increases sales in domestic and foreign markets, and reduces production costs and consumer prices. Further, it implies

more exports between countries because of fewer production costs and increasing markets. Also, R&D subsidies increase foreign firms' R&D activities. R&D subsidies that encourage domestic firms' production may increase foreign firms' impetus to R&D and, finally, have knowledge spillovers in the markets. From this perspective, R&D subsidies could be treated as an active tool to facilitate both domestic and foreign firms' R&D and would make more profits. The benefits brought by R&D improve the motivations of government to increase R&D subsidies.

Thus, Neary and Leahy (2000) emphasised the point that R&D policies might be the second-best choice for government to support domestic firms in global markets. Brander (1995) also argued that, compared with export policies, R&D policy, especially R&D subsidies, is a more robust instrument.

However, small firms that go global will meet more constraints and threats, as well as the opportunities, compared with their counterparts. The main constraints to SME internationalisation are limited firm resources and international contacts, as well as inadequate managerial knowledge about internationalisation. The resource limitations, especially the limited financial resources, should be the most prevalent constraints among SMEs (OECD, 2009). According to the OECD-APEC study on the most serious impediments to SME internationalisation (see Table 2-15), there are ten top barriers to internationalisation. The financial limitation ranked in first place, followed by lack of abilities to find opportunities and limited information. There are some differences between barriers by SMEs and Member Economies. Surprisingly, for the Member Economies, the leading barrier is not financial limitation, but human resources. This might support the study by Ojala and Tyrväinen (2007) that most of the barriers are firm-specific and related to capabilities and resources of firms to operate in the market. Some other barriers that are not listed in the top 10 barriers have been noticed in recent studies, for instance, technical and administrative difficulties, documentation and payment problems, foreign market competition and exchange rate. However, these barriers are not the most prevalent and seem to decrease with the accumulation of knowledge about internationalisation.

Table 2-15: Barriers Ranked Using the Top Ten Ranking Method

Rank- Weight ed factor	Description of barrier	
	Barriers ranked by SMEs	Barriers ranked by Member Economies
1	Shortage of working capital to finance exports	Inadequate quantity of and/or untrained personnel for internationalisation
2	Identifying foreign business opportunities	Shortage of working capital to finance exports
3	Limited information to locate/analyse markets	Limited information to locate/analyse markets
4	Inability to contact potential overseas customers	Identifying foreign business opportunities
5	Obtaining reliable foreign representation	Lack of managerial time to deal with internationalisation
6	Lack of managerial time to deal with internationalisation	Inability to contact potential overseas customers
7	Inadequate quantity of and/or untrained personnel for internationalisation	Developing new products for foreign markets
8	Difficulty in matching competitors' prices	Unfamiliar foreign business practices
9	Lack of home government assistance/incentives	Unfamiliar exporting procedures/paperwork
10	Excessive transportation costs	Meeting export product quality/standards/specification

Source: OECD-APEC 2007

There are a number of uncontrollable factors in global markets (see Table 2-16), for instance, different economics and cultural environment, and fierce local foreign competition, which make entrepreneurial decisions more complex. More specifically, operating businesses cross-board will involve different economics, which means different governmental regulations, currency valuations and distribution systems. Thus, entrepreneurs should create a business strategy for adapting to distinctive environments. Furthermore, firms doing businesses with countries that have a different economic development level need to concern with the fundamental infrastructures; especially when firms have business with less developed countries. For instance, lack of electricity, adequate educational systems and well-developed legal systems. Moreover, the flexible exchange rates influence the value of a nation's currency and, thus, will affect business transactions between countries. Finally, firms entering new markets should be aware of the local competitors who have already grabbed market share and established loyalty. As a result, Internationalisation requires firms to build

knowledge of the foreign culture and economics, and be aware of local foreign competitors. Other “soft” factors, such as network and supply chain links, could stimulate SMEs to internationalise (OECD, 2009), which reflects the recently emerging trends.

Table 2-16: Differences in Doing Global versus Domestic Business

• Economics
• State in economic development
• Balance of payments, balance of trade
• Type of economic system
• Political-legal environment
• Cultural environment
• Technological environment
• Local foreign competition
• Subsidies offered by foreign competition

Source: Hisrich (2012)

As the constraints mentioned above have held back the internationalisation pace of SMEs, there are increasing support provisions to redress international barriers, including financial, contractual, informational and managerial knowledge-related barriers, being established by sub-national, national and supra-national organisations (OECD, 2009).

Firstly, as financial limitation is the top barrier, as previously mentioned, most OECD countries and non-OECD countries provide a set of support measures to redress it, and the level of support provisions are equally strong among them (OECD, 2009). Specifically, interventions tend to use medium and longer term export credits not shorter term credits, which are not allowed by EU member states. Furthermore, supra-national institutions like the World Bank/IFC and European Investment Funds provide support for individual firms; thus, the aim of interventions includes providing access to and information about such programmes. Some other supports, like venture capital funding, credit guarantees and information sharing, are also widely adopted by countries. Secondly, in terms of informational and contact barriers, there is also a range of support programmes targeted at them. For example, the UK Trade and Investment’s Passport to Export Service and the Overseas Market Introduction Service (OMIS) which provide access to personalised research at overseas

offices for new exporters and which is based on the Internet. Support programmes mainly aim at providing information such as identifying export potential, key foreign contacts and obtaining relevant advice and intelligence.

2.6 Summary and Conclusion

This chapter has brought together several theoretical conceptualisations: SMEs, entrepreneurship theory, innovation theory and policy. It began with an introduction of SMEs as a term with a variety of definitions from country to country. The importance of SMEs regarding the positive influences on economic growth, job creation and innovation had been introduced.

Section 2.3 indicated the connections between innovation, entrepreneurship and technology-based SMEs. The definitions of innovation, entrepreneurship, technology-based SMEs and science parks have been identified in this section. It highlighted that innovation plays an increasingly important role in maintaining competitive advantage (Thurow, 1996). Most importantly, this section illustrated the external and internal influential factors of entrepreneurship. The opportunities are generated from external influential factors, such as political changes, technological changes and social/demographic changes (Shane, 2000). Furthermore, recognising, discovering and exploiting opportunities, and finally product launch and value created need certain personal attributes (Shane, 2003). Finally, the positive effects of a science park on innovative outcomes (Yang et al., 2009) has been highlighted.

Section 2.4 examined the disadvantages of technology-based SMEs. Financial limitations, productivity and human capital disadvantages, and market related disadvantages had been identified. Technology-based SMEs meet more financial limitations than other SMEs because most of them hold intangible assets which are hard to be evaluated and the return of investment is highly uncertain (Carpenter and Petersen, 2002). Furthermore, it is suggested that human capital disadvantages causes SMEs to have lower productivity growth. Lack of skilled employees (Holliday, 1995) and the possibilities of informality in terms of management communication and networks (Roberts, 1992) make SMEs less productive. Finally, market-related limitations associated with R&D limitations and strong market competition were presented. Small technology-based firms still have problems of under-investment in R&D projects due to financial limitations;

even just imitating a new invention takes considerable cost (Hyytinen and Toivanen, 2005). Furthermore, SMEs also meet barriers, such as legal environment and unfair market competitions especially firms in less developed countries (Krasniqi, 2007; Mian and Khwaja, 2004). The resources are scarcer in the informal economy due to unfair competition with firms having guanxi, which increases the market barriers for the development of technology-based SMEs.

The last section introduced the policies designed to support technology-based SMEs. The literature suggests that, depending on the target stages of SMEs, the policies can be divided into two groups, which might, to some extent, be overlapped. The policies that target at potential entrepreneurs, entrepreneurs and the infant and early stage of SMEs are entrepreneurship policies, while the policies targeting at established firms are SME policies (Shane, 2003). SME policies include financial policies, innovation policies, human capital policies, networking policies and internationalisation-related policies. It can be found that the main tools of SME policies are subsidies, such as subsidised loan (Becher and Weibert, 1990) and R&D subsidies (Almus and Czarnitzki, 2003). Although policies are designed to support the development of technology-based SMEs, the effect of policies is country and industry-dependent. Thus, the effectiveness of each policy still remains to be tested.

In conclusion, this study aims to fill the gap of understanding the effectiveness of policies. As mentioned previously, policies do not always positively affect the industries; the effects are region and industry-dependent. Thus, this thesis will focus on a region to examine the effectiveness of such policies.

3. The Economic and Legal Context of China

3.1 Introduction

The Chinese economy has experienced golden decades since 1979. China has maintained a growth of about 9% per year in GDP in the past three decades (OECD, 2008; Zhang, 2009). The most important turning point for the development of the Chinese economy was the launch of reform and the opening policies in 1978, which pushed China from planned economy to market economy. During this period, the Chinese government set up numbers of policies to encourage the development of SMEs. For example, removal of institutional barriers and improvement of competitiveness and overall quality (Chen, 2006). Thus, privately owned SMEs enjoyed rapid development and OECD (2006) declared that the output of private sectors in the national total had risen from 28% to 52% between 1998 and 2003. Liu (2007) mentioned that more than 99% of all enterprises in China are SMEs which contributed over 82% of overall employment and at least 60% of GDP. As a result, there is growing interest in the study of SMEs in China.

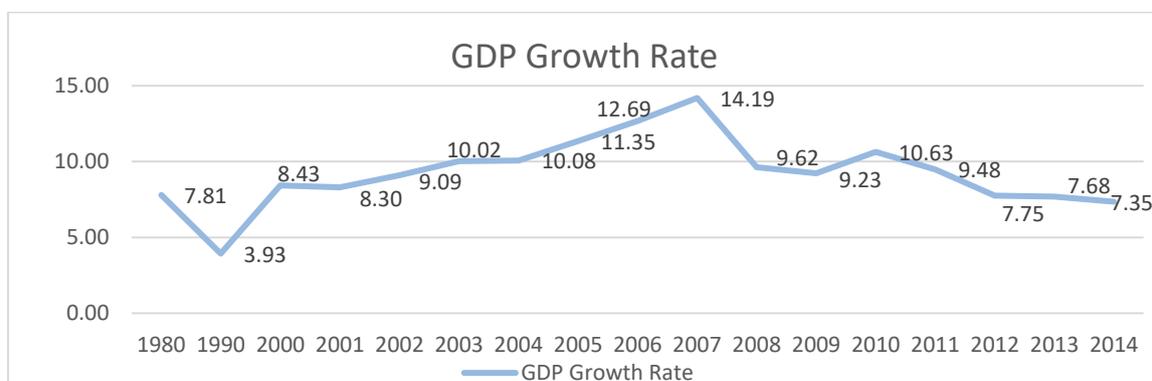
The Chinese economy is growing at a high speed, but it greatly depends on raw materials and energy, which generates serious environmental problems, such as environmental degradation and rising pollution. From the report by Wheeler, Wang, and Dasgupta (2003) on industrial pollution in China, it shows that industrial pollution accounts for 70% of total pollution, including 72% for SO₂, 70% for waste water, 87% for solid waste, and 75% for flue dust. Greener modes of consumption and production seem to be an additional priority for development. Both the party's seventeenth and eighteenth major reports pointed out that it was necessary to push forward strategic economic restructuring and have industrial transforming and upgrading. China's 12th Five Year Plan (2011-2015) gave priority to promoting and enhancing China's capacity for independent innovation, and powerfully supporting the development of technology-based industries (Lewis, 2011). As public attention has been attracted by these industries, it boosts technology-based SMEs and, thus, it is important to study the development and growth of technology-based SMEs.

This chapter uses secondary data to display background information associated with entrepreneurship and technology-based SMEs in China. In so doing, five key sections make up this chapter. The first three sections illustrate the general economic situation, the businesses in international markets and the status of starting and running businesses. Furthermore, the fourth section presents China's political system and the fifth section demonstrates the development phases of SMEs since the launch of reforming and opening policies in 1978. The statistical data are based on the secondary data collected from the World Bank Group, OECD and National Bureau of Statistics of China. The year range in this chapter includes 1980, 1990, 2000 and the years after until 2014.

3.2 General Economic Situation in China

As previously mentioned, China has maintained a growth of about 9% per year in GDP in the past three decades (OECD, 2008; Zhang, 2009). A reduction in poverty levels has provided tremendous opportunities for large numbers of people to escape from extreme poverty, which has taken approximately 500 million people out of poverty. Increasing privately owned SMEs have also enjoyed rapid development since 1978 (Chen, 2006). Figure 3-1 shows the GDP growth rate. It can be seen that GDP growth rate in China reached the highest point (14.19%) in 2007, and had dramatically dropped to 9.6% in the next year. Although GDP growth rate experienced a slight rebound after that, and reached the highest point (10.63%) in 2010, it still suffered a serious drop (OECD, 2012) and reached the lowest point (7.35%) in 15 years in 2014. Although the expanding rate has fallen since 2010, it has maintained almost the same level over the last three years.

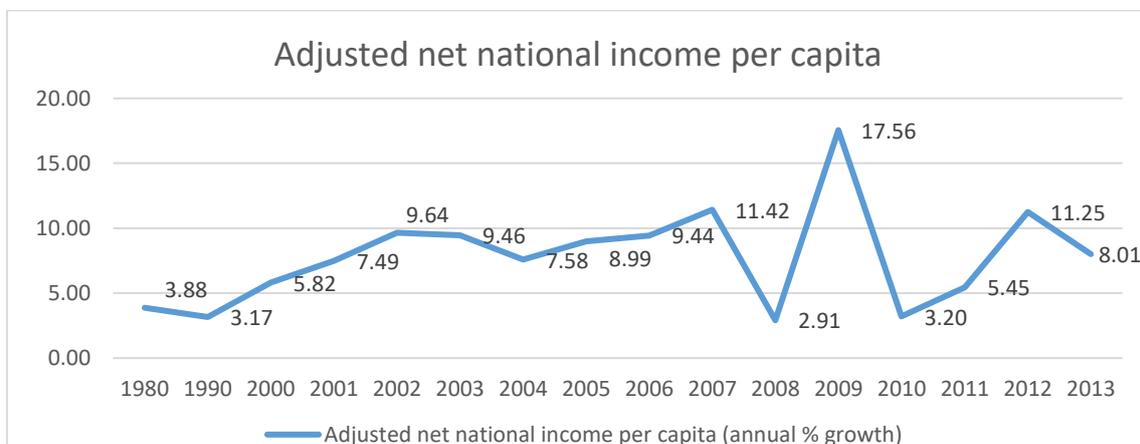
Figure 3-1: GDP Growth



Source: (TheWorldBank, 2014)

Furthermore, the annual growth of adjusted net national income has dramatically fluctuated since 2007, but, during the last three decades, it has maintained a positive growth. In 2008 and 2010, it experienced relative lower growing speeds of 2.91% and 3.20%, respectively. From Figure 3-2, it can be seen that the growth of net national income reached the highest point in 2009, just in between two relative lower points, which might be because of the severe inflation and the subsequent application of tight monetary and fiscal policies. The effects of world economic recession can be seen as another reason for the dramatic drop of net national income per capita in 2009, which will be further explained in the following part.

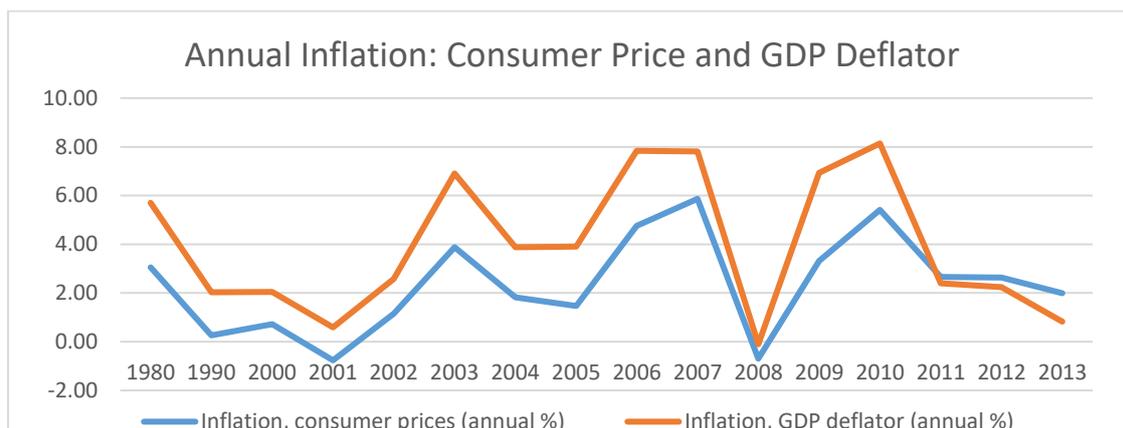
Figure 3-2: Annual Growth of Adjusted New National Income



Source: (The World Bank, 2014)

If comparing Figure 3-2 and Figure 3-3, from 1990 to 2008 the inflation rate and the national income followed an almost similar trajectory, but, from 2009 to 2012, they shared the opposite direction. Indeed, the Chinese government took measures to reduce inflation and cool the economy during this period. In response to inflationary pressures, the Chinese government applied a tight monetary and fiscal policy; both regulated interest rates and the reserve ratios for commercial banks were raised, which reduced the national consumption power. Due to the reduction of economic growth, inflation has been brought under control (OECD, 2013).

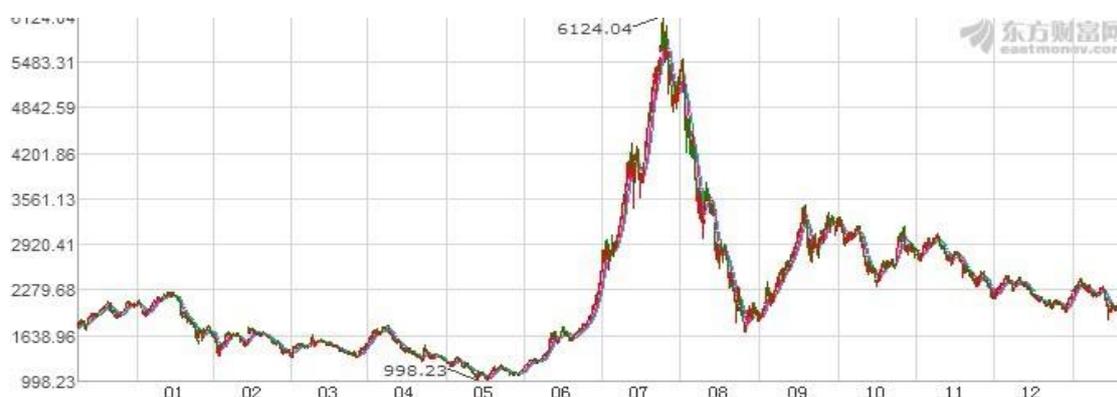
Figure 3-3: Annual Inflation, Consumer Prices



Source: (The World Bank, 2014)

Equities had traditionally been treated as an ideal hedge against inflation, whose real value would be unaffected by inflation. In some cases, inflation could benefit debtors when equities were claimed against leveraged assets (Modigliani and Cohn, 1979). During the serious inflation period, general social awareness of equities increased investment in the stock market in China, and the stock market ushered in its most glorious period in 2007 (see Figure 3-4). However, the stock market has experienced serious turbulence since then. This might be influenced by the world financial crisis in 2008, when the Chinese stock market crashed, resulting in economic earthquakes, which finally led to China's financial crisis in 2009. The American subprime mortgage crisis had caused the most serious economic recessions worldwide in two decades. The U.S. also exhibited a negative economic growth on the balance sheet for two quarters since the third quarter of 2008. The world economy had a 1.2% drop in the fourth quarter compared with the third quarter in 2008, and China was no exception.

Figure 3-4: Index of Stock Price in China

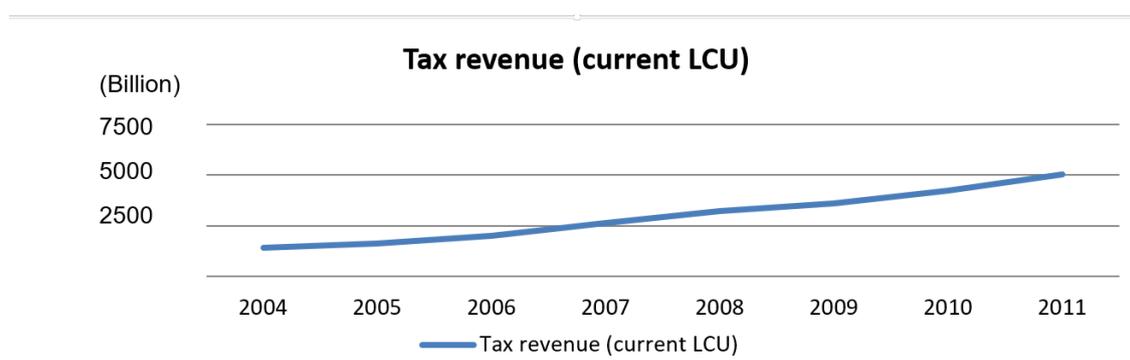


Source: www.eastmoney.com

From the experience of America and Japan, the financial crisis would hit the real estate market. However, the property markets in China still maintained a continuous increase until now. Thus, the Chinese authorities implemented policies to cool the property market as well. For instance, the credit conditions were tightened in the real estate market: people who already owned one property needed to pay more down-payments for buying another. Although authorities enforced measures to cool the property market, it still showed a strong price rise during these years. Moreover, although China was strongly influenced by the world economic recession, it was less affected than developed countries. This might, to some extent, prove that Chinese economic growth is driven by consumption rather than investment (OECD, 2013). During the financial crisis period, the Chinese government adopted several measures to face the economic recession. There was a massive stimulus programme to increase infrastructure investment, mostly financed by the banking system (OECD, 2013).

Compared with several previous indicators, there was limited data about tax revenue. From the World Bank Group Data, it only exhibited from 2004 to 2010. Figure 3-5 below indicates that the tax revenue had continuously increased since 2004, and the tax revenue in 2010 (4,208,581,872,829) had a more than twofold increase compared with that in 2003 (1,159,790,000,000).

Figure 3-5: Tax Revenue

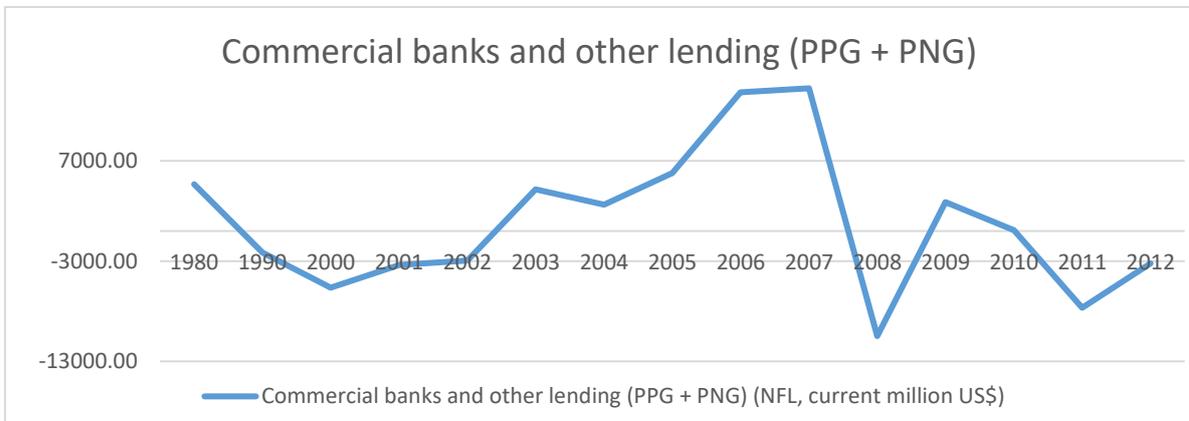


Source: (The World Bank, 2014)

Figure 3-6 shows the commercial banks and other lending institutions had a huge drop in 2011 and fell below zero. It can be seen from Figure 3-6 that the inflation rate decreased after 2010, and stayed at a relatively low position compared with other period, which should increase borrowing. But, from 2010, the lending was

lower than zero, which was because the application of tight monetary policy made it harder to borrow money from banks.

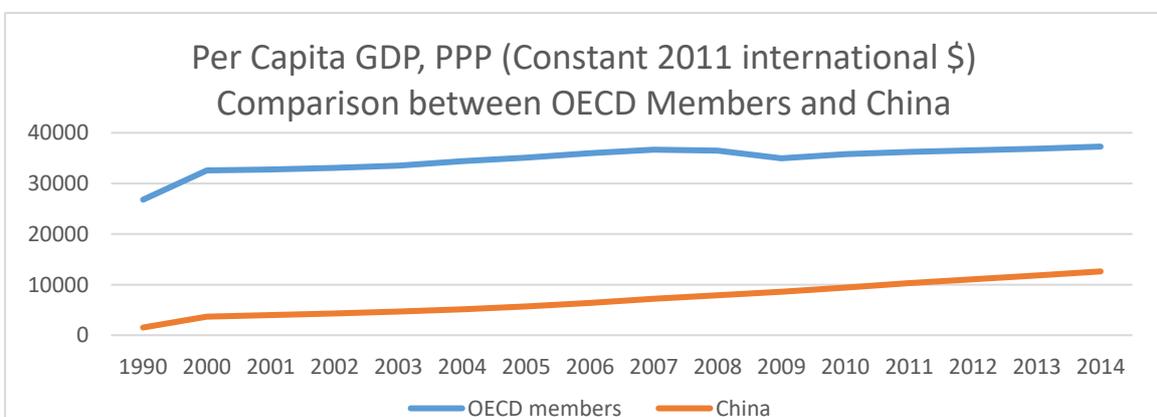
Figure 3-6: Commercial Banks and Other Lending



Source: (The World Bank, 2014)

Although the GDP annual growth and the tax revenue both demonstrated the dynamic economic growth, China is still a developing country, where 98.99 million people still lived below the national poverty line of RMB 2,300 per year (\$1 a day) as of the end of 2012. It should be noticed that the national poverty line is \$1.25 a day according to the World Bank’s global standard. As can be seen, even with a lower standard of poverty line, there was still large number of population living below that. According to the data from the World Bank, despite a continuous increase of income per capita, Chinese per capita GDP is still low compared with the OECD members, per capita GDP of OECD members was two times more than that of China in 2014, which were about 37272.27 US dollars and 12599.18 US dollars, respectively (see Figure 3-7).

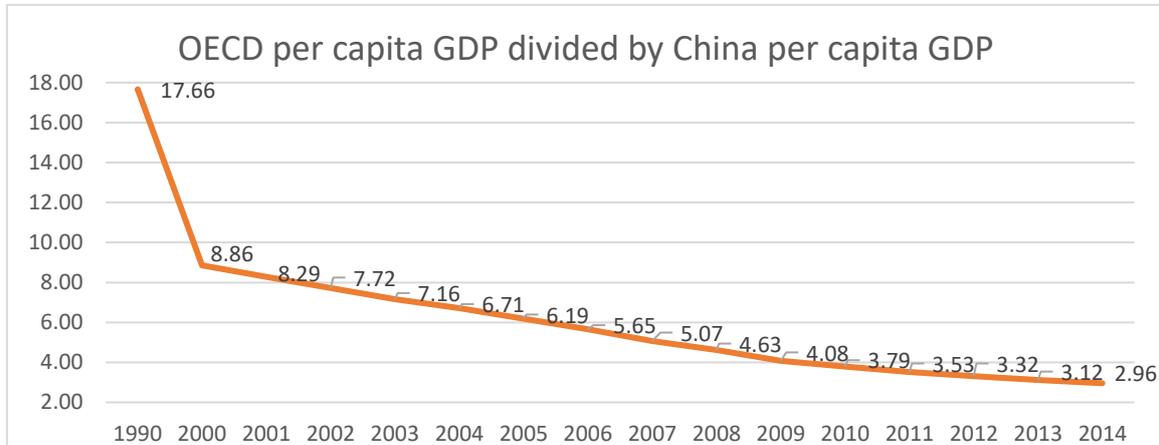
Figure 3-7: Per Capita GDP Comparison between OECD-Average and China



Source: (The World Bank, 2014)

Figure 3-8 shows the ratio of OECD per capita GDP to China per capita GDP. It can be found that the gaps between China and the developed countries has been shortened within the last 35 years.

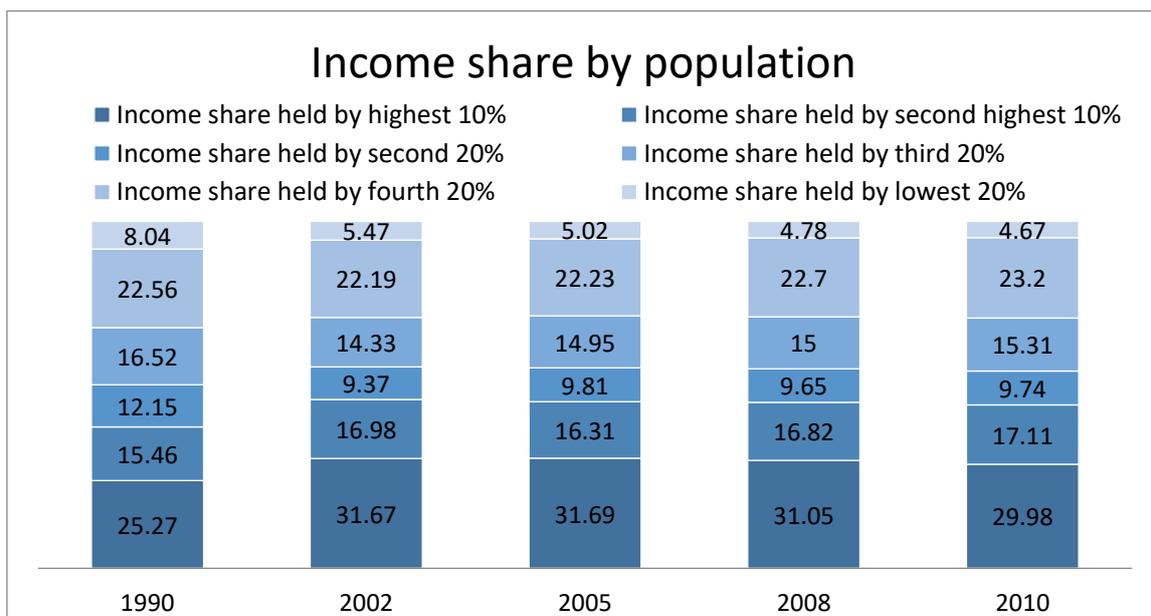
Figure 3-8: OECD per Capita GDP Divided by China per Capita GDP



Source: (The World Bank, 2014)

Figure 3-9 also shows the income inequality between rich and poor. 20% of people share almost half of the income; and the highest 10% of people share around 30% of the income. This situation has not changed for the 10 years since 2002 and the gap between the rich and the poor in China has increased (OECD, 2008).

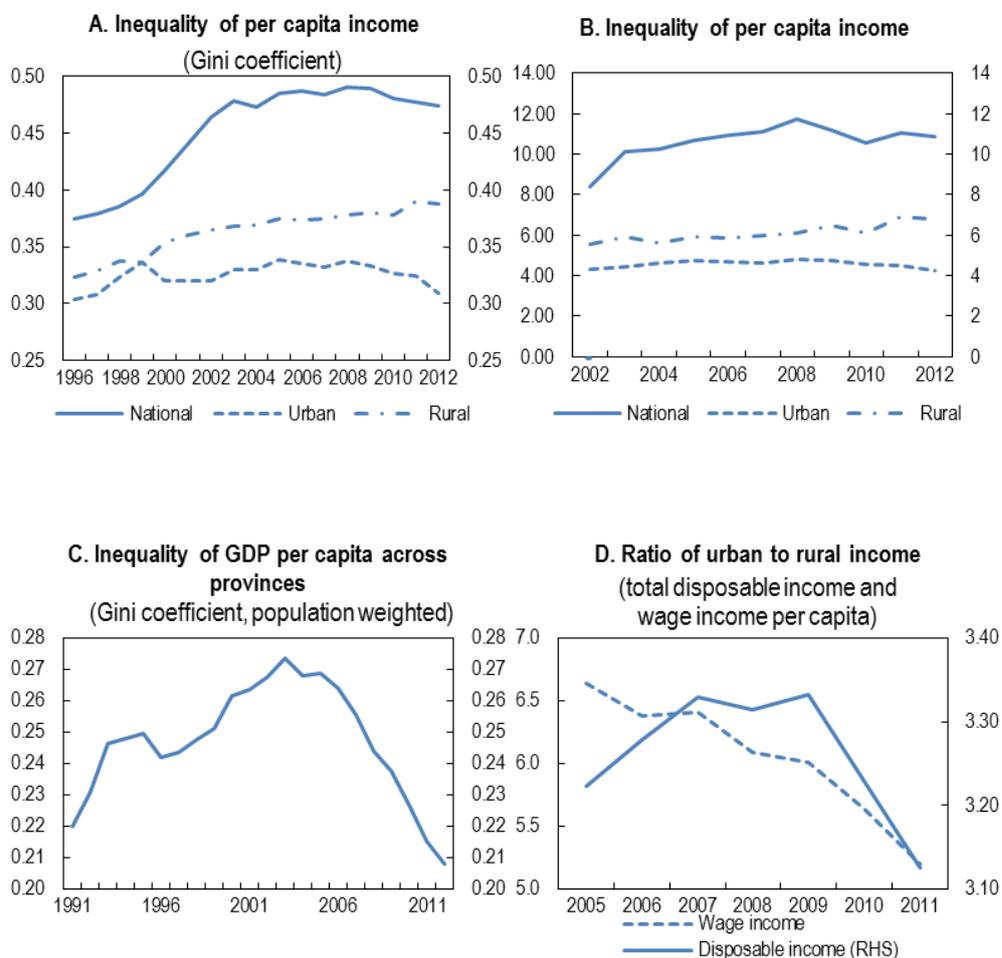
Figure 3-9: Income Share Held by Population



Source: (The World Bank, 2014)

As demonstrated in Figure 3-10, the national inequality of per capita income has been rising since 2002, which is driven by increasing rural inequality; however, it had a decrease in 2010 and the increasing speed has since slowed down. According to OECD's survey, there is still high inequality between rich and poor, but it has started to lessen. All these outcomes reflect the desire of government to construct a sound society welfare system to provide at least a low level of coverage to all citizens. As a result, social expenditure continued to escalate dramatically. National government expenditure on employment, social security, health and other social service increased over 24% per year on average between 2008 and 2012 (OECD, 2013).

Figure 3-10: Inequality between Urban and Rural

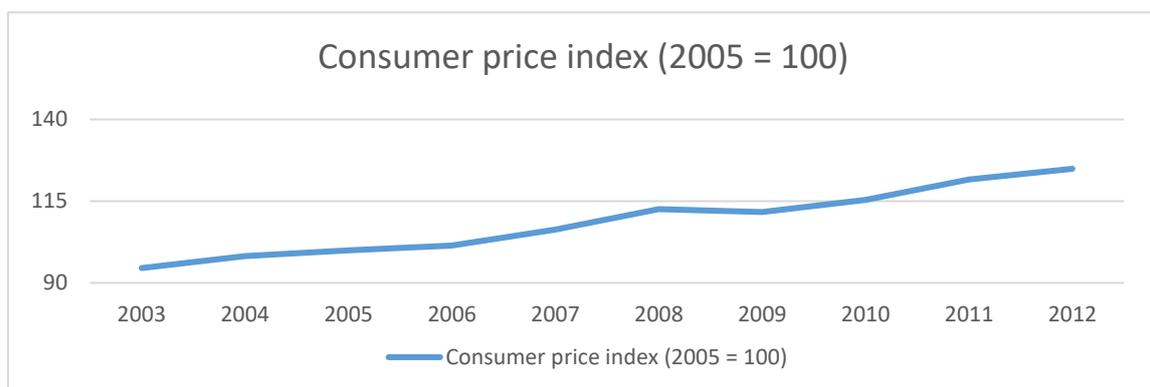


Source: (OECD, 2013)

The consumer price index from the World Bank (see Figure 3-11) shows that the index in 2012 increased about 25% compared with that in 2005. But, in 2009, the

index had a slight drop. There might be two reasons that caused the downswing; one is the government's macro-control, and the other reason might be the American subprime mortgage crisis in 2007 and the Chinese financial crisis in 2009, as previously mentioned. Due to the development of internationalisation, there is stronger relationship between domestic demand and investment and exports. As a result, the world economic environment has greatly impacted Chinese international trade and domestic investment and demand, and Chinese policy makers and scholars have given more attention to international business.

Figure 3-11: Consumer Price Index

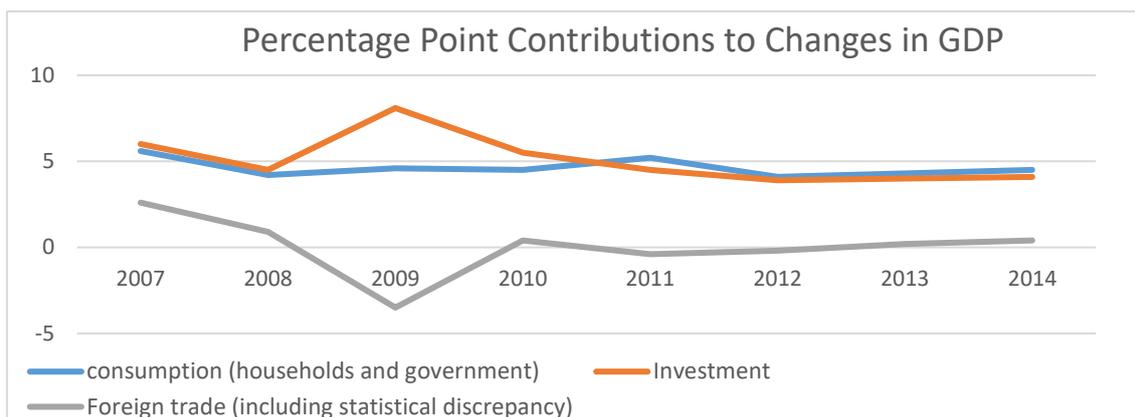


Source: (The World Bank, 2014)

3.3 Businesses in International and Domestic Markets

Figure 3-12 shows that, since 2010, the GDP relied more on domestic consumption than investment and that the economic growth of China was more contributed by domestic markets, while the foreign trade even had negative effects on the changes in GDP. Foreign trade dropped dramatically as the world entered financial crisis, but consumption rose and stabilised at a new, lower level. Indeed, since China joined the WTO in 2001, its share in the world market increased rapidly and approached 10% by 2008. However, the pace of market share slowed down because of the financial crisis, although it rebounded from bottom. Compared with the GDP growth, the growth rate of international market share was still slow. Although the balance sheet of China showed that exports grew well, some evidence supports that it stemmed from domestic inflationary pressures which pulled the export prices. Some cases reflect that weak demand from abroad and net exports made an inappreciable contribution to growth.

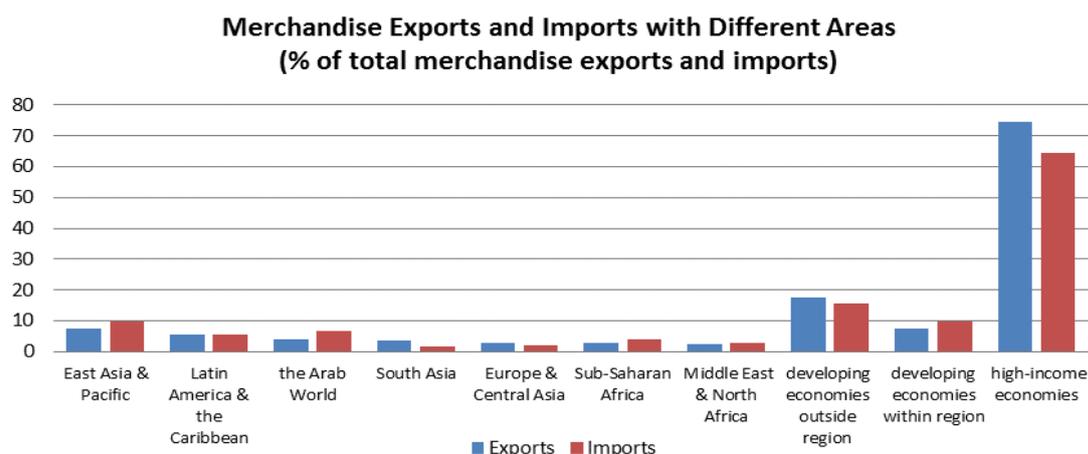
Figure 3-12: Percentage Point Contributions to Changes in GDP



Source: (The World Bank, 2014)

Figure 3-13 shows the merchandise exports and imports of China in different areas in 2011. The international trade has occurred more between China and the countries with high-income economies, which accounts for 74% of the total exports and 64% of imports. However, in the comparison between single areas in developing economies, it can be found that East Asia & Pacific occupies the first position, which is mostly because of the closer geographical distance. Latin America & the Caribbean and the Arab World take the second and third places. China has the least business connections with the Middle East & North Africa and only accounts for about 2.2% of total exports and imports.

Figure 3-13: Merchandise Exports and Imports with Different Areas

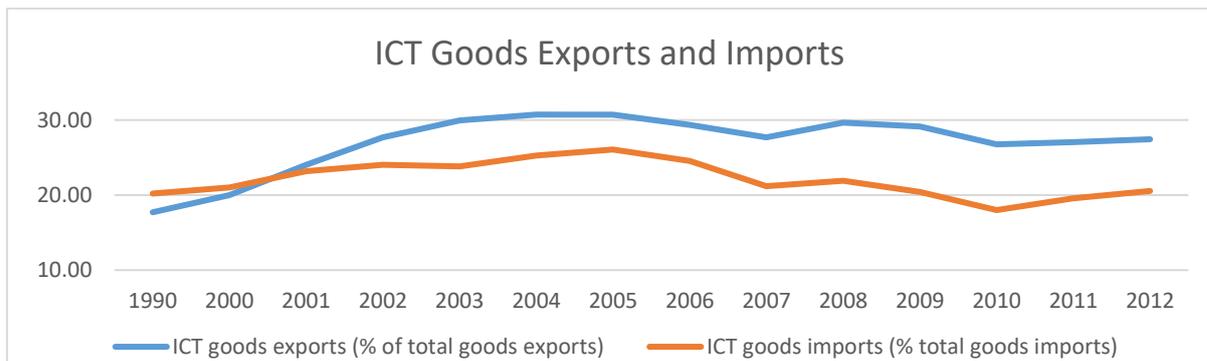


Source: (The World Bank, 2014)

The export of primary resources in China still accounts for a high proportion. The expansion of exports, to a large extent, depends on low-wage manufacturing that utilises imported components. Surprisingly, ICT (Information and Communication

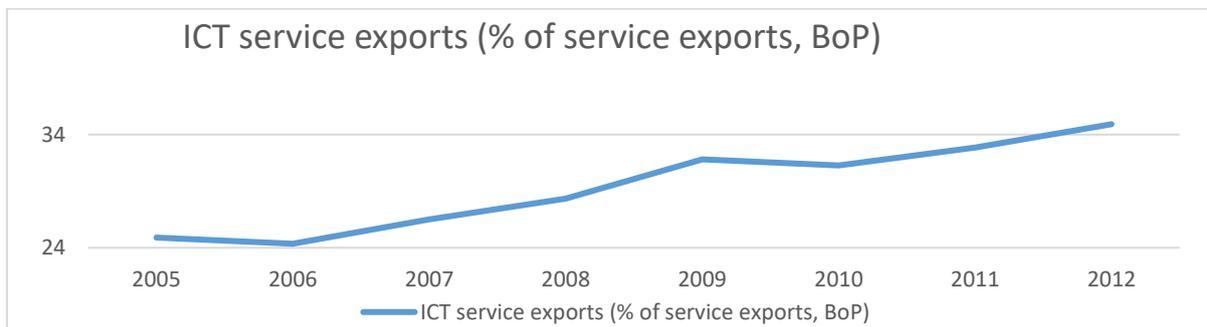
Technology) goods exports and imports of total goods exports and imports were not in a low proportion, accounting for about 27% and 21% in 2012, respectively. However, the proportion dropped after 2005 and experienced a rebound from 2010 (see Figure 3-14). It can be interpreted into two ways. On one hand, with the increase of overall goods exports and imports, the ICT goods exports and imports proportion might increase, but did not increase as much as the overall goods exports and imports. On the other hand, because of the improvement of the overall technology levels in China, the ICT goods may, to some extent, catch up with the average technology levels of the world, which may lessen the technology barrier of Chinese technology-based firms. On the contrary, the proportion of ICT service exports of total service exports has shown a marked increase since 2006, see Figure 3-15.

Figure 3-14: ICT Goods Exports and Imports



Source: (The World Bank, 2014)

Figure 3-15: ICT Service Exports

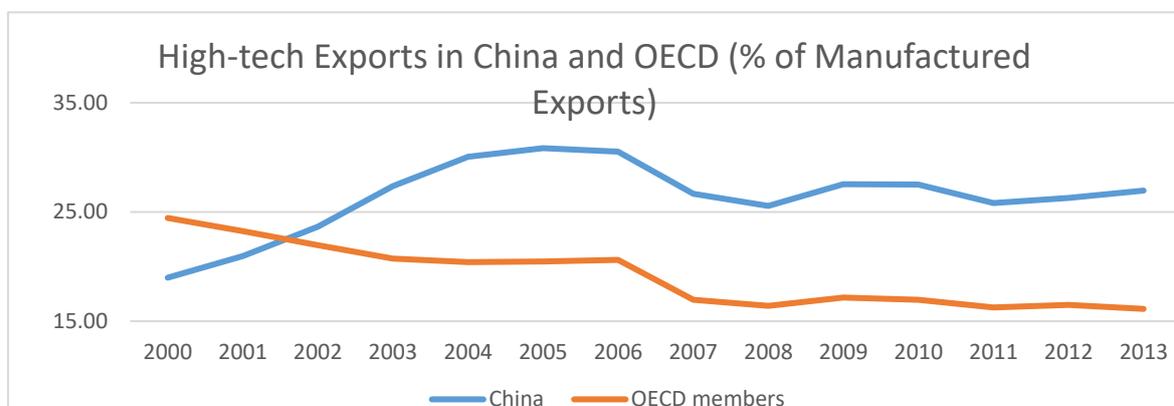


Source: (The World Bank, 2014)

In the international arena, lack of products with core technology has limited foreign inflows. Nevertheless, as a member of the BRIICS, it has been reported that China had a continuous increase in high-tech manufacturing since 1999

(OECD, 2011; Zhang, 2009). The share of China's high-tech exports had significantly increased from 18.98% in 2000 to 30.84% in 2005, and experienced a slight drop till 2008, and it remained in a relatively stable place until 2013. Figure 3-16 below shows the percentage of high-tech exports to manufactured exports in China and OECD. It can be found that China became more reliant on high-tech exports after 2002 compared with OECD countries. However, the facts should be considered that most high-technology exports originated from foreign-owned firms; more than that, high-tech industries are also primary controlled by foreign investors (OECD, 2008).

Figure 3-16: High-tech Exports in China and OECD

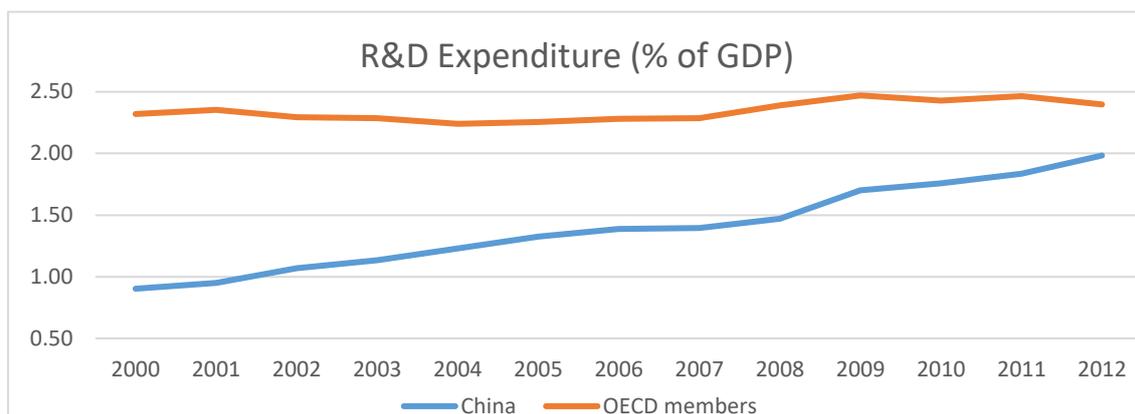


Source: (The World Bank, 2014)

In the domestic market, Chinese enterprises also highly rely on capital and resources rather than on innovation and knowledge. Less R&D ability and fewer highly educated fulltime employees led to less innovative capacity (Zhang, 2009).

Figure 3-17 shows the comparison of R&D expenditure (% of GDP) between China and OECD countries. It can be found that the percentage of R&D expenditure to GDP was still lower than that of OECD countries, but the gap became smaller after 2000. More efficiency and knowledge used by enterprises has been recognised as China's long-term prosperity (Zhang, 2009), and, the statistical data show it was actually doing so; the expenditure on R&D increased yearly and was about 1.98% of GDP in 2012.

Figure 3-17: R&D Expenditure (% of GDP)



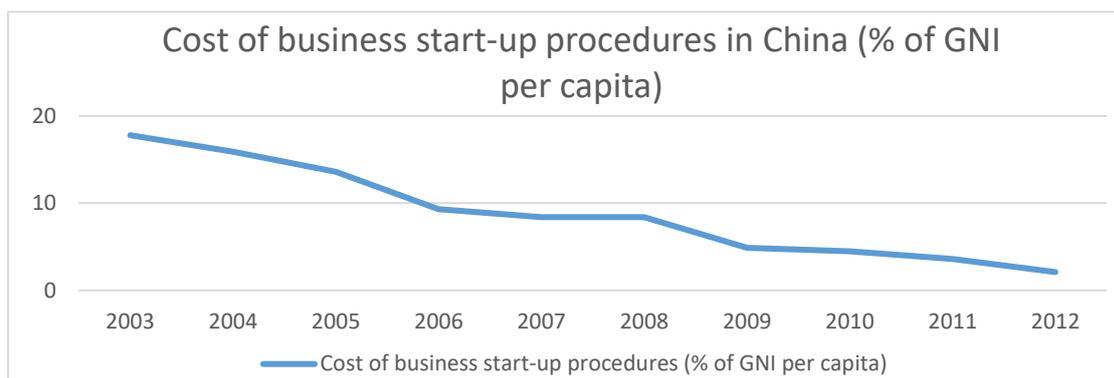
Source: (The World Bank, 2014)

3.4 Starting and Running a New Business

As mentioned above, China still remains a developing country with a considerable amount of population living below the national poverty line. It is necessary to boost both economy and employment. Chapter Two emphasised the importance of public policies for the development of SMEs and thus have a positive influence on the economic and employment growth. The main methods include simplifying procedures to start a business, subsidising new businesses, training and education and credit guarantee according to the World Bank Data.

All start-up procedures have been made easier over the last 10 years. For example, the cost of business start-up procedures (Figure 3-18) declined from 17.8% of Gross National Income (GNI) per capita in 2003 to 2.1% of GNI per capita in 2012. Moreover, time required to start a business (Figure 3-19) also experienced a decrease after 2003, from 46 days to 33 days in 2012; it benefited to strengthen the business operating environment (OECD, 2013), as well as entrepreneurship environment, because it might encourage more potential entrepreneurs to start their own businesses.

Figure 3-18: Cost of Business Start-up Procedures



Source: (The World Bank, 2014)

Figure 3-19: Time Required to Start a Business

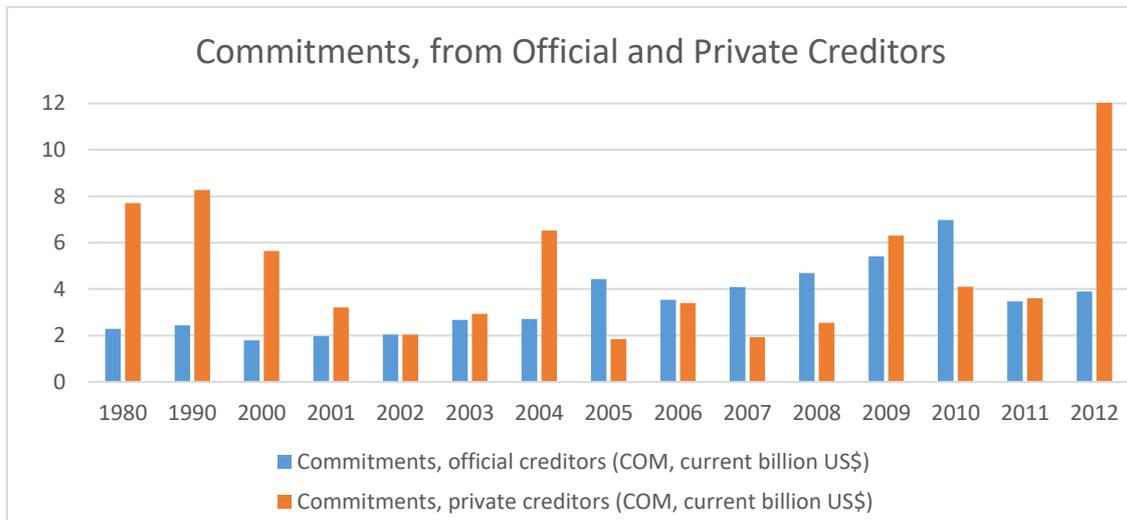


Source: (The World Bank, 2014)

The commitments from both official and private creditors rose within the last decade from 2003, with slight fluctuations (see Figure 3-20). Both loans and credit from international organisations and governments could be classified as debt from official creditors, such as loans from the World Bank, intergovernmental agencies, loans from governments and their agencies and direct loans from official export credit agencies. Furthermore, debt from private sectors include publicly or privately issued bonds, commercial bank loans from private banks and other private financial institutions; and other private credits from manufacturers, exporters, and bank credits covered by the guarantee of an export credit agency. From this figure, it can be seen that the commitments from private creditors had dramatically increased in 2012, becoming four times those from official creditors. On the other hand, it shows that the private financial market is more mature and,

from another perspective, explains that public policies have motives to drive the development of private credit markets and achieve a certain level of success.

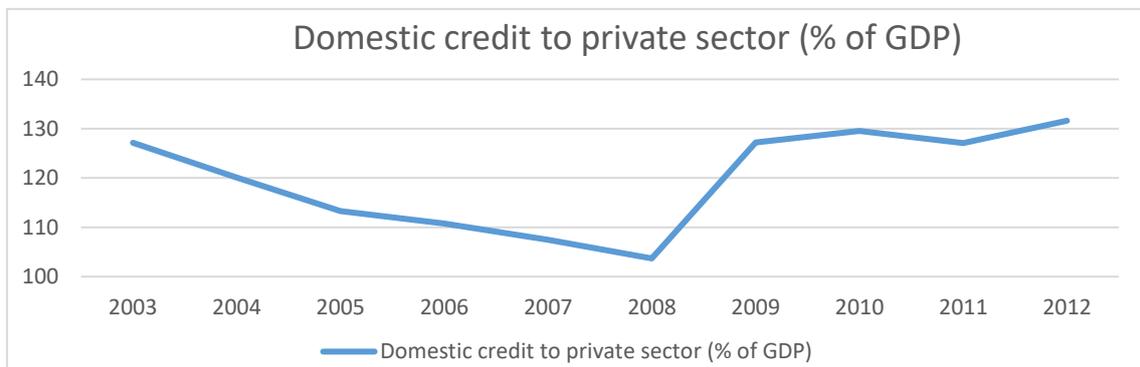
Figure 3-20: Commitments, from Official and Private Creditors



Source: (The World Bank, 2014)

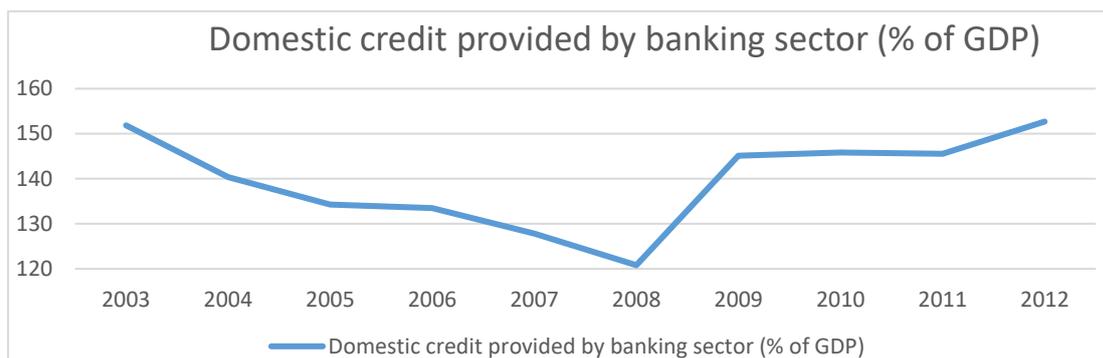
The rise of commitments likely had a positive influence on the increase of investments. In addition, as seen in Figure 3-21, domestic credit to private sectors exhibited a huge increase after 2008, although there was a continuous decrease from 2003 to 2008, and, in 2011, it was 11% more than in 2003. Domestic credit provided by the banking sector showed a similar trend to domestic credit to private sectors. This might be caused by the application of relaxed policies on credit to alleviate the financial crisis in 2009 (see Figure 3-22).

Figure 3-21: Domestic Credit to Private Sector (% of GDP)



Source: (The World Bank, 2014)

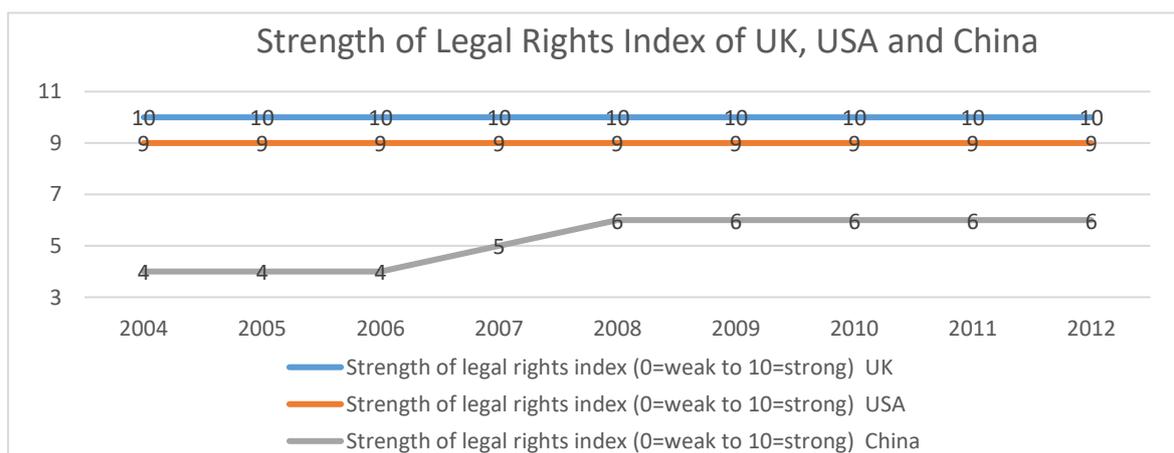
Figure 3-22: Domestic Credit Provided by Banking Sector (% of GDP)



Source: (The World Bank, 2014)

According to the definition given by the World Bank group, the strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and, thus, facilitate lending. The higher scores mean that the laws are better designed to expand access to credit. From the comparison between China, the UK and the U.S., it can be observed that the strength of the UK’s legal rights index is the highest, while, although China has a slight improvement, it still shows great difference with the U.S. and the UK. Thus, China still has to strive for setting up relevant laws and regulations (see Figure 3-23).

Figure 3-23: Strength of Legal Rights Index of the UK, the USA and China

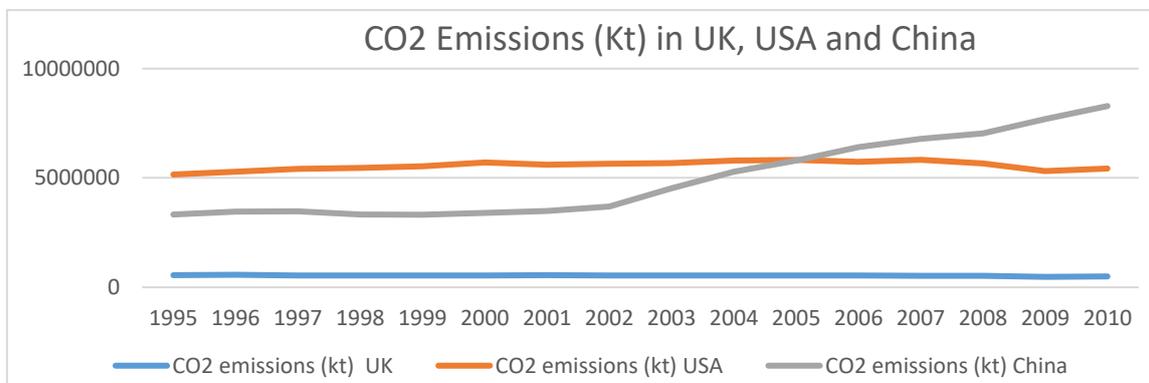


Source: (The World Bank, 2014)

Indeed, the Chinese economy grows at a high speed, but it greatly depends on raw materials and energy (Liu and Diamond, 2005). The industrialisation and urbanisation leads to environmental degradation and rising pollution and, in the

long-term, would harm human health. As incomes have risen, the authorities have been paying more attention on the environmental stress brought by rapid economic expansion (OECD, 2013). In Figure 3-24, it can be seen that the CO2 emissions in the UK and the U.S. have maintained at a certain level for 15 years from 1995. In contrast, the CO2 emissions in China have experienced a dramatic increase since 2002, and were above American's CO2 emissions in 2005. Thus, the issues of ecological environment bring another challenge for China's further economic development (OECD, 2008). Greener modes of consumption and production seem to be an additional priority for development.

Figure 3-24: CO2 emissions in the UK, the USA and China



Source: (The World Bank, 2014)

A further challenge that ensures sustainability and comprehensive in terms of economic, social and environmental development has been recognised. As a determinant of promoting the sustainability of economic growth and social development in China since the early 21st century, there are increasing concerns about the innovativeness of enterprises.

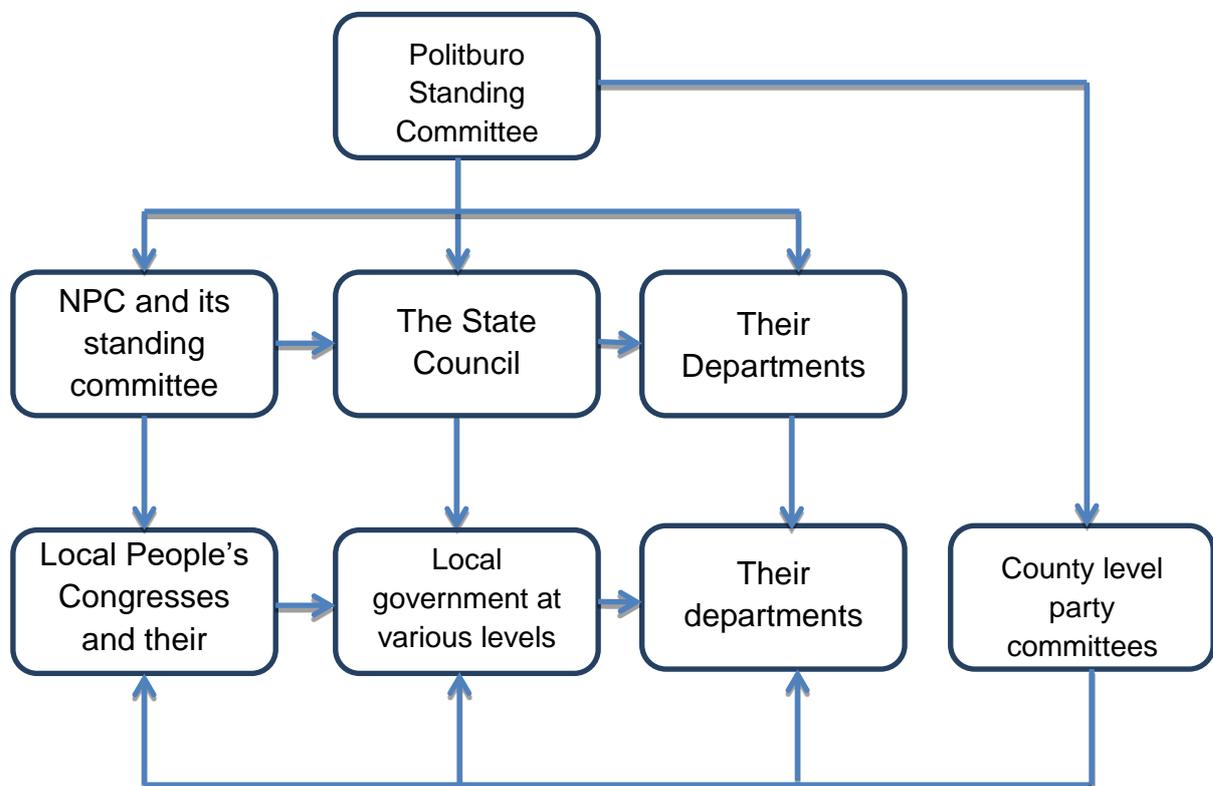
3.5 China's Political System

The Chinese political system is centrally-controlled regional decentralisation (Xu, 2011). This means that the national government's control is substantial in that the Chinese political and personnel governance has been highly centralised. But, on the other hand, the regional economies are relatively self-contained. The sub-national government has the right to initiate, negotiate, implement, divert and resist reforms, policies, rules and laws under the supervision of central government (Xu, 2011). However, the feature is fundamentally different to

federalism, where the governors or mayors are elected and they represent their constituents. The officials of the sub-national government are appointed from above, and the promotion and movement of the officials are the main means for national government to induce regional officials to follow the central government’s policies (Xu, 2011). Saich (2001) argued that local governments have been accorded greater control over local economic activity and the redistribution of economic rewards. It is highlighted that local state dominates local society, and the local state has the power to decide its strategies to develop the local economies.

The Chinese Communist Party dominates state and society in China, as shown in Figure 3-25. The Party commend the policies and day-to-day administration to the institutions of the State, including the State Council, which is the head of those institutions, other departments and layers of “local government at various levels” as well as local government departments. The county level party in every level of administration is concurrently held by the top State officials, to ensure Party control. In other word, it confirms “the Party’s absolute and unified leadership”(Lawrence & Martin, 2012:28).

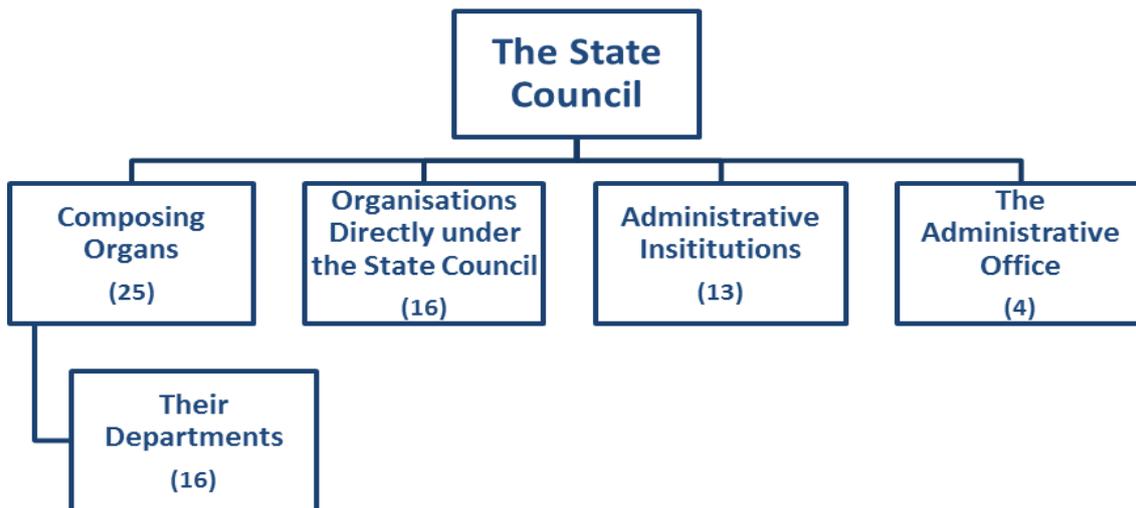
Figure 3-25: The Relationship between National and Local Governments



Source: Adapted from State Department Website (State Council, 2014)

The state is the second major institution of the Chinese political structure and the State Council is the locus of power in the state system (Lawrence and Martin, 2012). The state system manages the economy on a day-to-day basis. Twenty-five organs compose the State Council and 16 organisations are directly under control of the State Council. Under the State Council, there are 13 administrative institutions and four administrative offices, as shown in Figure 3-26.

Figure 3-26: The Framework of the State Council



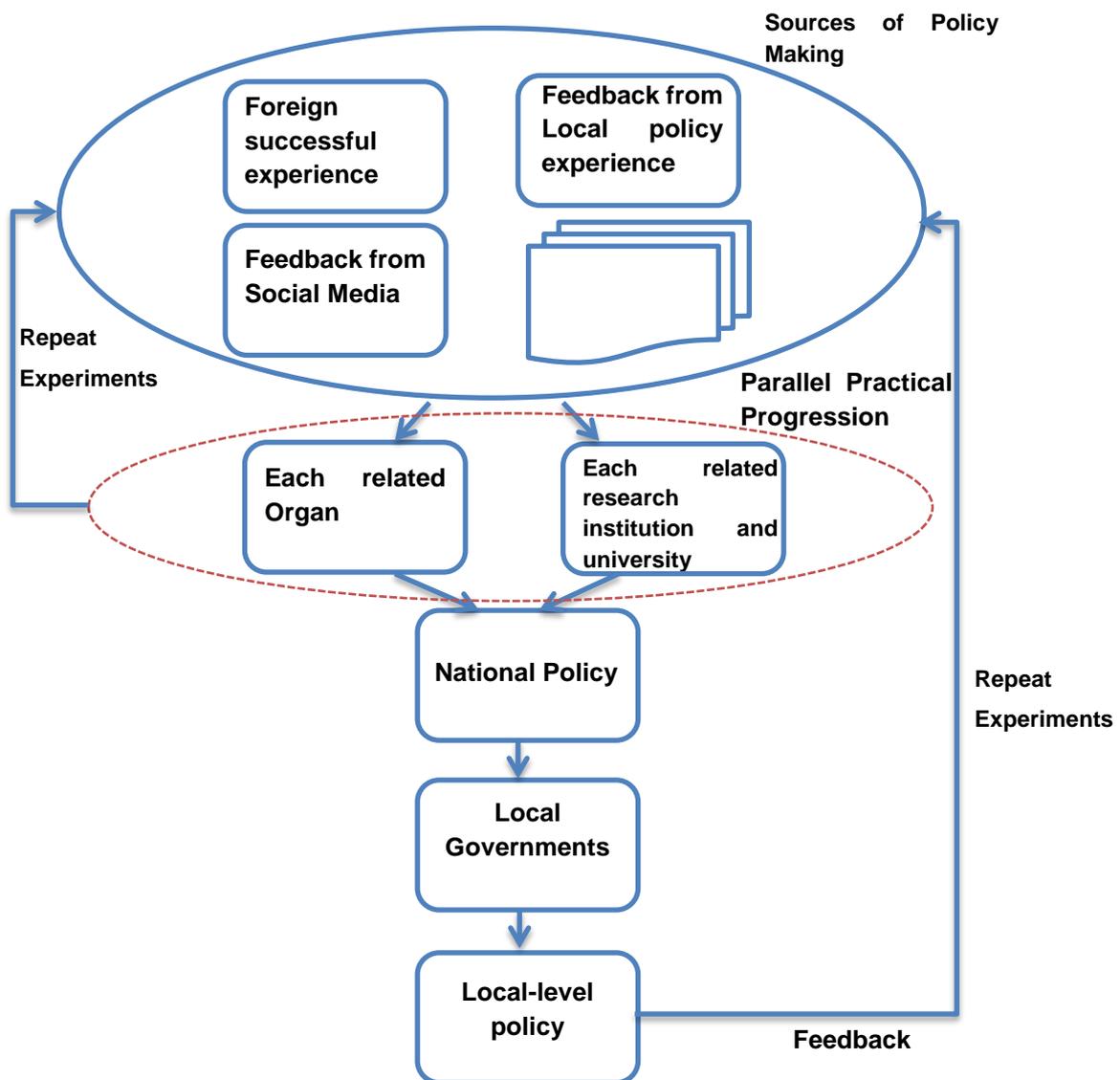
Source: Adapted from State Council Website (State Council, 2014)

Chinese policy is based on the method of parallel researches (Fan and Woo, 2005) and repeat experiments (Heilmann, 2008). Parallel practice progression in Fan and Woo's (2005) research was more focused on the practice level, which means that all the reform policies are parallel practice rather than sequentially one after the other. This reflects the coherence between different institutions. The authors assumed that, under a certain overall aim, optimising and unifying the policy reform, each institution could coordinate with another. In this thesis, the author will also use "parallel progress" to describe the policies, but will focus on the level of policy making. Figure 3-27 illustrates the policy making progress, which is summarised from the information from documents released online and policy interpretation. Each related organ and each related research institution and university may study on the policy parallel. They will then gather their policy options and, eventually, set an overall policy. To do so, the sources of their policy

making can be successful foreign policy cases, or feedback from local policy experience or social media. This process is called parallel research.

Moreover, the repeat experiments can also be thought as a major method for Chinese policy making (Heilmann, 2008). This process is also shown in Figure 3-27. It can happen at either the parallel research stage or local-level policy phase. Specifically, before issuing the national policies, the organs will sometimes do a pilot project in some cities and adjust the policy options based on the result of the test. In addition, once the policies have been popularised to local-governments, the feedback will be used as sources of advanced policy making. As a result, the policies can be repeat tested and adjusted at any time.

Figure 3-27: Policy Making Process



Source: Adapted from Fan and Woo (2005) and Heilmann (2008)

3.6 Development Phase of SMEs

Chinese SMEs have gone through three development phases since the launch of the reform and opening policies in 1978. The first phase was from 1978 to 1992, when government encouraged expanding the numbers and scale of SMEs. It arose from the government's support of collectively-owned, self-employed and township enterprises. The second phase was from 1992 to 2002. During this period, the policy makers focused on the reform of state-owned SMEs and development of non-public sectors. Different measures, such as merger and acquisition (M&A), joint partnership, restructuring and sell-off have been done by government and gradually reduced state ownership in state-owned enterprises (SOE). Simultaneously, the privately owned SMEs enjoyed rapid development because of the establishment of a socialist market economy. All these measures have advanced the reforms and development of SMEs in China. In June 2002, the Chinese government introduced a new law named the SME Promotion Law which opened up a new era, which is the third phase (Chen, 2006). The tasks of Promotion Law are to improve policies and measures for the development of SMEs, removal of institutional barriers, establishment of fair competition environment, and to promote innovations and upgrading, industrial structure optimisation and improvement of competitiveness and overall quality (Chen, 2006).

Major state-owned enterprises (SOEs) have rapidly transferred into small and medium non-SOEs within the third phase (Chen, 2006; Liu, 2007). Structural transformation, in terms of ownership, has been significantly obvious in the industrial sector where the private enterprises accounted for more than half of value added in 2003 according to an OECD analysis (OECD, 2008). The "open door" policy has helped China make good use of its competitive advantages. More than that, it has also gradually increased competition in both product and service markets, which has led to the production of cheaper, better quality and variety of goods (OECD, 2008).

In contemporary world history, China's re-emergence into the international arena and becoming a major power since the establishment of the reform and opening policies could be treated as one of the most significant developments (OECD, 2008). As SMEs play an increasingly important role in China's economy, Chinese

policy makers and scholars are investing more energy and effort to improve the market economy.

3.7 Conclusion

It can be seen that China experienced a rapid economic growth during the last two decades, and that the GDP growth speed has slowed down since 2011, but still remains around 7%. When considering per capita GDP, the gaps between China and developed economies have narrowed during the last 35 years, but China is still far behind. Furthermore, the gaps between rural and urban areas became wider during the last 15 years.

Furthermore, China's share of international market has increased rapidly since joining the WTO in 2001, although the speed has slowed down because of the worldwide recession. However, this did not strongly affect China's economy, which suggests that the China's economy relies more on domestic consumption rather than international businesses.

It is argued that enterprises in the domestic market still highly rely on capital and resources rather than innovation and knowledge. The R&D expenditure is still low compared with developed economies. Furthermore, the costs and time required to start businesses both dramatically decreased, which suggests that the entrepreneurial environment is much better than previously. Policy makers are making efforts to alleviate the start-up barriers.

Moreover, the Chinese political system is central-controlled regional decentralisation. Thus, the local government has the right to initiate its own policies under the supervision of central government. The Communist Party dominates state and society, and commends the policies and day-to-day administration to the institutions of the State, including the local government and its departments.

Finally, there has been an introduction of SMEs development in China. The development of the SME sector has experienced three dramatic revolutions since the launch of the reform and opening policies in 1978. Increasingly supportive policies have been released to support SMEs since then.

4. Methodology

4.1 Introduction

The previous chapters introduced the overall context of China, the main themes from the literature and highlighted the gaps in terms of research. This is reflected in the limited nature and amount of research conducted on technology-based SMEs in Beijing relating to the supportive policies. As indicated in Section 2.3.4, the criteria of technology-based SMEs are very restrictive and they are relatively difficult for SMEs to achieve, especially for young SMEs. Thus, when selecting research objectives, the author focused on the range of industries prescribed in the Administrative Measures for Recognition of High and New-Technology Enterprises (HNTE). The firms need to also meet the criteria of SMEs in China. Other criteria, such as annual revenue and R&D expenses were not counted as screening conditions. This chapter aims to consider the methods of past studies which have influenced the field of entrepreneurship, SMEs, and policies thus far. With this information, the researcher seeks to make a case for the approach and methods deployed in this study.

Specifically, in Chapter Two, it was demonstrated that current studies under the policies umbrella provide a limited view regarding entrepreneurship and technology-based SMEs. It is argued that recent SMEs trends increasingly value knowledge and those knowledge-based SMEs have been prevailing, and it is suggested they will continue to be an important element of a knowledge-based economy (Audretsch, 2004; Braunerhjelm, Acs, Audretsch & Carlsson, 2010). The knowledge input eventually generates process or product innovation, which furthers the overall economic growth (Coad et al., 2014). This research has specifically targeted technology-based SMEs which combined the characteristics of both knowledge-based entrepreneurship and SMEs. Because of the nature of technology-based SMEs, they experience more disadvantages than their counterparts (North et al., 2001), such as non-tech SMEs and large firms. The researcher argues that there is a need for a deeper look at whether government support can, to a certain degree, eliminate the disadvantages faced by technology-based SMEs by building a more entrepreneurial-friendly economy through entrepreneurship policies and providing specific external supports for

developing technology-based SMEs through SME policies. Furthermore, science parks play a significant role in promoting economic development, technological upgrades and local benefits (Massey et al, 1992). They especially have positive influences on innovation output (Yang, 2009). However, there is a lack of theoretical or empirical evidence on the firm-level decision to locate on a science park (Leyden, Link & Siegel, 2008).

The main research aim of the study is to examine the effectiveness of government policies on technology-based SMEs and entrepreneurship in Beijing, China. Considering the knowledge gaps identified in the literature review, the main objectives, research goals and associated methods are summarised in Table 4-1.

Table 4-1: Objectives and Methods

Research Aim		
To examine the effectiveness of government policies on technology-based SMEs and entrepreneurship in Beijing, China		
Objectives	Research Questions	Methods
1) To identify the influential factors of entrepreneurship	i) How are policies implemented from policy documents?	Document Analysis/Interviews
	ii) How do external and internal influential factors affect entrepreneurial activities?	Interviews/Questionnaires
2) To identify the characteristics of technology-based SMEs	i) What are the limitations of technology-based SMEs?	Interviews/Questionnaires
	ii) Do state-owned SMEs and privately owned SMEs have different advantages and barriers?	Questionnaires
3) To examine the effectiveness of policies targeted at technology-based SMEs and entrepreneurship	i) How effective are those policies from entrepreneurs' perspectives?	Interviews/Questionnaires
	ii) Do the policies affect the views of entrepreneurs towards the research questions 1(ii) and 2(i)?	Questionnaires
4) To explore the differences between on-park and off-park technology-based SMEs	i) What are the differences between on-park firms and off-park firms?	Interviews/Questionnaires
	ii) Do the legal forms (state-owned and privately owned) affect the results of research question 4(i)?	Questionnaires

Source: Author

The data used in this research were collected between February 2014 and October 2014 in Beijing, China. Four categories of interviewees participated in the interviews and these were followed with a survey that involved 96 valid questionnaires. As can be seen, this research adopted a mixed methods case study to investigate the existence and meanings of the studied phenomenon.

The philosophical assumptions underlying every study are important for clarifying research design and methods, which can be used to conduct a good investigation (Easterby-Smith, Thorpe & Jackson, 2012). The philosophy that a researcher adopts has significant impact, not only on what the researcher does, but how the researcher understands what it is they are investigating (Johnson and Clark, 2006). Awareness of the philosophical assumptions can increase the quality of any study; thus this section will clarify the author's belief of philosophical understanding.

Fundamentally, "ontology" refers to the assumptions as to whether "reality" is of an "objective" nature external to the individual, and "epistemology" refers to how one might begin to understand the world - "the reality" (Burrell and Morgan, 1979). This research is to understand the social phenomena, which can be interpreted by people as social actors. The reality could be interpreted in different ways through social conditioning (Saunders, Saunders, Lewis & Thornhill, 2011). Thus, in social science, it is generally maintained that reality is socially constructed and often has a subjective epistemological standing. In this sense, this research reflects the interpretive view of ontology and epistemology (Burrell and Morgan, 1979; Saunders et al., 2011). The author tried to understand the social world at the level of subjective experience, and was concerned to understand the world as it is. To do so, the author entered the social world of the research subjects and tried to understand their world from their point of view.

This chapter is divided into three principal sections. Firstly it will illustrate the focus on the chosen methods of data collection and the reasons for such an approach. In brief, this research will take a mixed methods case study approach, consisting of document analysis, semi-structured interviews and a questionnaire survey. The next section details the chosen methods for analysing the data. And finally, the research will conclude the chapter with a reflection on the ethical consideration of this study.

4.2 Case Study Approach

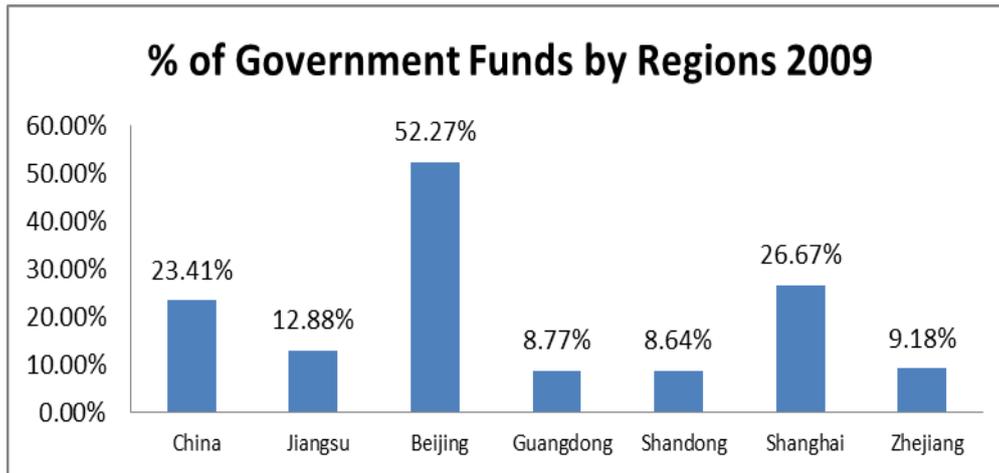
This research employs a case study approach, which uses a mixed method with qualitative and quantitative methods. First, the rationale of the research area, Beijing, will be identified, followed with an overall introduction of the research methods. Finally, the research samples and the research schedule will be introduced.

4.2.1 Choosing a Research Area

China has 14 cities of over five million people; some of them have stronger annual GDP growth than Beijing. However, Beijing was explicitly chosen as the case study region due to the fact that Beijing is the capital of China and the regulations and policies released in Beijing can be seen as the most matured policies nationwide. As previously introduced in Section 3.5, the Chinese political system is a centrally-controlled regional decentralisation, and Chinese policy design is based on the method of parallel research and repeat experiments. However, Beijing is mostly not part of an experimental city. In other words, the policies and regulations adopted in Beijing can be seen as “flawless” policies compared with other cities, because the policies have been repeatedly tested in these other cities.

In addition, from Figure 4-1, it can be seen that the proportion of government funds in total funds stands in first place compared with the six main districts of technology-based firms. The total funds here include self-raised funds, government funds, foreign funds and other funds that are necessary for starting and developing businesses. More than 50% of government funds are involved in business operations, which is more than double the national average. From another aspect we can say that firms in Beijing are heavily intervened by government. Since the aim of this research is concerned with the effects of government interventions, Beijing can be considered as the most representative city for this research.

Figure 4-1: % of Government Funds by Regions, 2009



Source: China Statistical Yearbook on Science and Technology (2010)

It seems there is conflict to some extent in that policies in Beijing are representative in China and the fact that firms in Beijing receive the highest proportion of government funds. However, it should be noted that each local government in China has the right to set up its own policies, in terms of supportive focuses, because of the nature of the Chinese political system, as long as the supports are considered as useful for the development of local economy. In addition, the policies implemented in Beijing are mostly already tested and confirmed as valid in other cities, which does not necessarily relate to the exact amount of government capital involved. It just shows that government financial supports are necessary for the development of firms, and that the Beijing government has the right to set how much money they are going to spend to support technology-based firms. Thus, Beijing is chosen as the research area of this study.

4.2.2 Research Methods

To realise the aims and objectives, this research employs a case study approach. A case study approach has been adopted due to the infant and exploratory nature of technology-based firms in Beijing, China. A case study is a research strategy which employs empirical investigations of real life phenomena in a particular contemporary (Robson, 2002; Yin, 2014). More specifically, Yin (2014) pointed out that a case study approach is suitable to a study that investigates a particular type of organisation where the investigator has no control over the events.

A case study may be generally recognised as one choice of qualitative research, but actually it can go beyond being a type of qualitative research (Creswell, 2007). A mixed method with both quantitative and qualitative methods can also be used in a case study research (Yin, 2014). Mixed methods utilise the strength of both quantitative and qualitative research. Johnson, Onwuegbuzie, and Turner (2007) suggested that mixed research was positioned between quantitative research and qualitative research, which respects the advantages of both research methods while also seeking to avoid many research problems of interest. Bouchard (1976) also declared that the result stemming from two or more methods can enhance the validity of the result. Webb, Campbell, Schwartz, and Sechrest (1999) stated that, when a proposition has been supported by two or more independent measurement processes, the possibilities of uncertainty are greatly declined. Thus, recently, mixed methods that combine qualitative and quantitative approaches have gained popularity (Creswell, 2013).

Webb, Campbell, Schwartz, and Sechrest (1966) first coined the term triangulation and Denzin (1970) broadly defined triangulation as a combination of methodologies for studying on the same phenomenon. Denzin (1970) was the first to outline how to triangulate methods. There are four types of triangulation, namely data triangulation, theory triangulation, investigator triangulation and methodological triangulation. In this thesis, both data triangulation and methodological triangulation have been used. Data triangulation is using different sources of data in one study, (i.e. primary data and secondary data) (Denzin, 1970), while methodological triangulation is using multiple methods (qualitative research and quantitative research) in one study. Jick (1979) identified several benefits brought by triangulation namely: 1) it can provide richer and thicker data; and 2) it can yield more comprehensive results, which allow researchers to be more confident of the results.

Two types of triangulation have been outlined by Morse (1991), which are simultaneous and sequential triangulation. The former is that the qualitative and quantitative methods are simultaneously used in one study. In this case, the interaction between qualitative and quantitative data is limited, but the findings can complement each other in the interpretation stage. Creswell (2003) also called it concurrent procedures. The latter is when one method's result is necessary to plan another method (Morse, 1991). It may start from qualitative

methods for exploratory intents and follow with quantitative methods to generalise the results to a population. As an alternative, it may involve beginning with quantitative methods to test theories or concepts and sequentially using qualitative methods to have detailed exploration (Creswell, 2003). Creswell (2013) highlighted several mixed methods strategies (see Table 4-2). Another strategy called transformative procedures has been mentioned by Creswell (2003), in which a theoretical lens is referred to as a principal perspective when design research methods contain both qualitative and quantitative data. As can be seen from all mixed methods strategies, the two databases are separated, but also connected (Creswell, 2013).

Table 4-2: Mixed Methods Strategies

Implementation	Integration
Simultaneous (Concurrent Procedures)	At data collection
Sequential Procedures – QUAL first	At data analysis
Sequential Procedures – QUAN first	At data interpretation/ with some combination
Transformative Procedures	At data collection and data analysis

Source: Adapted from Creswell (2003), Creswell (2013)

The sequential exploratory design will be adopted, whereby the sequential procedures involve beginning with qualitative research and following with quantitative research (Creswell, 2013), and the process is shown in Figure 4-2.

The purpose of the strategy is to use the data and results of quantitative research to support the interpretation of qualitative findings (Creswell, 2013). The advantages of the sequential exploratory strategy are:

- 1) It can be implemented more intuitively and straightforwardly to describe and report;
- 2) It is beneficial for researchers who want to build a new instrument;
- 3) It makes qualitative study more straightforward for advisers and a research community who may not be familiar with qualitative approaches.

Figure 4-2: Sequential Exploratory Design



Source: Creswell, Plano Clark, Gutmann, and Hanson (2003)

Specifically, this research adopts sequential triangulation with sequential exploratory design. The main methods are document analysis, semi-structured interviews and a small-scale quantitative survey. The qualitative research that includes document analysis and semi-structured interview is conducted to identify a general idea on public policies and the attitudes, and quantitative research with survey is a follow-up phase to generalise the results of the first phase (see Table 4-3).

Table 4-3: Three Stages of Research and Methods Adopted

	Stage 1	Stage 2	Stage 3
Data Collection	Document analysis		
		Semi-structured Interviews	
			Questionnaires
Data analysis		Analysis	

Source: Author

4.2.3 Documents Analysis

Document analysis has been recognised as part of qualitative methods for many years (Bowen, 2009). Data from document analysis should be examined and interpreted to educe meaning, acquire understanding and explore empirical knowledge (Corbin and Strauss, 2008). Denzin (1970) mentioned that document analysis is normally used with other qualitative research methods as a means of triangulation. As previously mentioned, the information collected and analysed in several methods can reduce possibilities of potential bias and uncertainty. Mostly, the document analysis is adopted as a complement to other research methods.

The document analysis is specifically used (Bowen, 2009) when:

- 1) Data providing contexts are needed in research;

- 2) Information of questions and situations that need to be studied in research is contained in documents;
- 3) Document data can provide data as a complement to others;
- 4) Document data can provide data for researchers to identify changes and development;
- 5) Findings and evidence from other sources need to be verified or corroborated.

Document analysis gains popularity because of several advantages, for example, cost-effectiveness and efficient method. However, it also exhibits some drawbacks, such as low retrievability and biased selectivity. Bowen (2009) provides more detailed advantages and disadvantages about document analysis (see Table 4-4).

Table 4-4: Advantages and Disadvantages of Document Analysis

Advantages	Disadvantages
Efficient method	Insufficient detail
Availability	Low retrievability
Cost-effectiveness	Biased selectivity
Lack of obtrusiveness and reactivity	
Stability	
Exactness	
Coverage	

Source: (Bowen, 2009)

The first reason of using document analysis as the first phase of this research is that it can provide information to design research questions. The information includes the policy contexts, industry development track and relevant policies. Secondly, document analysis can verify or complement the results from other sources. Thirdly, it is a cost-effective and efficient way to collect data. Last, but not least, document data are available in the public domain, and, also, it is stable as it is not altered by researchers.

The document analysis will mainly focus on the government documents that were released within the last five years. Most documents are either accessible mainly from government websites, or provided by public officials interviewed. The documents used in the document analysis are reliable because they are all available from the government website and are issued by the central government

or local government. There should not be any bias because all the documents are policy documents; information from other sources, such as media or reports, will be not considered as valid materials in document analysis.

4.2.4 Semi-structured Interviews

One of the most important sources of case study is interview (Yin, 2014). There are three types of interview, namely unstructured or in-depth interviews, semi-structured interviews and structured interviews.

Structured interviews are also called standardised interviews, which allow interviewers to ask the same questions to each respondent in the same way. Unstructured interviews involve limited number of topics and frame successive questions in accordance with the interviewee's previous response. Semi-structured interviews apply planned questions or topics in the same way as structured interviews, but use open-ended questions (Fox, 2006).

This research adopts semi-structured interviews. Semi-structured interviews are normally adopted when there is limited information about the subject area, or a need to collect attitudinal information on a large scale (Fox, 2006). In addition, semi-structured interview is more flexible than structured interviews, and it also shows more comparability and makes it easier to analyse data than unstructured interview (Noaks and Wincup, 2004).

There are four categories of interviewees, as shown in Table 4-5; a face-to-face interview method is adopted in this research. Seventeen interviewees from four different organisations participated in the research. As the research aim is to understand the effectiveness of policies to technology-based SMEs, public officials and entrepreneurs in technology-based SMEs were selected as the target groups. Additionally, from the document analysis, the intermediaries also play a significant role for implementation of government policies in China. Thus, the managers in facilitating agencies took a big part in the interviews.

The author applied different methods to reach the targeted groups. Table 4-5 shows the selected number of interviewees and actual number of participants. More specifically, for the public officials, the author emailed and called the government offices directly and requested to have an interview with them. Four out of 11 targeted government departments were successfully accessed, including the Ministry of Science and Technology, Ministry of Industry and

Information Technology, Ministry of Commerce and the National Development and Reform Commission. For the managers in facilitating agencies, the author made use of her personal networks and asked her friends and relatives who work in this area to introduce the relevant people. Eventually, three participants from a science park and two participants from service centres participated in this study. For the entrepreneurs' group, the author targeted at three industries, which are the service industry, IT, and manufacturing. The author called and emailed the relevant companies and, at the same time, the author asked the previous participants to introduce entrepreneurs who suited this subject. The author contacted 12 companies and four of them got in touch and joined the interviews; they are Cai from service industry, He from service industry, Xu from IT, and Jin from service industry. Another three entrepreneurs were introduced by other participants; they are Rui from IT, Tie from manufacturing, and Jun from manufacturing. Finally, in order to understand more about the characteristics of entrepreneurship in China and the effectiveness of public policies, the author decided to interview scholars in this field. To do so, the author searched the websites of top two universities and tried to find people who suited this subject. The author emailed eight professors who work in the similar field and finally successfully reached one scholar from the University of Tsinghua.

Table 4-5: Sources of Interviewees

Sources of Interviewees				
Categories	Public officials	Entrepreneurs	Managers of facilitating agencies	Scholars
Attempted	11 from each related departments (11)	12 random Selection + 3 introduced by other participants (15)	5 introduced from personal networks (5)	8 scholars from top two universities in China (8)
Attempted total				39
Methods	Call and Email	Call and Email/ Introduced by other participants	Introduced from personal networks	Email
Actual participants	(4)	4 random selection + 3 introduced by other participants (7)	(5)	(1)
Participants Total				17

Source: Author's Fieldwork

It can be seen that fewer than half of the selected interviewees participated in the interviews. Actually, the author got 100% responses only when introduced by

other people. It was difficult for the individual researcher to gain access to the targeted interviewees, unless the researcher has connections with the relevant people. The success rate was less than 30% when the author tried to get access to target groups without any connections.

Table 4-6 shows the profile of respondents. Entrepreneurs, as the most important part in this research, took the biggest part – seven out of 17 interviewees were entrepreneurs. Two interviewees were from the IT industry, two participants from manufacturing, and three participants from the service industry. The first group represents the industries that require high innovation and relatively less capital; the second group represents the industries that require middle innovation and relatively higher capital; and the third group represents new pattern industries.

The second biggest group is managers in facilitating agencies – five out of 17 interviewees. The coverage of facilitating agencies is wide in China. Law firms, accounting firms, science parks, local banks and public institutions under local government all belong to facilitating agencies. They act as a bridge between the government and firms.

Four public officials were from the Ministry of Industry and Information Technology (2), the National Development and Reform Commission and the Ministry of Commerce, respectively. They introduced the policies released in different departments and the relationship, the development track among these departments and the policy implementation.

Finally, one scholar was a professor in entrepreneurship from the top university in China, who participates in policy designing and specialises in studies on technology-based SMEs. It is disappointing that only one scholar finally joined this research. In order to avoid bias, only when the statements of the scholar were also supported by other interviewees were taken as valid information.

Table 4-6: Profile of Respondents

Name: 17	Identity: 4 categories E: Entrepreneurs G: Government Officials S: Scholars A: Intermediaries	Recorded/Unrecorded
Cai	E: Service	Recorded
He	E: Service	Recorded
Rui	E: IT	Recorded

Tie	E: Manufacture	Recorded
Xu	E: IT	Recorded
Jin	E: Service	Unrecorded
Jun	E: Manufacture	Unrecorded
Wen	G	Recorded
Yan	G	Recorded
Meng	G	Unrecorded
Lai	G	Unrecorded
Li	A: Science Park	Recorded
Ying	A: Service Sector	Recorded
York	A: Service Sector	Recorded
Zh	A: Science Park	Recorded
Lou	A: Science Park	Recorded
Lei	S	Recorded

Source: Author's Fieldwork

For each group, discussion guide emphasis was slightly distinctive. The interview discussion guides can be found in Appendix 3 and 4. There are three parts of questions in the research discussion guide. The topic of the first part is about general economic conditions in China. Specifically, all participants were asked their general feelings on the economic conditions, for example, market competition level and state of the SME sector in China. The second part is to ask questions about technology-based SMEs, such as the unique policies about technology-based SMEs, the effects of policies and the internationalisation conditions of technology-based SMEs. In the third part, each group was asked in-depth questions relative to their respective fields. More specifically, public officials were asked questions about the advantages and disadvantages of current policies for technology-based SMEs, the barriers they met when operating these policies, or the general feedback of the effects of these policies. For entrepreneurs, the questions were more about the barriers they met in their industry, their personal feelings about the effects of these policies, or some needs they hope to be satisfied from policies. Managers in facilitating agencies as the middle layer group, were asked questions about how to manage the balance between government policies and technology-based firms' demands. Finally, the scholars was asked about their research results in this field, such as the weakness and strength of current policies and the entrepreneurship environment of China.

4.2.5 Questionnaires

Quantitative methods examine the relationships and variables to test the objective theories which can be statistically measured and analysed (Creswell et al., 2003). Compared with qualitative research, it is generally objective and typically requires the application of scientific procedures to satisfy the research objectives when discovering answers to questions (Denzin and Lincoln, 2008). Questionnaire surveys are the most common type of quantitative method for generating primary data (Coles, Duval & Shaw, 2012). The most significant advantage of questionnaire surveys is the potentially efficient information or data collection from a small group of people over a short period (Creswell et al., 2003).

The survey questions were extensively reworked twice, as shown in Figure 4-3. The original survey was designed based on the literature review chapter but was largely amended according to the results of the semi-structured interviews. Furthermore, the author had pilot surveys with ten participants. The questions that had less than one-quarter of responses were deleted. The changes did not significantly affect the aim of this research. The original questionnaire, the pre-test questionnaire and final questionnaires are given in the Appendix 6, 7 and 8.

Figure 4-3: Questionnaire Design



Source: Author's Fieldwork

Based on the interview results, the first significant amendments were the focus changes. The pre-test questionnaire put more emphasis on the effectiveness of science parks on the development of technology-based SMEs, and lessened the questions about patents and intellectual rights. The reason for this amendment was that entrepreneur participants indicated that they have less knowledge on this question and they believed that intellectual rights were not well protected.

Furthermore, the science park was a major part of the questionnaire because all interview participants mentioned that a science park was a very successful government instrument for the development of technology-based SMEs. Both reasons were behind the first change of questionnaire.

The second amendments deleted some questions that were rarely answered. Those questions were more likely in the company profile sections, such as Question 6, "*please indicate the TOTAL turnover of your company*", and Question 7, "*how many employees were/are in your company*". Fewer than three out of ten participants responded on these questions and the answers were not very reliable. As such, the entrepreneurs in China were very cautious to reveal their company profile even when the questionnaires were anonymous. The final questionnaire contained 29 questions from what previously had been 36 questions.

The purpose of this survey was to acquire generally objective results and also, to some extent, to test results from interviews in population. A postal-based questionnaire was applied in this study, rather than face-to-face questionnaires, because the targeted companies located geographically separated. The questionnaire included six parts, namely, company profile, economic profile, business start-up conditions, firms in and outside a science park, government support and internationalisation.

Company profile was to learn the general company status. For example, the year of foundation, their main competitors and industry the company belongs. Economic profile was to understand the entrepreneurs' general perspectives on current Chinese economic conditions. Specifically, they were asked about the general state of the SME sector, and the limitations of SMEs. Part three was about the entrepreneurial environment specifically for starting a business. The participants were asked about the main barriers they met when starting a business, as well as the start-up financing situation.

From the fourth part, the participants were separated into two groups, one was firms geographically in a science park, and the other was firms outside of a science park. They were asked their views about science parks. For example, "*do you think preferential policies give priorities to enterprises in the science parks*", and "*do you think firms in a science park perform better than firms outside a science park?*" The fifth part was asking them what government support they

perceived as useful policies for their development. And, finally, the internationalisation part was to study the barriers of expanding international markets, and whether there was any support that was useful for SMEs to start considering international markets.

Convenience sampling techniques were used in selecting respondents for the survey. It has been acknowledged that convenience or availability sampling is one of the most commonly used techniques within the field (Rubin and Babbie, 2015). 150 questionnaires were sent out through the Internet and 96 completed and valid questionnaires were obtained. As those technology-based SMEs located geographically separated, it was time consuming to have face-to-face questionnaire survey. For improving the collecting rate, the author had called each company to remind them sending back the questionnaires. The first ten participants formed part of the pilot.

4.3 Data Analysis

For the purpose of producing a robust and information-rich case study, data obtained from documents, semi-structured interview and questionnaire were combined and analysed as a whole. Analytical software, such as Nvivo and SPSS, were used to help analyse qualitative and quantitative data, respectively. The results of analysis were used to answer the research questions and, thus, research the four objectives introduced in Table 4-1.

4.3.1 Thematic Analysis

Thematic analysis approach has been taken as the method to analyse qualitative data, which is a common approach to analyse qualitative data. This method is to develop themes or patterns with the data set (Braun and Clarke, 2006). To search for themes and patterns in the interview transcripts, Ryan and Bernard (2000) suggested to consider the following:

- 1) Repetitions: Repeatedly mentioned topics
- 2) Indigenous topologies or categories: local expressions that are either unfamiliar or are used in an unfamiliar way
- 3) Metaphors and Analogies: the ways in which participants present their thoughts in terms of metaphors or analogies
- 4) Transitions: the ways in which topics shift in transcripts

- 5) Similarities and Differences: exploring how respondents might discuss a topic in different ways
- 6) Linguistic connectors: consider the usage of words like “because” or “since”, because such words point toward causal connections in the mind of the interviewees
- 7) Missing Data: reflecting on information which was not mentioned
- 8) Theory-related material: using social scientific concepts as starting points for patterns or themes

In addition, Braun and Clarke (2006) argued that some topics which are repeated several times are not necessarily considered as a theme. The thematic analysis is seen as a recursive process, which is reflected upon throughout the process of analysing the data.

The themes are selected based on the literature reviews and interviews; they are entrepreneurship, general entrepreneurship environment, policy, SMEs and Science Park. Figure 4-4 shows the nodes used to analyse the interview data. The contents within each key node might be different from the final version of interview analysis. For example, the general economic environment and entrepreneurial culture were finally put together in the qualitative analysis chapter to understand entrepreneurship environment.

Figure 4-4: Nodes

Nodes		Look for:	Search In	Nodes	Find Now	Clear
<ul style="list-style-type: none"> Nodes Relationships Node Matrices 						
Nodes						
Name	Sources	Referenc	Created O	Created	Modified On	Modified
Comparison Between Firms Inside and Entrepreneurship	10	34	17/03/20	MC	04/04/2015	MC
Entrepreneurial Culture	6	7	16/03/20	MC	04/04/2015	MC
Entrepreneurs	4	5	15/03/20	MC	03/04/2015	MC
Entrepreneurs' Identity in One Instit	2	4	15/03/20	MC	03/04/2015	MC
Motivation	4	7	15/03/20	MC	04/04/2015	MC
Previous Experience	7	11	15/03/20	MC	04/04/2015	MC
Start-up Financial Capital	4	4	15/03/20	MC	03/04/2015	MC
Bank Loan	4	5	16/03/20	MC	04/04/2015	MC
Equity Financing	1	1	16/03/20	MC	31/03/2015	MC
Government Investment	3	5	16/03/20	MC	04/04/2015	MC
Individual Investment	3	5	15/03/20	MC	04/04/2015	MC
M&A	1	1	16/03/20	MC	31/03/2015	MC
Self-raised Funding	8	9	15/03/20	MC	04/04/2015	MC
Venture Capital	6	12	15/03/20	MC	04/04/2015	MC
General Economic Environment	2	2	15/03/20	MC	03/04/2015	MC
Attitude For Starting Business	0	0	15/03/20	MC	31/03/2015	MC
Effects	8	16	15/03/20	MC	04/04/2015	MC
Negative	0	0	15/03/20	MC	31/03/2015	MC
Positive	7	10	15/03/20	MC	04/04/2015	MC
Attitude For State-owned Firms	2	2	15/03/20	MC	03/04/2015	MC
Internationalisation	7	14	15/03/20	MC	04/04/2015	MC
Barriers to Go International	7	10	16/03/20	MC	04/04/2015	MC
Connections with Foreign Coun	7	9	15/03/20	MC	04/04/2015	MC
Reasons to Go International	5	7	16/03/20	MC	04/04/2015	MC
To What Extent Internationalisa	9	12	16/03/20	MC	04/04/2015	MC
Policy	11	48	16/03/20	MC	04/04/2015	MC
Finance	10	30	16/03/20	MC	04/04/2015	MC
Human Capital	6	14	16/03/20	MC	04/04/2015	MC

Information	3	4	16/03/20	MC	04/04/2015	MC
Market	6	11	16/03/20	MC	04/04/2015	MC
Science Park	6	25	17/03/20	MC	04/04/2015	MC
Industry	0	0	15/03/20	MC	31/03/2015	MC
Cultural and Creative	2	6	15/03/20	MC	31/03/2015	MC
IT	0	0	16/03/20	MC	31/03/2015	MC
Medical	0	0	16/03/20	MC	31/03/2015	MC
Interviewees	3	3	17/03/20	MC	31/03/2015	MC
SME	2	4	15/03/20	MC	04/04/2015	MC
Barriers	3	4	15/03/20	MC	04/04/2015	MC
Affect by Government Policy	6	11	15/03/20	MC	04/04/2015	MC
Affect by Intermediaries	3	4	17/03/20	MC	03/04/2015	MC
Affect by Large Firms	7	9	15/03/20	MC	04/04/2015	MC
Finance	8	19	15/03/20	MC	04/04/2015	MC
Human Capital	3	4	15/03/20	MC	03/04/2015	MC
Information	2	3	17/03/20	MC	31/03/2015	MC
Market	6	14	15/03/20	MC	04/04/2015	MC
Networking	2	2	15/03/20	MC	03/04/2015	MC
Comparison Between LC and SME	5	10	15/03/20	MC	04/04/2015	MC
Advantages	2	8	15/03/20	MC	03/04/2015	MC
Disadvantages	8	15	15/03/20	MC	04/04/2015	MC
Needs to Grow Large	1	1	15/03/20	MC	03/04/2015	MC
R&D	11	25	17/03/20	MC	04/04/2015	MC
To be listed	3	6	16/03/20	MC	04/04/2015	MC

Source: Author's Fieldwork

The interviews proceeded in Chinese mandarin. It raised a problem in that, at whatever stage, it involved acts of translation between Chinese mandarin and English. It is acknowledged that people using different languages may construct different ways of seeing social life (Temple and Young, 2004). When researchers carry out qualitative analysis, they need to consider the cultural background (Temple and Young, 2004). The author herself is a Chinese native mandarin speaker. Thus, carrying out the qualitative analysis with Chinese and proceeding translation after having the results was adopted as the best option. It is argued that, if the researchers consider themselves as objective and neutral, then it does not matter who does the translation and at whatever stages the translation is carried out. The result should be the same (Temple and Young, 2004). However, as presented in the philosophical assumption in Section 4.1, the author believed that reality is socially constructed and often has a subjective epistemological standing (Saunders et al., 2011). Every person understands the world differently due to their personal experiences. Thus, researchers who can translate themselves are automatically considered as the best cases to do cross-language data analysis (Temple and Young, 2004). The author carried on the interviews, transcriptions and translations by herself, to minimise the potential biases.

4.3.2 Statistical Analysis

The statistical analysis was applied to process the questionnaires. Statistical tests determine if the probability of the results is due to chance and concludes whether the data set is statistically significant or insignificant (Finn, Walton & Elliott-White, 2000). When the sample correlation is examined to be significant, the result can be further used a generalisable variable of the whole population. Parametric and non-parametric statistical techniques are the main types of statistical analysis (Roehrig, 1988). In social science research, as well as the current limited available entrepreneurship study, the measurable variables are not normally distributed (Pallant and Manual, 2007). Thus, non-parametric tests would be the main analysis types in this thesis, including Spearman's rank correlation coefficient and Mann-Whitney U test. Meanwhile, there are a few scale variables, such as "year established" and "barrier scores". Thus for testing the differences between two independent groups on ratio or interval level, the parametric analysis namely independent samples t-test is applied. The independent samples t-test also called student's t-test, which determines whether

two populations express a significant or nonsignificant difference between population means (Haynes, 2013).

The author used the Statistical Package for the Social Science (SPSS) software programme to conduct the statistical analysis. The probability value in the tests is that 0.05 was adopted for the research. As Finn et al. (2000) explained, with small probability value [P] the results are unlikely to happen by chance, which can be generalised to population and, with $P=0.05$ is the widely acceptable level for the researcher in social science. $P=0.05$ means that an estimate of 5% will be incorrect. Thus, the author rejected any other results having P value higher than 0.05.

Table 4-7 shows the tests the author used to analyse the data. Univariate and bivariate tests were carried out in the quantitative analysis. Descriptive statistics was the first stage that was carried out to examine how data or individuals were distributed in relation to a single variable (Bryman and Cramer, 2005), for example, the industries to which the firms belong. However, it is argued that univariate analysis cannot test the relationship between variables. Thus, bivariate analysis, including Mann-Whitney U test, Spearman's rank correlation coefficient and independent t-test, was applied to allow the researcher to examine the relationship between variables.

Table 4-7: Statistical Tests

Type of Analysis	Test Name
Univariate	<ul style="list-style-type: none">• Descriptive statistics (Mode, Mean, Standard Deviation)
Bivariate	<ul style="list-style-type: none">• Spearman's rank correlation coefficient• Mann-Whitney U test• Independent Samples t-test

Source: Author

4.4 Ethical Concerns

Every research should involve some ethical considerations. The University of Exeter has set out the ethical guidelines and an ethical report was submitted and approved by the Business School Ethics Representative.

Ethical considerations need to be concerned before the process of data collection, and these may reflect on issues of confidentiality, security and storage, data

protection, voluntary participation and awareness of the study's purposes and reporting. This project involves obtaining and processing personal data relating to the participants; the personal data will be properly stored for an appropriate period of time. I will keep clear and accurate records of the procedures followed and the approvals granted during the research process. Research data is confidential and safely documented.

All the participants provide information voluntarily and need to sign consent forms, which provide the right to withdraw from the research at any time. Firstly, the consent form provides the information of the main purpose of this research. This informs the participants that the purpose of this study is to learn how government interventions influence technology-based SMEs in China. The consent form also introduced the interview design to participants. *"I will ask you questions about what you think of the macroeconomic environment of China, the status of technology-based SMEs in China, and how you feel with the government interventions in this industry"*.

More specifically, the consent form provides six options for participants who will be asked if they agree with these requirements. *"I agree to take part in the above study"*, *"I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason"*, *"I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions"*, *"I agree with using my name in the report"*, *"I agree to the interview consultation being audio recorded"*, and *"I would like to receive a copy of the summary report on the findings of research"*. Only the actions that are agreed by participants will be implemented.

For further information see Appendix 1.

5. Qualitative Analysis: Document Analysis

5.1 Introduction

In Chapter Three, the author introduced the overall economic situation and entrepreneurship environment of China. Bypassing the dramatic economic development, China also enjoyed increasing significance in political power in the world. It is one of five permanent members of the United Nations Security Council, and the only Communist Party-led state in the G-20 grouping of major economies (Lawrence and Martin, 2012). Through the increasingly important role that China plays in the world arena, both the economic and political power that it exhibits, have gained growing attention from scholars and policy makers. Some empirical literature has also suggested that, in contrast to the spectacular economic performance, the Chinese institutions in government, corporate governance, law and finance seem notoriously weak (Xu, 2011). Although the conventional wisdom suggests that government should separate itself from business and protect private property rights (North, 1981), China's reform and development is definitely an unconventional mode; the government in China is deeply involved in business (Xu, 2011). As briefly mentioned in Section 3.6, China's SMEs have experienced three development phases since the launch of the reform and opening policies in 1978. It has gradually shifted China's economic system from planned economy to a socialist market economy with Chinese features (Aversa, 2013). It should be highlighted that the result of the reform and opening policies affected a shift of not only the economic, but also the judicial and political system. It should be noticed that a study of China's economy, or business activities, can never be accomplished without an understanding of China's political system. Thus, a study of the political background associated with business is necessary to understand the economy of China.

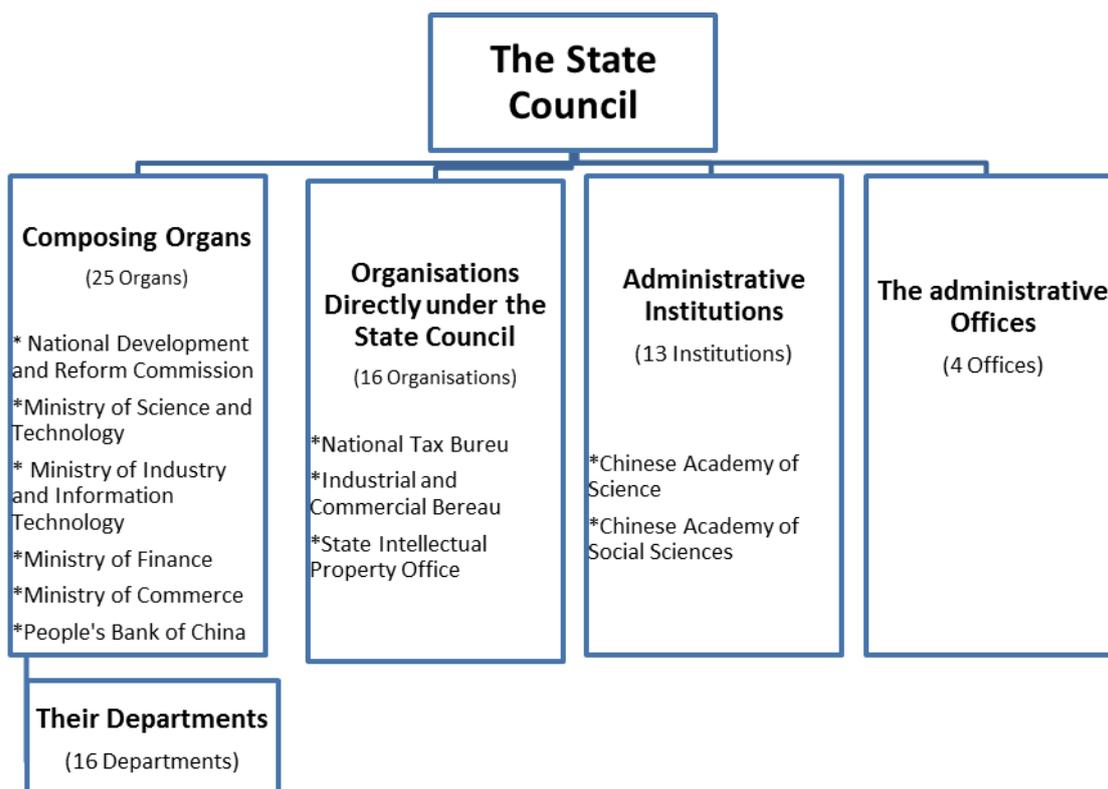
This chapter aims to display the entrepreneurship-related information from a political perspective. This chapter was to answer how policies are implemented from policy documents in China. Three key sections constitute this chapter. The first key section will examine how policies are being implemented from policy documents. Furthermore, the second and third sections will explore the latest entrepreneurship and SME policies at a national, local and regional level, in order to providing background information for the examination of policies.

5.2 From Policy Post to Policy Implementation

The literature review chapter illustrated the relationship between Party, national government and local government. The Politburo Standing Committee stands for the Party. Lawrence and Martin (2012) questioned the political system in China in that a Party above the law may have problems in the long-term viability. However, this political system is the current system in which this research took place, and it may only be studied for the purpose to provide a background; thus, the long-term problems will not be studied in detail.

State Council is the locus of power in the State System, there are 25 organs composing the State Council, and 16 organisations directly under control of the State Council. Under the State Council, there are 13 administrative institutions and four administrative offices. In these departments, the author listed 11 departments that have the most direct association with the development of technology-based SMEs, as shown in Figure 5-1. They are the National Development and Reform Commission, Ministry of Science and Technology, Ministry of Industry and information Technology, Ministry of Finance, Ministry of Commerce and People's Bank of China from the organs composing the State Council, and the National Tax Bureau, Industrial and Commercial Bureau and State Intellectual Property Office from the organisations directly under the State Council, and the Chinese Academy of Science and Chinese Academy of Social Science from Administrative Institutions.

Figure 5-1: The Framework of the State Council



Source: Adapted from the State Council website (State Council, 2014)

Actually, other departments that are not listed in Figure 5-1 may, to some extent, affect the development of technology-based SMEs, but whether they may indirectly affect or may not affect their daily business will not be studied in the thesis. Table 5-1 presents the organisations mentioned in the previous figure and the matched policies.

Table 5-1: Organisations and Policies

Organisations	Policies
the National Development and Reform Commission	General policies related to the development of SMEs
Ministry of Science and Technology	Technology related policies
Ministry of Industry and information Technology	General policies for the development of each industry
Ministry of Finance	Financial policies
Ministry of Commerce	Internationalisation policies and to create fair trade environment
People's Bank of China	Financial policies/Adjustment of interest rates

National Tax Bureau	Taxation
Industrial and Commercial Bureau	General policies to monitor and supervise the development of SMEs
State Intellectual Property Office	Innovation policies (Intellectual property rights)
Chinese Academy of Science	Providing advisory and appraisal services on issues stemming from the national economy, social development and science and technology progress
Chinese Academy of Social Science	Has the obligation of advancing and innovating in the scientific researches of philosophy, social sciences and policies

Source: Author

As mentioned previously, the Chinese political system is centrally-controlled regional decentralisation. The state-level organisations mostly set the policy tone and formulate policy frameworks. However, local governments have direct control rights over a substantial number of resources. Moreover, they can initiate their own policies and laws, as long as those policies and laws do not go against the national policy tone and framework.

Take human capital policies as an example. Table 5-2 displays human capital related policies at different policy level, including national policies, local policies, science park regional policies and individual science park policies. *A Long-term Plan for the Development of Scientific and Technology Talents* (MOST, 2011a) is a national level policy released by the Ministry of Science and Technology in 2011, which set a long-term plan for the coming decade from 2010-2020. It can be found that it was closer to a guidance of a future plan or a development direction, because it did not set detailed implementation ways. The main objective of this document was to cultivate more scientific and technology talents to meet the increasing fierce international competition in knowledge and talent. The main principles were: a) to cultivate more innovative talents; b) to promote the flow of talent that benefits the purpose of optimising the industry structure; and c) to strengthen the cultivation of talent by the native education system and attract more overseas talent to return to their home country.

The document reflected a means of top-level design, which did not decide the implementation way, but it set the goals, principles and tasks. It set the long-

range objectives, such as R&D personnel should reach 3.8 million in 2020, or the R&D expenses will increase to the standard of moderately developed countries by 2020. After documents from those nation-level organisations were released, each sub-national government started to design their own regulations and policies. For example, Beijing Municipal Government formulates its own matching policies, such as “*Interim regulations to attract overseas talents to work or start businesses in Beijing*” (Government, 2009) and “*Interim regulations to cultivate talents*” (Government, 2011). From the perspectives of local government, they will generally provide matching funds to support the national policies, and also make a detailed implementation plan, as shown in Table 5-2. Finally, Zhongguancun Science Park also has regional policies that benefit on-park firms.

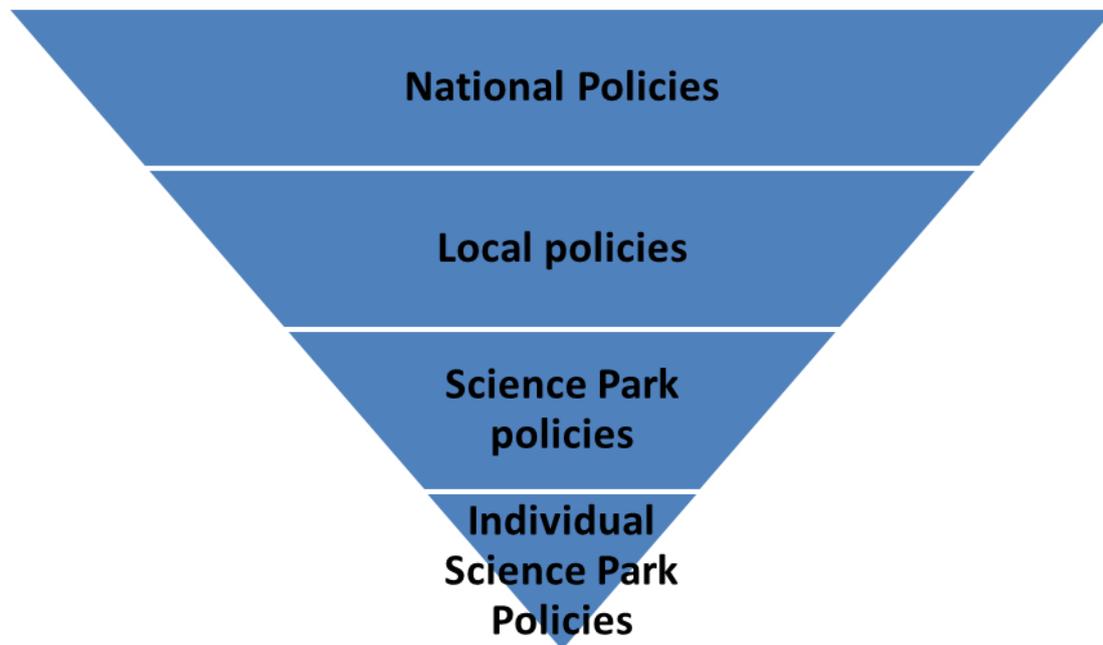
Table 5-2: Examples of Human Capital Policies

Human Capital Policies				
Policy Document	Tool	Department	Policy Level	Reference
A Long-term Plan for the Development of Scientific and Technology Talents	Guidance	Ministry of Science and Technology	National	(MOST, 2011a)
Interim regulations to attract overseas talents work or start businesses in Beijing	Offering good living conditions, financial incentives, etc.	Beijing Municipal Government	Beijing	(Government, 2009)
Interim regulations to cultivate talents	Financial supports, education opportunities, training opportunities, etc.			(Government, 2011)
Supportive fund management regulations for talents cultivation	Financial supports (overseas returnees, young entrepreneurs, and prize-winners from entrepreneurial contests)	Zhongguancun regional policies	Science Park policy	(Zhongguancun, 2013)
XX Science Park policy	Hukou Quota	XX Science Park	Individual Science Park policy	
	Employees' offspring enrol in school near workplace			
	Innovation forum			
	Funds			

Source: Author's Fieldwork

Figure 5-2 illustrates the policy framework according to the document analysis. Four levels of policies are considered, including national policies, local policies, science park policies and individual science park policies. Policies from each level can directly target at firm level. However, the top level policies, national and local policies, are more likely to decide the policy directions and provide guidance of supportive methods. The bottom level policies, science park policies and individual science park policies, normally have more direct relationship with firms. It should be noted that local policies target at all technology-based SMEs, no matter where they locate. But, since science parks act as the main implementers, it might cause policy bias in that on-park firms are more likely to enjoy supportive policies, which will be further studied in the following two analysis chapters.

Figure 5-2: Policy Framework



Source: Author's Summary

5.3 The Latest Policy Priorities Relative to Technology-based SMEs

The new policies released since 2010 have exhibited a clearer policy focus, which vigorously supports small to micro-sized enterprises and innovative activities. One document released by the Ministry of Science and Technology in 2011, translated as "*Some Suggestions to promote the development of innovation in technology-based SMEs*", provided the overall direction of government support on technology-based SMEs (MOST, 2011b). In this document, the technology-

based SMEs were highly praised for their important role in economic growth, industrialisation of achievements of science and technology, and employment creation. It highlighted the drawbacks of the technology-based SMEs in China, including difficulty in financing, lack of innovative talent, lack of public service to support innovation, imperfect policy environment and relatively low level of management of technology-based SMEs. This document presented several suggestions to alleviate these drawbacks. Six suggestions with 21 implementation methods were proposed (see Table 5-3).

Table 5-3: Some Suggestions to Promote the Development of Innovation in Technology-based SMEs

Advices	Implementation Methods
Industry- Research Institute Collaboration	1. Promote the collaboration between universities/research institutions and technology-based SMEs to have joint development programmes and cultivate innovative talents together
	2. Promote the development of scientific intermediary organisations
	3. Promote the transfer of technology achievements from universities/research institutions to technology-based SMEs
Clustering	4. Increase the construction of science parks and reinforce the clustering
	5. Guide the government funding of the promotion of cluster development of technology-based SMEs
Public Service	6. Promote the public service institutions to provide supports to technology-based SMEs
	7. Promote the sharing of technological resources from universities/research institutions and large firms with technology-based SMEs
	8. Strengthen intellectual property rights consciousness and standardise relative services
	9. Promote the other professional institutes to provide support to technology-based SMEs, such as law firms and accounting firms
Finance	10. Promote internationalisation by supporting international communication and interaction
	11. Promote the integration of financial products with technology
	12. Promote banks to provide credit to technology-based SMEs
	13. Construct and perfect financing guarantee system for technology-based SMEs
	14. Speeding up the construction of equity financing system for technology-based SMEs

	15.Promote the development of stock market for technology-based SMEs
Innovation	16.Encourage the R&D investment of technology-based SMEs
Investment	17.Further the guiding function of innovation funds
	18.Support innovation of technology-based SMEs with innovation funds
Policy	19.Perfect the regulations and policies for technology-based SMEs
Environment	20.Establish policies to attract more talent from local and abroad
	21.Strengthen implementation of policies

Source: Government document (MOST, 2011b)

This document exhibited the new trend of government policy that shifted from only focusing on financial support to an integrated support method. Since then, based on this document, other organs and government institutions have released implementation methods to promote the development and innovation of SMEs. Thus, the overall policy environment since 2011 can be seen as a turning point for the development of technology-based SMEs, and this document will be applied as the main government document in this thesis.

China's twelfth five year plan also started from 2011, which emphasised a higher quality growth. The goals in the plan highlighted the importance of protecting environment and improvement of energy efficiency. Moreover, for the purposes of sustainable growth and moving up China's value chain, seven priority industries were highly emphasised (see Table 5-4), all of which are included in the new and high-tech industry field.

Table 5-4: Priority Industries

Priority Industries	
New Energy	Nuclear, wind and solar power
Energy conservation and environmental protection	Energy reduction target
Biotechnology	Drugs and medical devices
New materials	Rare earths and high-end semiconductors
New IT	Broadband networks, internet security infrastructure, network convergence
High-end equipment manufacturing	Aerospace and telecom equipment
Clean energy vehicles	

Source: China's Twelfth Five Year Plan (NDRC, 2010)

5.4 Beijing Government Policy

As discussed in Section 5.2 , the national government decides the overall policy tone and formulates policy frameworks, but it is the local government which directly practises the policies; they have the right to initiate their own policies and laws based on the national policy. The Beijing government also is a local government, it enjoys its own local policies, which might be similar to or differ from other areas. In addition, as Beijing policies are based on the national policy, the emphasis points are the same as the policies mentioned above. But, when going through the policy documents, it can be found that they mostly gave priority to firms inside a science park, inside an incubator, or receiving angel capital. Thus, in the section, rather than repeat the policies in Beijing, the author will present the unique policies of science parks, which are included in local policies. Firstly, I will introduce the Zhongguancun Science Park and the policies in science parks in general will be presented later.

5.4.1 Zhongguancun Science Park in Beijing

Government analysis documents called “*Zhongguancun Science Park: 20th Anniversary Development Retrospect*” (Zhongguancun, 2007) exhibit the overall development history of Zhongguancun Science Park from 1988 to 2007.

1988: Beijing New Technology Industry Development Experimental Zone, as China’s first state-level high-tech Industrial Development Zone, was approved by the State Council and established in Beijing.

1998: Zhongguancun Science Park was developed from one park only, Haidian Park, to three parks, Haidian Park, Fengtai Park and Changping Park.

1999: The State Council released a document about accelerating the construction of the Zhongguancun Science Park. Zhongguancun Science Park developed from three parks to five parks, including Haidian Park, Fengtai Park, Changping Park, Electronics City Science Park and E-Town Development Park.

2003: Desheng Creative Park became the sixth park of Zhongguancun Science Park.

2004: Jianxiang Park became the seventh park of Zhongguancun Science Park.

2005: The State Council introduced a policy about “eight policies and measures for supporting and developing the Zhongguancun Science Park”.

2006: The Zhongguancun Science Park consists of ten parks. They are Haidian Park, Fengtai Park, Changping Park, Electronics City Science Park, E-Town Development Park, Desheng Creative Park, Shijingshan Science Park, Yonghe Park, Daxing Biology Science Park and Tongzhou Park.

Since 2009, the Zhongguancun Science Park has become a Zhongguancun Zone with 16 Branch Parts around Beijing. Haidian is the main body among these parks.

Figure 5-3 illustrates the sketch map of Zhongguancun Science Park. As can be seen, Zhongguancun Science Park is not a single park, and is composed of 16 science parks around the city. Each park has its own industry priorities. For example, Shijingshan Park mainly focuses on cultural and creative industry, while most firms in Daxing Park are from the biological technology industry. Haidian and Fengtai Park, as they were founded in a quite early period, mostly contain all new and high-tech industries.

Figure 5-3: Sketch Map of Zhongguancun Planning



Source: Zhongguancun Science Park Website

http://www.chinadaily.com.cn/m/beijing/zhongguancun/2011-11/14/content_14089674.htm

In addition, on-park firms enjoyed superior resources to which off-park firms can rarely get access.

1. There are 39 universities in Zhongguancun Science Park, including Beijing University and Tsinghua University, China's top two universities;
2. There are more than 140 scientific research institutions, such as the Chinese Academy of Sciences and the Chinese Academy of Engineering;
3. There are more than 20,000 innovative enterprises, such as Lenovo, Baidu, VI micro, Sinovac and Aigo.
4. There are more than 1,000,000 innovation and entrepreneurship personnel, and more than one-quarter of returnees start businesses in Zhongguancun Science Park;
5. One-third of academicians from the Chinese Academy of Science and the Chinese Academy of Engineering are in Zhongguancun Science Park;
6. One-third of venture investment cases are in Zhongguancun Zone; this investment accounts for one-third of all China. More than 10 enterprises in Zhongguancun Zone have become listed;
7. A hundred and one of the Fortune 500 firms have established more than 70 research centres in Zhongguancun Science Zone;
8. There are one-quarter of state key laboratories, state engineering research centres, the National Research Centre of Engineering Technology and state-level enterprise technology centres;

5.4.2 Special Government Support for Science Parks

Although Zhongguancun Science Park has the right to initiate its own policies and regulations, it is still based on the national policy mentioned in Section 5.2. Since 2010, Zhongguancun Science Park, as a National Independent Innovation Demonstration Zone, has initiated some new policies as a response to national government policies; most of them were experimental projects and are:

1. Stock Ownership Incentive:
2. Technology and Commerce Creating Project
3. Reform the management model for financial input for science and technology rationally

4. Emerging industries participate in national major science and technology projects
5. Government procurement
6. High-calibre personnel
7. Intellectual property
8. Enterprise credit
9. Industry-university-research institution interactive and joint action mechanism
10. Government service
11. Business administration
12. Social organisation management

More specifically, “1+6” policies released by Zhongguancun Management Committee have been applied by Zhongguancun Science Park, some of which have been applied by the science parks of other cities. In “1+6” policies, “1” is to build the innovation platform of Zhongguancun, “6” is six new policies, which include technology achievement disposal and usufruct, tax incentives pilot, stock-based incentive, research funds management, identification of high-tech enterprises and build over-the-counter market under integrated regulation (see Table 5-5).

Table 5-5: “1+6” Policies

	Key points of policy	A major breakthrough	Policy promotion situation
Technology achievement disposal and usufruct	<p>1) Central institutions can dispose technology achievement worth less than 8 million Yuan independently</p> <p>2) Institutions can keep all proceeds if technology achievement is worth less than 8 million Yuan</p> <p>3) For value between 8-50 million Yuan, for the part above 8 million, institutions can keep 90% of the proceeds</p> <p>4) For the value over 50 million Yuan, the part in excess shall be turned over to the State treasury</p>	Made the value segmentation and the proportion clear.	These policies have been expanded to other science parks in Wuhan, Shanghai and Anhui.
Tax incentives pilot	<p>1) Additionally calculate and deduct the following R&D expenditures in the calculation of the taxable income amount, namely five insurance payments of research personnel, research instruments and equipment fee and maintenance fee, and new medicine clinic trial costs</p> <p>2) The part of employees' education expenditure that is less than 8% of overall salaries can be deducted from the payable tax amount. The balancing portion is allowed to be brought forward to the next accounting year</p> <p>3) When successfully industrialising technology achievement, tax of the share incentives for technology staff can be paid in instalments over five years</p>	<p>1) More items calculated and deducted in the calculation of the taxable income amount</p> <p>2) Higher rate than before (2.5%)</p> <p>3) Solved the problem that technology staff may need to pay tax before earnings</p>	<p>1) Expand to the whole country</p> <p>2) 3) Policies have been expanded to other science parks in Wuhan, Shanghai and Anhui.</p>
Stock-based incentive	Stock-based incentives for technology personnel who made outstanding contributions for industrialising technology achievements from firms, universities, or research centres in science parks (technology shares, share awards, share option, or stock appreciation rights)	Clear incentive methods	This policy has been expanded to other science parks in Wuhan, Shanghai and Anhui.
Research projects funds management	Indirect fees indemnification, special research funds released in phased tranches, increase pilot projects that	Pilot projects scope expands from national projects only to union-	-

	use research funds independently for the projects, union-supported by the Beijing government and other national departments, such as the Ministry of Science and Technology, the National Development and Reform Commission, Ministry of Industry and Information and Ministry of Health	supported projects with the Beijing government
Identification of high-tech enterprises	<p>1) Registered less than one year, but more than six months can apply for identification of high-tech enterprises. Do not enjoy tax preference;</p> <p>2) Core proprietary intellectual property rights increased for national new drugs, class-1 protected traditional medicine, certified national crop variety, national defence patent, technical secrets</p>	<p>1) Firstly consider firms younger than - one year in identification of high-tech enterprises</p> <p>2) Improvement and supplement of the contents of core proprietary intellectual property rights</p>
Build over-the-counter market under integrated regulation	Set experimental units in Zhongguancun Science Park for non-listed companies to transfer state equity rights. Provide service for non-listed high-tech enterprises in terms of share transfer and fund-raising. On January 2013, National Equities Exchange and Quotations is formally listed to establish in Zhongguancun Science Park	<p>1) In August 2012, “Three Board” first expands capacities, the scope includes other science parks in Shanghai, Wuhan and Tianjin</p> <p>2) In June 2013, “Three Board” expands capacities nationwide</p>

Source: Zhongguancun Policy Documents (Zhongguancun, 2010)

5.6 Summary

This chapter aimed to build an understanding of the research background, the distinct political system and the policies in China and Beijing. In regards to research question 1(i): How are policies implemented from policy documents? Four policy levels are indicated, namely national level, local level, science parks at a regional level, and individual science park level. National-level policy documents reflect a means of top-level design, which sets the goals, principles and tasks. The organisations cooperate with related organisations and set the goals for each local government. The local governments then set their own policies for the supportive means. The local governments are the main policy executors. But, as Beijing is covered by a large area of science parks, in most cases, science parks act as the main policy executors. The science park policies normally have more direct relationship with firms.

This chapter also explored the policies released in Beijing. It can be found that there is no clear separation between SME and entrepreneurship policies, and they are heavily overlapped. Since 2010, the policy trend has had a significant change. The first change was that government policy shifted from mostly focused on financial support to an integrated support method. The objective of China's twelfth five year plan (NDRC, 2010) from 2011 to 2015 required a higher quality growth. The importance of sustainable growth and protecting environment became the major topic. Thus, the second change was increasing support for certain industries (Table 5-4). Furthermore, the Beijing government policy also exhibits the same trend, with national policy emphasis. It will be further discussed in the interview chapter. However, from document data there shows a distinctive point of Beijing policy in that Beijing local policies prioritise firms inside a science park, inside an incubator, or receiving angel capital. Thus, instead of repeating the policies in Beijing, the Zhongguancun Science Park policies have been investigated. Specifically, since 2010 the Zhongguancun Science Park released new policies known as "1+6" policies (Table 5-5), which were designed to promote innovation. The science park policies can be seen as an integrated policy that covered financial policies, human capital policies and market-related policies. Finally, the new trend of policies increased support for intermediaries,

such as service centres, related institutions (e.g. law firms, and account firms) and incubators. In this sense, science parks should be considered as the intermediaries because they act a role to support firms. From the documents, the science parks show significant importance for the implementation of local policies in Beijing.

This chapter has presented the technology-related policies in Beijing based on the data from government documents, and built the background of China's distinctive political system. The next chapter will turn to an analysis of the qualitative findings from the interview process.

6. Qualitative Analysis: Interviews

6.1 Introduction

The previous chapter built an understanding of the research background, the distinct policy system and policies in China and Beijing. As can be seen, the businesses in China are highly correlated with policies. Although the launch of the reform and opening policies in 1978 has gradually shifted China's economy from a planned economy to a socialist market economy, there is an added qualifier following China's economic system, which is 'with Chinese features'. The term socialist market economies with "*Chinese features*" are characterised by a mixed system that presents the typical features both of market and planning economies (Aversa, 2013). In other words it can be said that the interactions between government and business are unique because of the "*Chinese features*". These concepts will be explored in more depth in this chapter.

The literature review brought several theoretical conceptualisations together: SMEs, entrepreneurship theory, innovation theory and policy, and highlighted the gaps in terms of research. The increasing significant role played by technology-based SMEs and the Chinese unique political-business interaction framework increase the need of a deeper examination of the effectiveness of policies on technology-based SMEs and entrepreneurship in China. Table 6-1 shows the objectives and research questions that will be examined in this chapter. This chapter is comprised of four sections and its structure is thematic. It begins with a discussion about the general entrepreneurial environment. The external and internal influential factors of entrepreneurship will be studied (research question 1.ii). This section is to display the entrepreneurship environment in Beijing, China. The motivation, opportunities and skills involved in entrepreneurial activities will be explored in this section. The sequential section develops the findings from the thematic analytical approach, in order to answer research question 2.ii. It will examine the limitations and barriers of starting and developing technology-based SMEs. Five main disadvantages of technology-based SMEs will be illustrated in this section, including financial limitations, market limitations, human capital, information and network, and internationalisation. The third key section is to examine the policies targeting at technology-based SMEs (research question 3.i).

Previous chapter had exhibited the new policy trend and policies what had been released in Beijing. This section will examine those policies with the interview data. The final key section is to answer the research questions 4.i and 1.i. The mechanism of science parks and the comparison between on-park and off-park firms will be explored. In addition, it will also provide evidence about how policies are implemented from policy documents, in light of the result from document analysis.

Table 6-1: Objective and Research Questions

Research Aim			
To examine the effectiveness of government policies on technology-based SMEs and entrepreneurship in Beijing, China			
Objectives	Research Questions		Sections
1) To identify the influential factors of entrepreneurship	i)	How are policies implemented from policy documents?	6.5.1
	ii)	How do external and internal influential factors affect entrepreneurial activities?	6.2.1/6.2.2/6.2.3/6.2.4
2) To identify the characteristics of technology-based SMEs	ii)	What are the limitations of technology-based SMEs?	6.3
3) To examine the effectiveness of policies targeted at technology-based SMEs and entrepreneurship	i)	How effective are those policies from entrepreneurs' perspectives?	6.4
4) To explore the differences between on-park and off-park technology-based SMEs	i)	What are the differences between on-park and off-park firms?	6.5

Source: Author's Fieldwork

The interviews took place in Beijing during the period from February to April 2014. There were 17 interviews in total and four types of respondents were interviewed. Specifically, the 17 respondents of the interviews include 7 entrepreneurs, 4 governmental officials, 5 managers of intermediaries and 1 scholar from the one of the top two universities who works in the same field as the author. The intermediaries here refer to the agencies who work to support technology-based SMEs. Two types of intermediaries, including Science Park and Service Sector,

were selected to take part in this research. What should be noted here is that those respondents from intermediaries are not under the charge of government, but work as a bridge between government and enterprises. As was discovered from document analysis, intermediaries play a vital role in implementing SME policies and supporting SMEs. This point is illustrated further by taking up the larger part of the interviews.

Table 6-2 presents in detail the demographic profile of the respondents. In the thesis, a short code of each interviewee will be applied instead of their actual name, E for entrepreneurs, G for government officials, A for agencies and S for scholars. As presented in the methodology chapter, the ethical considerations were taken into account before the interviews. All participants signed consent forms and provided information voluntarily, as shown in Appendix 2. All participants allowed showing their name in the research. There were four participants who refused to be audio recorded. For participants who did not wish to be audio recorded, I noted their words without skewing by my own understanding. More demographic information relating to each section about participants will be given in the following sections.

Table 6-2: Demographic Profile of Respondents

Short Code for Each Interviewees	Name: 17	Identity: 4 categories E: Entrepreneurs G: Government Officials S: Scholars A: Intermediaries	Enterprise Age (Years)	Recorded/Unrecorded
E1	Cai	E: Service	8	Recorded
E2	He	E: Service	2	Recorded
E3	Rui	E: IT	3	Recorded
E4	Tie	E: Manufacture	7	Recorded
E5	Xu	E: IT	3	Recorded
E6	Jin	E: Service	2	Unrecorded
E7	Jun	E: Manufacture	7	Unrecorded
G1	Wen	G		Recorded
G2	Yan	G		Recorded
G3	Meng	G		Unrecorded
G4	Lai	G		Unrecorded
A1	Li	A: Science Park		Recorded
A2	Ying	A: Service Sector		Recorded

A3	York	A: Service Sector	Recorded
A4	Zh	A: Science Park	Recorded
A5	Lou	A: Science Park	Recorded
S	Lei	S	Recorded

Source: author's fieldwork

6.2 Influential Factors of Entrepreneurship

As presented in the literature review chapter, entrepreneurship can be seen as the phenomenon associated with entrepreneurial activity (Ahmad and Seymour, 2008). This section is to identify the characteristics of entrepreneurship, in other words, to identify the external and internal influential factors of entrepreneurial activity. Accordingly, the external influential factors (entrepreneurship environment) and internal influential factors (entrepreneurs) will be studied in the following parts.

The literature suggested that overall economic, political and sociocultural factors can positively or negatively influence entrepreneurial activities (Gnyawali and Fogel, 1994). Shane (2003) also indicated that technological changes, political and regulatory changes and social and demographic changes can create entrepreneurial opportunities. To understand the entrepreneurship environment of Beijing, China, participants were asked to discuss their perceptions of the general entrepreneurship environment. To have a consistent understanding of the term entrepreneurship environment, the participants were asked to express their opinions on the strengths and weaknesses of the external environment conditions when they started and grew businesses.

The internal influential factors will be presented in the next section. The personal attributes, as well as the personal prior experience, will be presented to explore the internal influential factors.

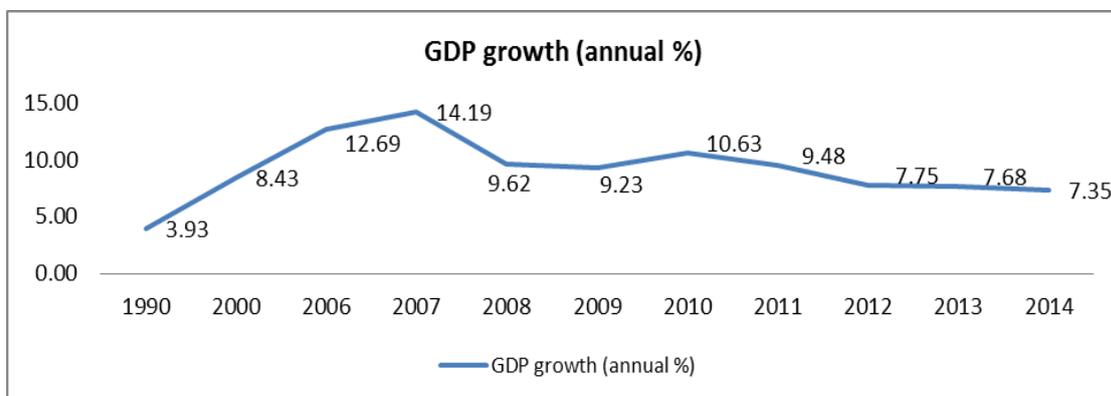
6.2.1 General Economic Environment

When asked about general entrepreneurship environment, most responses initiated the conversation from economic status. As suggested in the literature review, the economic environment, to some extent, affects the entrepreneurial activities (Wennekers, van Wennekers, Thurik & Reynolds, 2005). This section is to understand whether China's economic conditions positively or negatively affect entrepreneurial activities in Beijing. For so doing, the economic conditions of

China will be firstly illustrated and then the effects of the economic conditions on the entrepreneurship environment will follow.

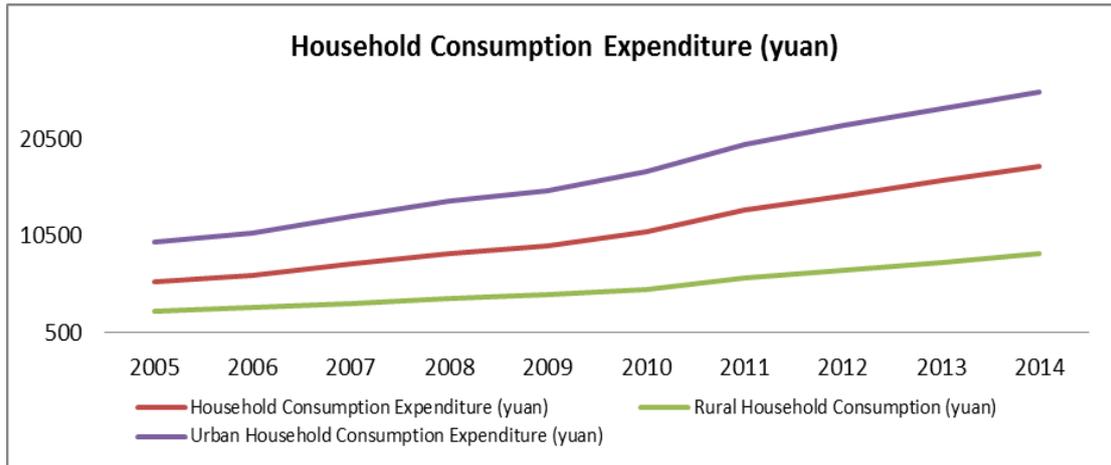
From the interviewees, it can be found that most respondents had positive perspectives on economic conditions in China. S [Interview] said that, from the documents, it can be found that the GDP increasing rate is 7%. Mostly, he thought highly of the Chinese economic development and said the infrastructure investment and promotion from government in recent years has provided conditions to have rapid development. However, he thought the rate was not that optimistic; 6% is a reliable rate for Chinese development rate, because some backwater cities may not be counted. There are huge gaps between rural and urban areas in terms of developing speed, income, consumption rate and government expenditure [Interview: S]. This matches the data collected from the World Bank Group. Figure 6-1 shows the annual GDP growth rate of the last decade. It experienced very high growth rate for five years after 2006 and, from 2012, it has maintained a stable increasing rate of around 7%. But the gaps between rural and urban areas cannot be neglected. From the data bank in the National Bureau of Statistics of China (see Figure 6-2 and Figure 6-3), the gaps of household consumption expenditure and the gaps of annual disposable income per capita between urban and rural areas have become larger for the last decade. As can be seen from Figure 6-3, the national annual disposable income per capita has only been recorded since 2013, which may not greatly affect the result in that the gaps became larger since 2005.

Figure 6-1: GDP Annual Growth



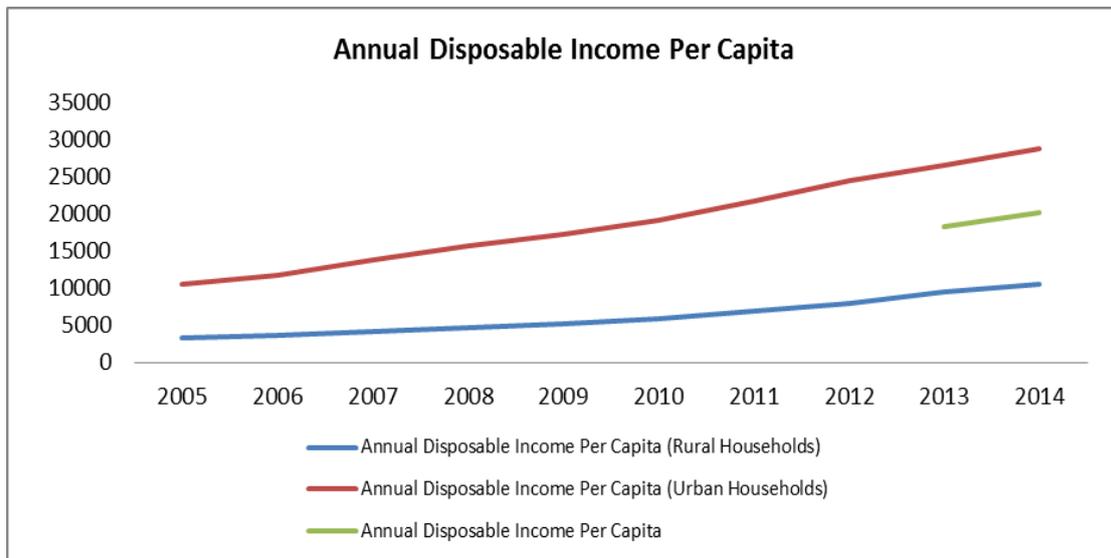
Source: (The World Bank, 2015)

Figure 6-2: Household Consumption Expenditure



Source: National Bureau of Statistics of China (NBSC, 2015)

Figure 6-3: Annual Disposable Income Per Capita

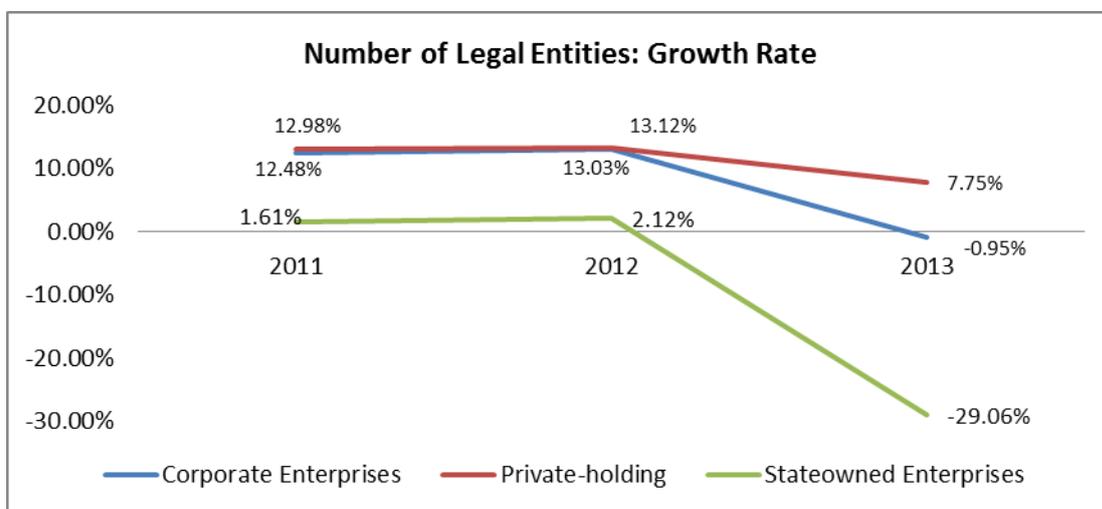


Source: National Bureau of Statistics of China (NBSC, 2015)

When asked how the economic growth affects the entrepreneurial activities, most interviewees believed there were positive influences from economic growth. G2 [Interview] stated that the gaps between poor and rich are huge, but it did not drag down developing speed. She mentioned that the market is the carrier of innovative companies; current market conditions provide huge opportunities for technology or innovative firms. Policy makers have been putting more efforts into creating a delightful more attractive environment for entrepreneurs to start businesses, especially for the technology or innovation sectors, for which increasing governmental investment and supportive policies have been. As the

market is active and huge, it provides tremendous development opportunities [Interview: G2]. The statistical data also support her views. Figure 6-4 provides the statistical data of growth rate in the number of legal entities. Due to the limitation of data source, it only shows from 2010 to 2013, but it is still found that the growth rate in the number of legal entities suddenly dropped from 13% to minus 0.95%, which means that, in 2013, more firms closed down than new firms started up. However, if we only focus on privately owned firms, it can be found that, although the overall market is not attractive for start-ups, there is still positive growth rate for the privately owned firms (7.75%).

Figure 6-4: Number of Legal Entities: Growth Rate



Source: National Bureau of Statistics of China (NBSC, 2015)

From the unrecorded interviewee, E6, believes that there are a lot opportunities in China, especially in Beijing:

I believe China will become the most powerful country by 2025, we can find opportunities and money everywhere in China, especially in Beijing. There are more and more people who start their own businesses, and they are very successful. As long as you have ideas, and are willing to do, many rich people are waiting to invest in you. [Interview: E6]

This is an exaggerated way to express his understanding of Chinese economic environment and entrepreneurial opportunities, but it can still be found that most people hold a positive view.

I feel the economic development rate in China is very huge. You also can see it from news. I think I can make more money if I start my own business than in being

employed by other companies. Why not? Everyone can grab opportunities, if you aware. [Interview: E5]

Both thought highly about Chinese economy, and they also believed that the development would bring more business opportunities for them. S [Interview] offered his assumption as to whether China can maintain this development rate for the following years.

The areas we normally notice are big cities, or relatively high economically-developed areas, but we have so many cities and towns that are like African cities. But, you know, no development itself provides the opportunities to develop. So, maintaining the GDP growth rate is possible, unless there are major problems. We can say there are loads of opportunities for SMEs now. [Interview: S]

However, there are not just positive views on the economic condition. E5 [Interview] used the economic perspective to express that the entrepreneurship environment in China is not optimistic. He mentioned that the degree of economic development is not strong enough to encourage more people to take the risk to start a business, because the salary for normal employees cannot support their business plans:

I think the entrepreneurial culture is worse than Korea. In China, the employers in the IT industry who work more than five years rarely start a business. But, like the UK, in Korea, if you have a goal, and save money for five years, you can probably start a business, can't you? [Interview: E5]

Accordingly, when only considering economic factors, interviewees believed that there are tremendous entrepreneurial opportunities, because the overall economic growth and the disproportion economies between rural and urban areas are what create more opportunities. Furthermore, the interviewees also considered the positive influences from other successful entrepreneurial activities, which not only encouraged more entrepreneurs to join the entrepreneurial groups, but also provided more entrepreneurial opportunities. However, with only the savings from prior jobs it is very hard to raise the initial capital, which may discourage the entrepreneurship.

6.2.2 Entrepreneurship (External Influential Factors)

As suggested by Reynolds et al. (2002), this section will present the influential factors of entrepreneurship apart from economic conditions, including social, cultural and political contextual factors.

E3 and G2 [Interview] expressed the entrepreneurship environment from the aspect of social factors. E3 believed that the social factor was not optimistic, as most people perceived that starting business in China was very hard:

Entrepreneurial culture is very important. In China, people think it is hard to start a business, so they are not willing to start it. Although we feel there is more people starting business, the ratio doesn't change.[Interview: E3]

But G2 [Interview] considered the social factor for entrepreneurship to be much better than before and that it will continue developing. Because of the development of information and technology, people have found it is easier to collect information and find useful resources, not just financial resources, sometimes they can also generate innovative ideas:

Nowadays, there are not only educated entrepreneurs. There are quite a lot of entrepreneurs who are not highly educated, but they got experience during their business activities. Nowadays, the internet has shortened the knowledge gaps. Although the technology is still lagging behind compared with developed countries, our internet, netizens and the market are the best. Many new ideas are generated in local markets. [Interview: G2]

Historical and social culture was concerned by G2 and E3 [Interview]. They linked the leftover notions from the past with the current entrepreneurial culture:

Chinese society used to be an agricultural society, we believed in the value of agriculture while we had a contempt for trade. We developed from Feudalism to Socialism directly, so the entrepreneurial environment was poor since ancient times. This is the perception problem, also a cultural problem..... [Interview: G2]

The traditional Chinese culture is avoiding risk. You know the dominance of Confucianism for almost 2000 years, the doctrine of the mean always affects Chinese people. Don't be distinct and pursue harmony, which is slightly in conflict with entrepreneurship. [Interview: E3]

It can be found that the interviewees above considered different aspects of entrepreneurship, including social factors and historical cultural factors. Most of them had a relatively negative attitude towards entrepreneurship with those aspects.

Another important factor is the political contextual factor, according to the interviewees. All of the responses which considered this aspect thought the policy makers took great efforts to build an entrepreneurial-friendly culture, and there

were two most frequently mentioned policies for encouraging entrepreneurial activities, namely simplifying start-up procedure, and lowering the registered capital standard.

From the interviews, it can be found that the start-up procedure itself has become much easier than before:

Yes, it must be much better than before. The entrepreneurial development environment is also better than before. For example, in the past, it was very complicated to do everything. You needed probably seventyish government official seals, now you need almost nothing. You don't normally need to visit an industrial and commercial bureau or the revenue authorities, even registering is much faster than before, and easier. [Interview: G2]

The barriers have become lower since last year. There are fewer vetting processes now [Interview: A4]

To simplify the start-up procedure, government set up an administration service hall in each city and, for big cities, each zone may have their own sub-bureaux, which reduced the time-consuming procedure:

You can do all the document stuff in one place instead of running over the whole city. It simplifies the start-up and maintaining business procedures a lot. Also, it reduces the enterprises' cost. In some ways, it can be a good point for firms' development. [Interview: S]

E3 [Interview] pointed out that on-park firms can enjoy convenient policies when they start businesses:

It's not about the length of time; you still need so many days for the start-up procedures. But, if you are in the science park, they [staff in science parks] do these things for you. More convenient than before [Interview: E3]

Many interviewees highlighted the new policy that lowering the registered capital standard can be seen as a significant sign of showing positive government attitude to supporting entrepreneurship. E1 and A2 [Interview] mentioned that the registered capital for new firms is only 1 RMB. It is very different from the original standard regarding the Company Law of the People's Republic of China (2006). The minimum registered capital standard used to be:

The minimum amount of registered capital of a limited liability company shall be RMB 30,000 Yuan (Article 26);

The minimum amount of registered capital of a one-person limited liability company shall be RMB 100,000 Yuan (Article 59-64);

The minimum amount of the registered capital of a joint stock limited company shall be RMB 5 million Yuan (Article 81).

These new policies have attracted more people to consider starting their own businesses [Interview: E5, G2]. However, the overall attitude from interviewees on the political factor was not very positive:

For Chinese firms, one of the hardest tasks is dealing with government. Government itself wants to create a preferable economic environment. But objectively, it doesn't work like you wish. [Interview: S]

There are several reasons from interviewees to explain why they thought the government activities did not totally meet their objectives – improve overall entrepreneurial environment. E1 and G2 [Interview] believed there was still a shady part when practising these promotional policies:

Actually, I don't think the policy works very well; there is too much shady part. The policy is going in the right direction, let's say, but the speed is too slow. The typical Chinese are still the same as before, and the overall context is like now, it takes time. [Interview: E1]

.....Currently, the intervention from government is too much. Government is everywhere, only people who have connections with government can run and grow business very well, and they can survive. So there is a system problem as well. [Interview: G2]

Furthermore, some interviewees also questioned the Chinese legal system and the unfair market competition with state-owned firms and large firms was mentioned by E3 and G2 [Interview]. They believed that there was still a lack of legal systems to protect relatively small and new firms:

Yeah, I think the most important reason is our legal system. No matter how good you are, how good an idea you have, you will be destroyed by oligopolies, or large firms; there are a lot cases like this. The Chinese doesn't care about intellectual rights; there is no power for small firms. So, fewer and fewer people want to start new businesses. [Interview: E3]

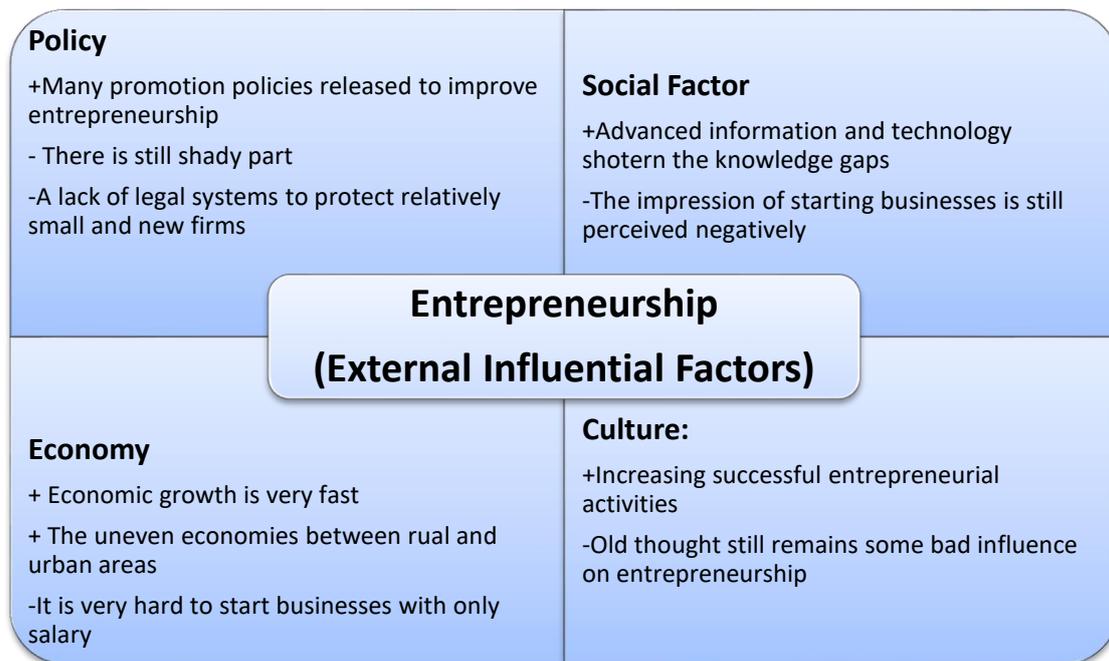
We have some problems. It is the state-owned firms, or the previous monopoly enterprises, the market competition or whatever is still not fair [Interview: G2]

As interviewees claimed, the Chinese government has made efforts to create an entrepreneurial-friendly culture, but the result is not as good as expected. Although they have simplified the procedure and cancelled the registered capital, there still exist some problems that prohibit the development of entrepreneurship. The cultural and perception problems, unfair market competition and some shady parts make it difficult to promote entrepreneurship.

The policies themselves are very macro-level, but starting a business is a very detailed activity. There is a big gap between them. These gaps can be caused by policy problems, executor problems, or enterprises problems. Starting a business, there are lots of things need to be considered, such as social security and treatment. Policies themselves cannot solve problems, but they can guide you a direction; you may not need them. So, starting a business in China is very hard. [Interview: E3]

Accordingly, Table 6-3 shows the results from the first and second sections. There were both positive and negative external influential factors in terms of policy, social factors, economy and culture.

Table 6-3: Entrepreneurship (External Influential Factors)



Source: Author's Fieldwork

External influential factors of entrepreneurship were presented in the previous part. There exist positive and negative influential factors. The author will more specifically analyse to what extent those influential factors create entrepreneurship opportunities. Some data from document analysis will be also taken as part of the analysis. As Shane (2003) suggested, technological changes, political and regulatory changes and social and demographic changes create entrepreneurial opportunities. Based on the interview and document data, mainly interviews, what changes generate entrepreneurial opportunities can be seen in Table 6-4. It can be found that the positive influential factors of entrepreneurship can mostly create entrepreneurial opportunities.

Table 6-4: Entrepreneurial Opportunities

		Interview	Document
Technological changes	Advanced information and communication	G2	
	Current market needs technology or innovative firms	G2	
	Promotion of the collaboration between firms and research institutions		(MOST, 2011b)
	Lower the registered capital	G2, A4, S	

Political and regulatory changes	Build science parks to promote clustering	E3	(MOST, 2011b)
	Reduce regulatory and procedural barriers to start businesses	E1, A2	
	Increasing support in the technology sectors	G2	(NDRC, 2010)
Social and demographic changes	Growing market	G2	
	Uneven development between rural and urban areas	S, G2	
	Due to the positive image of entrepreneurship, increasing numbers of people are willing to invest in entrepreneurial activities	E6, E1	

Source: Author's Fieldwork

6.2.3 Entrepreneurship (Internal Influential Factors)

The process of entrepreneurship initiation is affected by external influential factors, as discussed in the previous section, and also internal influential factors - personal attributes. The society, culture, intuition and person all together promote the process of entrepreneurship initiation (Morrison, 2000).

Interviewees said there were some specific personal attributes and prior experience which made them entrepreneurs. Five main characteristics were highly recommended by the interviewees, which are low risk avoidance, willingness to and enjoying making decisions, innovative, comprehensive talents and passion.

Low risk avoidance is most common attribute among the entrepreneurs. These people said that the most important thing was they did not fear failure: "If it's wrong, it's OK, we can start again. It's just for fun." [Interview: E1] or "The common characteristic of entrepreneurs is they all have courage to take risks." [Interview: E3]. However, as highlighted by McClelland and Winter (1969), the entrepreneurs do separate risk taking from gambling.

I do think about the risks, of course, but I do also estimate the profits. I do not fear failures. But it doesn't mean I will stupidly do everything that might be profitable. We do research, and tests, and ask experts as well. [Interview: E3].

The second common attribute is that the entrepreneurs are more willing to make decisions by themselves and also enjoy the sense of achievement from making decisions.

Things need to be done as my will, even if it was wrong at the end; I still prefer to do all things my way. [Interview: E1]

I like to make decisions, and I like to see when the decisions at the end are right. [Interview: E5].

As E3 [Interview] said, "I enjoy running my company. I can decide everything and enjoy the fulfilment."

The third attribute is they are innovative.

I know there are many problems in this industry, but I am trying to make a little change, and make it better. [Interview: E6]

The product renovation rate is very fast, so if you follow the trend, you can never catch it. You need to aware of future opportunities. [Interview: E5].

The fourth attribute is they are comprehensive talents.

I do marketing, I do research, and I decide strategy. I prefer this.' [Interview: E1]

They have a very accurate judgement on their financial situation, and will not start a business blind. [Interview: A4].

The last attribute is they have passion on their industry.

I love my work. It's interesting. [Interview: E1]

I want to make this industry better.' [Interview: E6]

As suggested by the "great person" school of entrepreneurship, successful entrepreneurs normally have high levels of vigour, energy, and are confident on their own abilities (Garfield, 1987).

Apart from personal attributes, the interviewees also highlighted the importance of their prior working experience. Table 6-5 indicates the benefits they got from the previous jobs, which eventually encouraged them start businesses.

Almost all responses agreed that previous jobs had positive effects on the business activities later on. More specifically, three entrepreneurs [Interview: E6,

E4, E5] stated that they got networks from previous jobs, and they believed that, to some extent, they got information and opportunities from those networks:

I used to work in a big company in the same industry. I quit my job when I thought I already knew enough people in this area. And now I still benefit from the network I got from my previous job. They share information with me, and sometimes we cooperate on the same projects [Interview: E6]

I got to know some people, and they turned out to be my sponsors at the end. Now they are shareholders, [Interview: E4]

Four interviewees believed the experience they got from a previous job had a positive effect on their entrepreneurial activities [Interview: E7, E3, E1, E5]. E7 [Interview] used to be a researcher and he claimed that he wanted to industrialise his research achievement. The knowledge he got from the previous job was the most important factor for the entrepreneurial activity. E3 [Interview] owned a business in America, but it closed down. He said he gained experience of running a business and, also, because he worked in the same industry, he had advanced knowledge from America that was newer than the Chinese market.

Table 6-5: Perspective of Previous Jobs

Interviewee	Previous Job	General perspective of previous job
E1	Small firm in the same industry	Experience (knowledge)
E2	Large firm in different industry	Not relevant
E3	Had a small firm in the same industry before this one	Experience (knowledge or technology)
E4	Large firm in the same industry	Network
E5	Large firm in the same industry	Network + Experience (knowledge or technology)
E6	Large firm in the same industry	Network
E7	Researcher in a science institution	Experience (knowledge or technology)

Source: Author's Fieldwork

6.2.4 Opportunities, Motivations and Skills

Previous sections have discussed the external and internal influential factors of entrepreneurship. Lundström and Stevenson (2005) summarised a more comprehensive framework of entrepreneurial process, which combined opportunities, motivations and skills. People who have the motivations to start the

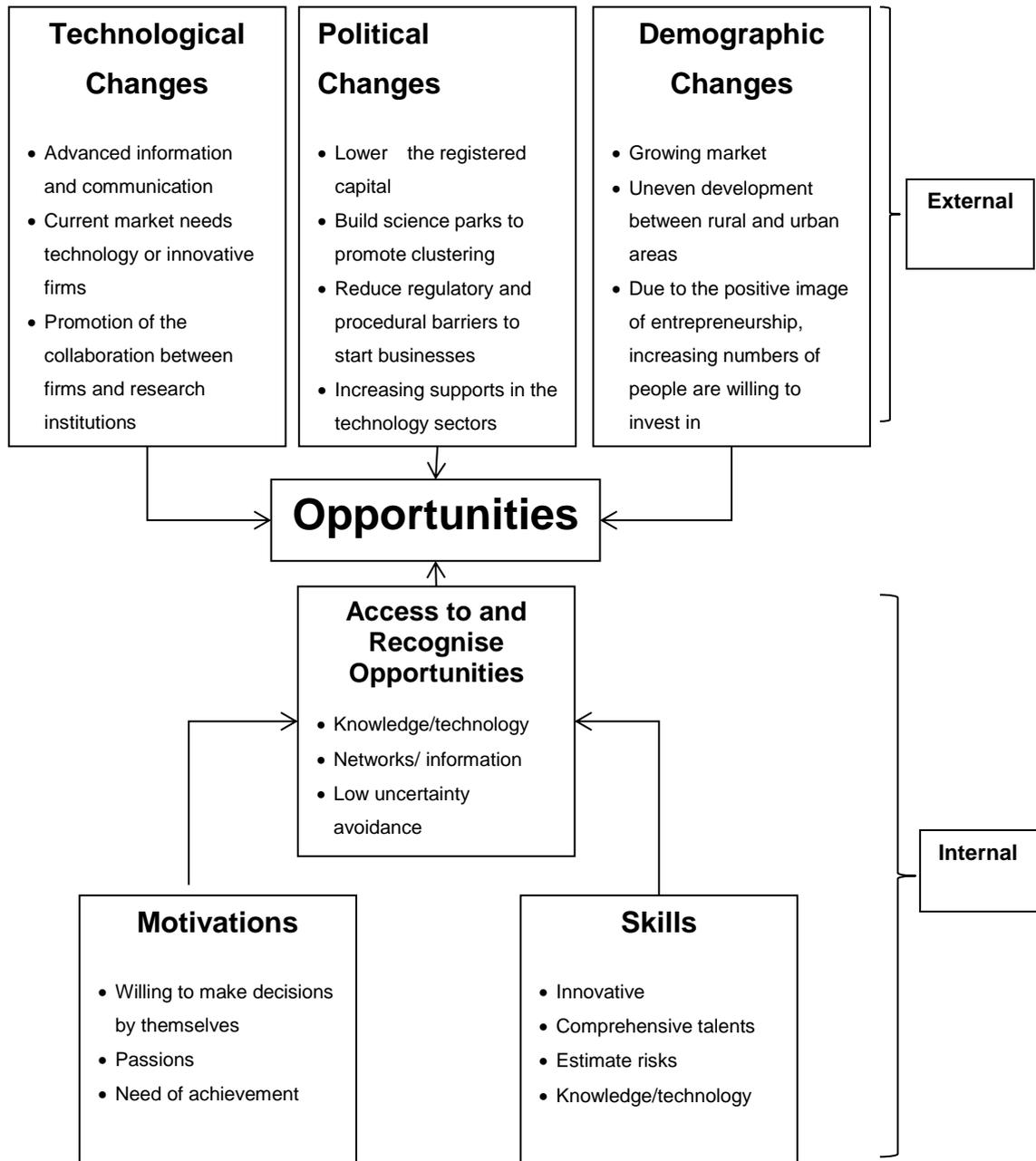
business, are aware of the opportunities around them and also have capabilities (skills) are more likely to be entrepreneurs. More specifically, the positive external influential factors create the opportunities, but these opportunities need people to recognise them (access and recognition), and be willing to start a business (motivations), and, finally, to have certain capabilities to make the business work (skills). Accordingly, the factors discussed previously are concluded in Figure 6-5. External influential factors was summarised in Section 6.2.2.

The previous jobs generated useful networks and information which provided the access to opportunities, and the new knowledge from previous jobs made them recognise the opportunities. Furthermore, the author also put low risk avoidance into this column, because if it is assumed that people can recognise the opportunities evenly, then those people who are less afraid of risks are more likely to approve the value of opportunities.

Furthermore, people who have the motivation to start businesses are mostly *“willing to make decisions by themselves”, “love what they do”, and “enjoy the sense of achievement”*.

Finally, without skills the business plan cannot be carried out. The author put *“innovative”, “comprehensive talents”, and “estimate risks”* into this category. Innovative should be one of the most important skills for entrepreneurs. Furthermore, entrepreneurs also require comprehensive skills, such as finance knowledge and technology. Finally, the author put low risk avoidance in the first category, but it does not mean that entrepreneurs do not need to consider risks. It should be an important skill for entrepreneurship to estimate the possible risks (McClelland and Winter, 1969).

Figure 6-5: Entrepreneurial Process



Source: Author's Fieldwork

6.3 Limitations and Barriers to Develop SMEs

This section will study the limitations and barriers for developing SMEs in China. As reviewed in the literature chapter, SMEs meet significant challenges because of their own disadvantages (North et al., 2001), higher risk, lower R&D abilities and less standardised financial statements. Especially for technology-based firms, as the proportion of tangible assets in total assets are much lower than normal

SMEs, they will meet more limitations when trying to raise money from external sources, and, thus, are more likely to meet financial problems (Carpenter and Petersen, 2002). This section is to explore the limitations met by Chinese technology-based SMEs in Beijing. The most significant barriers they meet will be identified.

Table 6-6 shows the development obstacles of technology-based SMEs. Interviewees were asked to rank the obstacles as they perceived them. The market-related obstacles were the most frequently mentioned obstacles during the development phase. In second place was financial capital, followed by human capital, network and information.

Table 6-6: Ranking of Obstacles

Interviewee	Identity	Enterprise Age	Obstacles (Ranking)
E1	Service	8	Human Capital, Market
E3	IT	3	Legal System, Financial Capital
E4	Manufacturing	7	Capital
E5	IT	3	Financial Capital, Market, Human Capital
E6	Service	2	Market
A3	Agency		Market, Others
A4	Agency		Market

Source: Author's Fieldwork

When considering the difficulties they met in the start-up stage, the most frequently mentioned difficulty was financial shortage. Thus, financial capital of start-up stage and follow-up stage will be firstly discussed in this section. The second section will introduce other development obstacles of technology-based SMEs. According to the responses, market barriers and fierce competition are the biggest difficulties for developing businesses. Other obstacles, including networking and information, human capital and internationalisation, will be also discussed in this section.

6.3.1 Financial Capital

During the development phase, two interviewees ranked financial capital as the biggest development obstacle. They explained it from two different angles, one is that there is financial shortage because the financial supply is less than

financial demand for technology-based firms [Interview: E4]; the other is the nature of technology-based firms, high risks, which makes it harder to raise money from external sources [Interview: E5].

Actually, investors are more likely to invest in technology-based firms. But the inputs and the demands are not even. For normal non-tech SMEs, they can maintain their businesses easily with borrowed money or retained profits. But, again, the businesses will not grow that much. For technology-based firms, if you have proprietary technologies, you are going to industrialise them. Once they are industrialised, people normally assume the prospects are bright. But the upfront investment is very huge. The approbatory degree from the investors cannot match firms' ideal degree. Thus, even if you can get funds, you'll still encounter the financial shortage. [Interview: E4]

In E4's view, technology-based firms can receive external investments easier than other firms. But, because of the industrial nature, the demand is much bigger than the supply. G2 also stated a similar opinion. The input and the demands are not balanced [Interview: G2]. Thus, the financial shortage is the most important obstacle for technology-based firms.

E5 also ranked the financial limitation as the biggest problem for development. But he interpreted it is because of the industrial nature - high risks.

For technology-based firms, people normally assume they are high risks, especially for technology-based SMEs. Unless you survive in the markets for a long time, and have reputation, then it may be different. However, the first several years decide whether you can survive or not; and also more need financial supports. But, basically, why will they invest in you if they have better choices, right? [Interview: E5]

The reasons why they had different explanations for this may be because they were in different lifecycles and industries. E4 is in the manufacturing industry and has been set up in business for seven years, while E5 is in the IT industry and the enterprise is three-year old. Firstly, the IT industry involves more intangible assets than manufacturing industry. For the investors, without professional knowledge of the IT area, it is hard to predict the future profits. Secondly, E4's firm is in the stable "*sustaining*" phase, so maybe has already built the reputation and credibility. Thus, he experienced more opportunities of external investments, while E5's firm is relatively new and may meet more difficulties to prove its potentials.

E3 ranked financial capital as the second important factor for development; he put the legal system in first place. The reason why SMEs meet this obstacle is because of the imperfect legal system.

Yes, of course technology-based firms are more risky. It is the industrial nature and firms from each country all meet this problem. But why Chinese technology-based firms are more affected by capital shortage? It is because of the legal system. For example, in America, the assessed value is approved by their business culture and regulation. They have a matured system to evaluate early stage firms, while we don't have that. So it makes more difficulties for early stage technology-based firms to raise money. [Interview: E3]

E3 explained the fundamental reason of the financial obstacle of technology-based SMEs. To some extent it explained both E4 and E5's opinions. Because of a weak evaluation system, there is the gap between approbatory degree from investors and firms' ideal degree, which creates the imbalance between inputs and demands. In addition, investors may generally assume new technology-based firms are highly risky because there is no clear evaluation system.

The following section will discuss different ways to raise money in both start-up and follow-up stages. At the start-up stage, there were only two out of seven entrepreneur interviewees who started their business with external financial source (see Table 6-7). Most of them started their businesses with self-raised funds. All of the entrepreneur responses mentioned that it is hard to raise money from external sources.

It is very hard to borrow money from banks. You need to show lots of evidence to the bank, such as you have the abilities to pay them back. [Interview: E1]

Why should other people lend you money, I mean banks and VC. You just started your business, or even have not started yet. It is easier to ask from family or friends. [Interview: E5]

Moreover, all privately owned firms used self- raised funds as their initial funds, while the state-owned firm or the privately owned firm transferred from the state-owned firm had other sources, such as state-owned firm investment or government investment. When considering raising money for the follow-up stages, there were various sources, such as VC, IPO, Bank Loans, Cooperatives and individual investments.

Table 6-7: Ways to Raise Capital in Start-up and Follow-up Stage

Interviewee	Ownership	Categories	Start-up Capital	Followed up stage capital
E1	Private	Service	Self-raised funds	Self-raised funds
E2	Private	Service	Self-raised funds	Self-raised funds
E3	Private	IT	Self-raised funds	VC/IPO
E4	Transfer from state-owned to private	Manufacturing	State-owned firm investment	Bank loan/government investment/IPO
E5	Private	IT	Self-raised funds	Cooperatives
E6	Private	Service	Self-raised funds	Individual investment
E7	State-owned	Manufacturing	Government Investment	Bank loan

Source: Author's Fieldwork

6.3.1.1 Start-up Stage

According to the interviews, there were some subjective reasons that entrepreneurs started their businesses with self-raised funds, which are:

Because they don't have financial scarcity; they can afford it. The people who want to start technology-based firms must already have an economic base, they have money. They quit from large firms, or research institutions, already got start-up capital. If they are overseas returnees, needless to say, their family must have money to help them out.[Interview: A4]

I got enough money to start my firm. Actually, there are some guys offering financial investment for my projects, but I didn't want it. First, I don't want them interfering in my business. Second, I don't know what to do with that much money yet. I need to have a big enough project to take the money, but don't have yet. So (...) [Interview: E1]

E3 [Interview] partly agreed about the comments of A4 [Interview] above that the entrepreneurs do have initial capital by themselves. But, on the other hand, he said there were some other objective reasons that were more important, which was supported by other interviewees. The first reason is the withdrawal mechanism in China is still incomplete [Interview: E4]. He said this especially pointed at government fund involved VC, state-owned firms' investment, and government direct investment.

There is lack of official documents to normalise the procedures, such as when to withdraw the money back, how to decide the profit. And also in what ways to manage the funds are still not very clear. [Interview: E4].

The second reason pointed out by A3 [Interview] was that the SMEs, especially technology-based SMEs, are normally considered as high risks.

They don't want to invest them. There are too many SMEs and it is hard to find which one is promising, and which projects are profitable. [Interview: A3]

The technology firms are normally with unmanageable risks. And for the banks, they want to control risks. For most high-tech firms, they don't have collaterals. It's too risky to lend money to high-tech firms. [Interview: E3].

The literature also suggested that high-tech industries are more vulnerable in the capital market, because of the market imperfection, than other sectors. Most high-tech firms hold intangible assets whose value is hard to be evaluated, and the return of investment on high-tech products is highly uncertain. As a result, high-tech sectors experience higher levels of information asymmetry, and, thus, there are more financing constraints and funding gaps in high-tech sectors (Carpenter and Petersen, 2002).

And, last, but not least, A3 [Interview] said that "there is very little possibility. If the entrepreneur has no kind of backstage, or guanxi, they can basically get no money from other sources." The sources he was talking about include government investments, banks loans and VC. As mentioned in the literature review chapter, guanxi can be in everyday life that one finds expressed among family, friends, relatives and neighbours, and between friendly but anonymous strangers (Yang, 1994). But also guanxi can be a so-called "*official discourse*". Within this type of guanxi, it requires necessary financial and moral cost (Hamilton, 1996). Guanxi mentioned by A3 [Interview] is the second type, which may sometimes require giving bribes to be quickly built. Carlisle and Flynn (2005) suggested that guanxi "costs" are significantly higher for private Chinese enterprises than all other enterprise types. In other words, it explains why there is less chance for private SMEs get external financial capital as it requires a guanxi network, but it is more costly for private SMEs to get access to. To some extent, it can be seen that start-ups and young firms have less access to government investments, as this policy can be seen as complementary for successful firms who already have reputation and financial capital.

Another reason was mentioned by one of participants, but it might need further research on. E3 [Interview] said that although government claimed that it has various financial support plans for technology-based firms, such as Torch Plan, 863 Plan and 973 Plan, the amount of money is very scarce. In addition, if a firm wants to apply for the government investment, it needs to have some matching facilities or funds:

When government invest money in you, they will ask that you should provide the same amount of money or more; the small firms or start-ups may not have that money. [Interview: G3].

It is the policy setting, but this reason has been denied by one of the policy makers:

Government has this policy. But if the firms are really engaged in scientific researches, they can definitely solve “the matching stuff” problems. I think the case you said doesn’t exist. You have abilities to do R&D, and are qualified to get financial support from government, you must be good enough.....the matching funds don’t mean your own money; you can borrow from banks. [Interview: G1]

Table 6-8 summarises the reasons technology-based SMEs meet difficulties in obtaining external financial capital at the start-up stage.

Table 6-8: Reasons that technology-based SMEs Meet Difficulties in Getting External Financial Capital at Start-up Stage

Reasons that technology-based SMEs meet difficulties in getting external financial capital when they start up		
Subjective Reasons	Objective Reasons	Other reasons
Potential entrepreneurs in China have their financial base already. No need to get additional external funds.	Withdrawal mechanism in China is still incomplete	It needs to have some matching facilities or funds to apply for government investment, which is hard for start-ups to provide
	They are normally considered as high risks	
	Lack of evaluation system	
	Without guanxi, it is hard for private enterprise to get access to external capital	

Source: Author’s Fieldwork

6.3.1.2 Follow-up Stage

The previous section introduced the reasons technology-based SMEs meet difficulties in getting external financial capital at their start-up stage. But, when they have built their businesses, and at the follow-up stage, there are various methods to raise capital (see Table 6-7). In other words it shows that it is easier for grown-up technology-based SMEs to raise financial capital from external sources than just start-up stage.

In the following section I will discuss the government investment/state-owned firms' investment, venture capital and individual investment. Bank loan was briefly introduced in the previous section and it will be further discussed in Section 6.4 SME Policy.

Government Investment/ State-owned Firms' Investment

Government investment and state-owned firms' investment have been put into the same category in this thesis, because they both use the state-owned capital, which, to some extent, means the invested capital is being monitored by government. The state-owned capital involved in state-owned companies may also provide human capital supports, for the purposes of monitoring and supervising.

I got the human capital supports as well. At the beginning, our financial staff were sent from that state-owned company. [Interview: E4].

It is based on the local policy to prevent a drain on national assets.

E4 [Interview] was the only interviewee among the entrepreneur participants who received state-owned capital in both start-up and follow-up stages. The reason that he had the government investment from the start-up stage was

I was one of the researchers in that state-owned company. When I showed them the proposal, they were willing to invest in me. [Interview: E4].

E4 [Interview] agreed that the people who had some sorts of guanxi with government or state-owned firms can find it easier to get access to government funds.

Guanxi in China should not be taken as a negative word; there is nothing bad about that. Just take good advantages of your social network. If you do not have the abilities, they will still reject you. [Interview: E4].

E7 [Interview] was another participant who used government funds as his initial funds. It can be found that both of them originally were state-owned firms, and E4 transferred from a state-owned firm to a private firm in the later stage. It seems that it is harder for privately-owned firms to get access to government funds; the reasons should be the same as explained in the previous section.

Venture Capital

If you categorise domestic venture capital companies by their ownership, there are three types of Venture Capital, including state-owned venture capital companies, venture capital companies with mixed ownership and private venture capital companies. As E3 [Interview] suggested that “90% of domestic VC has state-owned background”, it might be not exact number, but many researchers have also pointed out the similar statement that there is a lack of private venture capital firms (Bruton and Ahlstrom, 2003; Bruton, Lan & Lu, 2000).

There was one participant who had received foreign VC at the follow-up stage, and

It is hard for domestic technology-based firms to get foreign VC, there are no more than 10 companies all over China [Interview: E3].

E3 [Interview] mentioned that there were huge gaps between the domestic VC and foreign international VC:

(...) very different, they have totally different philosophy. Ninety per cent of domestic VC has state-owned background. The policy said venture capital firms should pay high attention to supporting technology-based firms, but actually it's not the case. I'm not saying the policy is bad; it's just because we start too late. It's not market-oriented at all. When you only have an idea, there is no possibility to get venture capital. It is very different with foreign VC. [Interview: E3]

As state capital involved venture capital has a large share in the Chinese venture capital market, it eventually exhibits the same problem as government investment or state-owned firms' investment. The funds will be monitored by government and the managers need to take responsibilities to ensure there is no drain on state

capital [Interview: A4]. This supported the statement of E3 [Interview] that “it is not market oriented at all”; the funds will finally go to grown-up and matured firms rather than start-ups. This point will be further discussed in the next section, SME policy.

From both A4 and E3 [Interview], it can be found that professional VC can bring great benefits for technology-based firms; valued venture capital can accelerate the development of technology-based firms. They can be market researchers, R&D advisers or social networking-bridge builders:

Some venture capital firms invest you 1 million, and take 10% of shares. They will tell you where your markets are, what your investment expectations should be for the coming year, how to develop, or how much the R&D expenditure should be. The investment organisations also provide services. They find you distribution channel, upriver and downriver enterprises, new products and technologies, or managerial personnel; all these things are invisible services. But they are very important for the development of firms. Only money is not enough. In China, there are a lot of venture capital firms, but there are not many firms that really can offer good services and patience. [Interview: A4]

The reason that E3’s firm can be listed in Singapore is because:

The social networks I got from the venture capital firms, not because of the money I got from them. They introduced some good cooperation opportunities in Singapore, and also helps us to meet the requirements of Singapore standard. [Interview: E3]

Individual Private Investment

Three interviewees said they received offers from individual for additional capital investment [Interview: E3, E6, E1], and only one of them accepted it;

I need to raise additional money to fulfil my plan, they want to invest in, and don’t want to involve in operation. It’s ideal. [Interview: E6].

All of them received similar offers; the investors offered money and decided dividend, without intervention in the business operation.

It is very easy to get the individual investment nowadays. There are many second-generation rich, they have lots of money and don’t know what to do with it.[Interview: E1].

E1 [Interview] stated the reason he did not accept the offer was that there was no clear future plan yet. It was not necessary or urgent to raise more money. E3 [Interview] also said that he preferred to get investment from professional teams, like venture capitalists, who can provide not only financial capital, but also other useful resources. It can be found that entrepreneurs have a clear future financial plan, as A4 [Interview] stated, they have an “accurate judgement of their financial situation”; they will not take investment without considering their development strategy. In other words this also supports the previous statement that it can be found that current entrepreneurs have become more mature than before.

Table 6-9 summarises the results from the interviews. The drawbacks of other financial sources can be seen from the table.

Table 6-9: The Drawbacks of Other Financial Sources

Government Investment/ State-owned Firms' Investment	Venture Capital	Individual Private Investment
Being monitored	Lack of private venture capital	Only invest money
Need some sort of connection with Government/state-owned firms	Causes the same problems as the government investment/ state-owned firms' investment	Cannot provide non-financial benefits
	Cannot provide non-financial benefits	

Source: Author's Fieldwork

6.3.2 Market Related Limitations

Table 6-6 ranks the obstacles according to the interviewees and market related limitation is the most frequently mentioned obstacle; five out of seven interviewees listed the market as one of the biggest obstacles for developing technology-based SMEs. Because of the industrial nature, new products and services require long research and development cycle, and development inputs are normally more than normal SMEs (Harter, Krishnan & Slaughter, 2000). With the advent of the age of information integration, the product renovation rate becomes an exponential function. Thus, it has more chance to be failed even before new products or services enter the market.

After they produced the products or services, they found the products or services were no longer meet the market demands. There may be new trends in the market,

then they need to prolong the period of design, which requires more money, more resources. [Interview: A4]

Thus, accurate and quick response to the market demand changes is a vital competitive advantage for technology-based firms (Zirger and Hartley, 1996). As A3 [Interview] said, “it is very important for technology-based SMEs to position their market” because the high inputs that have already been invested before making profits and the long R&D cycle “don’t allow us to fail in the market once we start to develop new products,”

Another market obstacle mentioned by these interviewees was the market environment which was full of unfair competition between small firms and politically-connected firms [Interview: E3, E6]. E3 [Interview] put this difficulty down to the imperfection of the legal system, and pointed out that the competition was stronger than the normal range, sometimes they were magnified by the anthropogenic factor.

E3 [Interview] concerned that the competition with politically-connected firms was a huge challenge for technology-based SMEs.

The reason that there is fierce market competition is because of the imperfect legal system. Some oligopoly enterprises [*Basically all state-owned firms*] make use of their advantages to destroy many innovative ideas, and make you unable to survive in this field. In China, there is no related law to prohibit it (...) they can make their own rules bypass the laws. [Interview: E3]

However, it should be understood that not only state-owned firms are politically-connected firms, a number of privately owned small firms can also build a sort of relationship with the local government.

There is nothing about fair. If it exists, then it will be a complete negation of past 10 years' efforts made by successful firms. [Interview: E4]

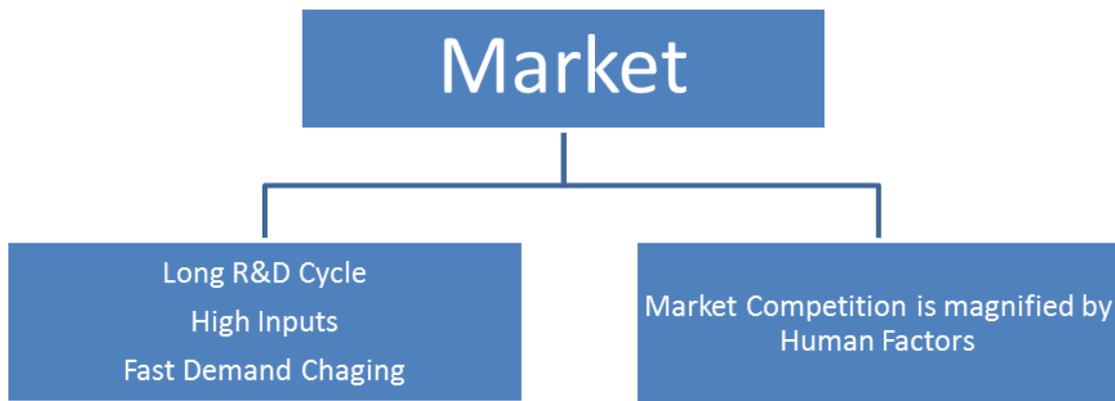
E4 [Interview] said that the only thing small firms should do was to keep their footing, found a way to grow their reputation and also built a connection with government.

E5 and A4 also interpreted the fierce market competition in other ways; SMEs rely on the outsourcing from other firms within their limited network.

(...) when we compete with powerful firms, firstly we are much worse in the company resume. They don't need to do anything and can get the projects. So most of the time, we need large firms take us into the projects. For example, there is a "Project A" in tender. We are at a disadvantage because of the scale. We have to indirectly get into the project through large firms. They gave us the permission to do one part of the project. Of course they took a big cut (...) we cannot get into the project at all. We can only rely on large firms. But the profit will be fewer than what it should be. [Interview: E5].

Thus, even if large firms do not abuse their monopolistic power, they still stand in a better position than small firms without any connections.

Figure 6-6: Market- Related Obstacles



Source: Author's Fieldwork

Figure 6-6 shows the main limitations the technology-based SMEs meet. The first limitation, "*long R&D cycle, high inputs and demand changing*", and the second limitation, "*market competition is magnified by human factors*" will be discussed more in the following part. The first section will discuss the R&D-related issues and the second section will have a comparison between large firms and small firms.

6.3.2.1 R&D

As discussed in the previous part, the market obstacle of technology-based SMEs originally stems from their industrial nature, high input and long R&D cycle. Thus, it is necessary to understand the R&D capabilities of technology-based SMEs in

China. To do so, the major processes of R&D within Chinese technology-based SMEs will be displayed in the later part.

To investigate the relationship between R&D and product industrialisation, or market, firstly I will discuss the R&D processes. From the interviews, technology-based SMEs do not share a single research mode. The R&D activities can be conducted by the units within the firm, or be out-sourced from other research centres, universities, agencies, or other domestic or foreign firms [Interview: E1, S, A1, E3, E4, E5, G2, A4]. However, most of them said the research modes of technology-based SMEs sometimes have a mark to follow [Interview: S, E4, G2, and A4].

At the start-up stage, the R&D activities of technology-based firms normally rely on external sources, like universities or individual research achievements. At the early stage, no one really cares about the property rights. But, when firms grow up, reach a certain extent, their technology becomes more standard. It might be independent R&D, or purchased formal research achievements. [Interview: S]

When firms just set up, they normally try to minimise costs. They will try to get technologies, most of which are not matured technologies which are ready for industrialisation, from universities or research centres at low price or without paying [Interview: S]. When firms grow up, they accumulate experience and capital. They will know more about markets and more understand what products are demanded in the markets. Then they will try to input more to do R&D or purchase technologies [Interview: S]. E4 [Interview] also mentioned this point. But, rather than the life cycle of firms, he highlighted it was more influenced by capital ability. When firms experience shortage of cash flow, they will try to introduce technologies and industrialise rapidly. But, he shares the same opinion with S [Interview] that, when firms grow up and accumulate experience and capital, they will try to do independent research or cooperate with external research institutions.

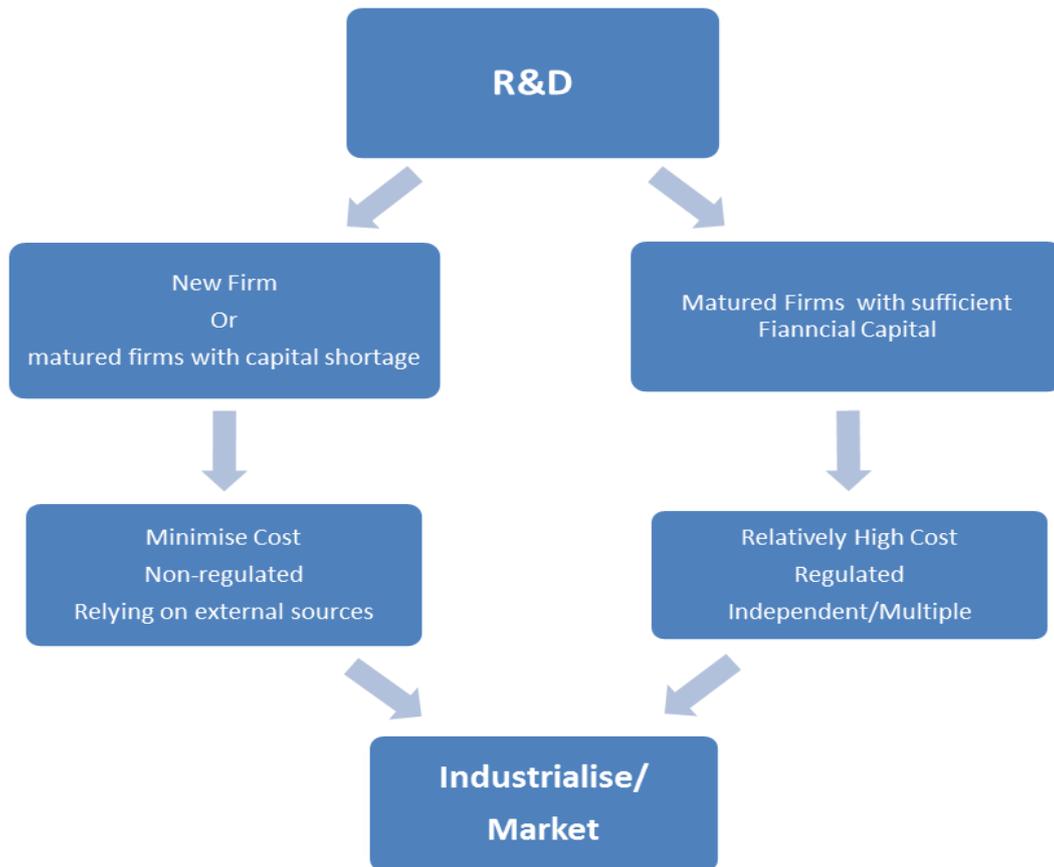
There are a few advantages of independent R&D [Interview: E4], the control of products will be much better than other R&D activities. As E4 said, the firm joins all phases from the market research, products or service design, to market promotion. They will be more familiar with the advantages and disadvantages of products or services and, thus, can adjust at any moment. However, there is no obvious evidence to say which R&D activities make firms more successful

[Interview: A4]. As discussed in the literature chapter, the return on the social level is higher than the private level when doing R&D (Hall, 2002); thus the R&D is generally under-investment. Different R&D processes depend on different strategies of firms [Interview: E4]. There are a number of uncontrollable elements to decide whether the new products or services are successful or not. For example, uncertain results of R&D, uncertain results of government approval and uncertain market responses [Interview: E4].

Accordingly, although there is no single R&D mode for the technology-based SMEs, it still has a mark to follow. Figure 6-7 illustrates the relationship between R&D and industrialisation/market based on the interview results. New firms and matured firms with capital shortage share a similar trajectory, while matured firms with sufficient financial capital are the second group. For the first group, they both have the need to quickly industrialise and minimise the cost. To do so, most of them will rely on external sources for R&D rather than independent. However, the acquisition of R&D sometimes is not regular. It is a quick way for these firms to industrialise, but, as presented in last paragraph, it is not as stable as independent R&D. Moreover, as the second group has no problem with their finance, they will follow a relatively stable way. These firms may do independent R&D, but some of them may also rely on external sources. However, their technology will be more standard and have relatively higher costs, and it will also take a longer period to do R&D.

Hyytinen and Toivanen (2005) suggested that even just imitating a new invention is not costless; it costs 50-75% of the cost of the original invention. However, from the interviews, it can be found that new firms and mature firms who have capital shortage are more inclined to rely on external sources, and with low pay or without paying. It exhibits a different view from the literature. It implies that the technology market in China is less matured and non-regulated. There is still a great possibility that potential entrepreneurs copy the intellectual property without proper means. But, in the meantime, interviewees stated that firms with sufficient capital normally adopt technology achievements formally or do R&D independently. It can be deduced that, firstly the intellectual property system drives to maturity and, secondly, the supervision system of government is stronger for matured firms than for firms in the infant stage.

Figure 6-7: R&D Procedures



Source: Author's Fieldwork

6.3.2.2 Comparison with Politically-Connected Firms

The second element that can be seen as a market obstacle for the development of technology-based SMEs is the fierce market competition with politically-connected firms. Two main disadvantages of SMEs have been mentioned by interviewees, a) unfair market conditions [Interview: E3, E4, E5, A3], and b) harder to get access to external supports or capital [Interview: E2, A3].

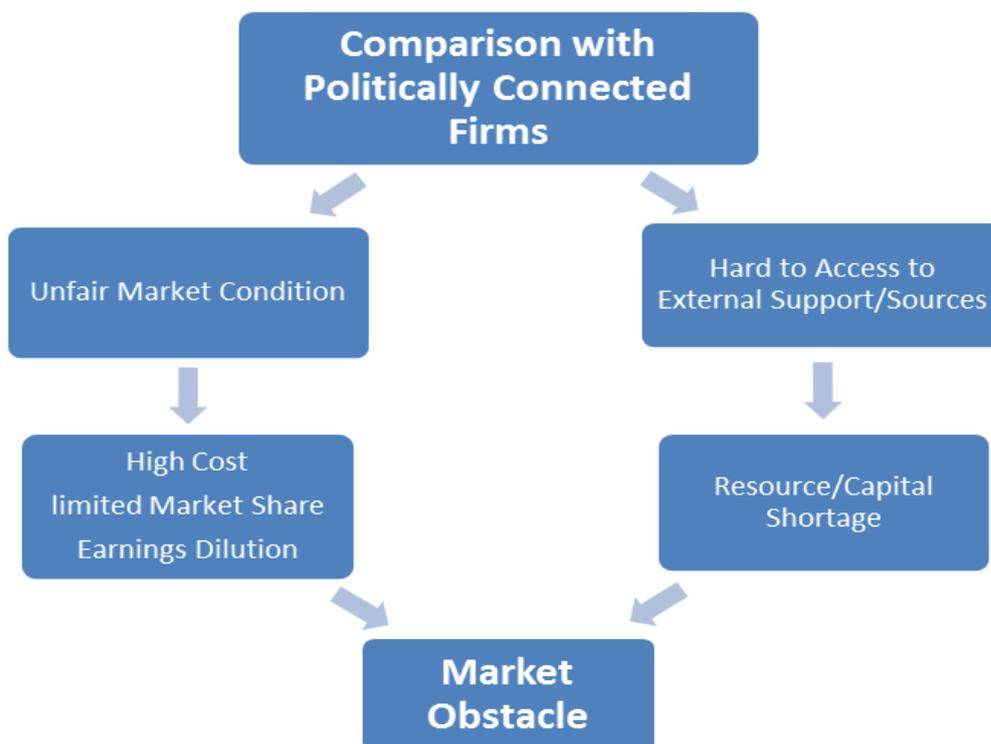
Unfair market condition sometimes is caused by factitious factors. The politically-connected firms can make their own rules, bypass the laws and make the market condition more difficult for technology-based SMEs [Interview: E3]. As the literature suggested, as key resources are controlled by the state, the political connection helps firms to secure favourable regulatory conditions (Agrawal and Knoeber, 2000). To get the same degree of resources, the normal technology-based SMEs sometimes need higher cost than the firms with political connections. But, even if the market is not affected by factitious factors, the nature of their

scale makes SMEs hard to gain valued long-term customers. Most of their businesses rely on the outsourcing from other firms, which dilutes the earnings [Interview: E5].

The second frequently repeated disadvantage is that it is hard to get access to external supports or capital. Empirical data from Mian and Khwaja (2004) also suggested that politically-connected firms receive substantial preferential treatment. As A3 [Interview] said, “Normal SMEs compared with politically-connected firms have not built a credit base yet. For government or service institutions, selecting connected firms who already have matured products and successful experience is more reliable and has fewer risks.”

On the other hand, it shows that normal technology-based SMEs are very easily overlooked: because, as A4 [Interview] put it, “it is easier to support them. Who will care you if you are tiny firms?” As A4 [Interview] stated, most institutions pursue profit maximisation; supporting politically-connected firms is less risky and has lower choice cost and lower cost of supervision. As a result, SMEs are overlooked by government and service institutions.

Figure 6-8: Comparison with Politically-Connected Firms



Source: Author's Fieldwork

As Figure 6-8 illustrates, there are two main disadvantages for normal technology-based firms compared with politically-connected firms. First is the unfair market condition because the political connections can help firms to secure regulatory conditions which are more beneficial to the politically-connected firms, which causes unnecessary costs, limited market share and earnings dilution. The second disadvantage is hard to access external supports because it is convenient and costless for external source to choose politically-connected firms, which means the normal technology-based SMEs meet a resources and capital shortage.

6.3.3 Network and Information

Not all interviewees mentioned networking and information related obstacles. Even listed interviewees above did not talk much about them. It can be found that, from the perspective of agency, the information is an important affecting factor for the development of SMEs. They highlighted that on-park and off-park firms can access different levels of information about markets and government support [Interview: A1]. It is speculated that few entrepreneurs mentioned information was that they did not realise how important advanced information is. Off-park firms do not know the existence of useful information, while firms inside of science parks do not know the value of information passed by science parks [Interview: A1]. A3 [Interview] did not agree about the information being different between those two groups. He stated that, except for some industries that need high clustered level, the information is no different between firms inside and outside of a science park, due to today's highly developed information systems. Instead of information, he stated that the more important thing is network. How entrepreneurs build up their network and the quality of network is much more important than information. The useful information can come along with a qualified network.

A4 [Interview] also said information is a very important affecting factor for the development of SMEs. He interpreted it in a different way. He considered the science park as one important source of "Network". The science park is a bridge for useful connections and information. He believed that on-park firms can more easily get access to useful information and network.

Thus, the network and information can be seen as the same element. For the off-park firms, they can get useful information from their own network. But the

network is based on their personal network, which might not always deliver useful information. For the on-park firms, they can get access to information from both personal networks and science parks. Science parks play a role in delivering useful information and screening out unnecessary information. In this sense, it lowers the cost of technology-based firms in selecting useful information. On-park firms can get access to useful network and information in a more efficient way. This part will be further discussed in Section 6.5 Science Park.

6.3.4 Human Capital

Two interviewees, E1 and E2, mentioned that human capital is a very important element for SME development. Interestingly, they are both from service industries that have no need of high technology intensives. They highlighted the importance of human capital, particularly in smaller technology-based firms. From their perspectives, smaller firms have fewer employees than larger firms; they cannot afford human capital from all the disciplines they need [Interview: E2 and E1]. On the one hand, the employment of complex talents is an efficient way to save costs, on the other hand, the streamlining of human capital may promote operational efficiency [Interview: E2].

Other interviewees from industry did not mention anything about human capital, which was different from what the literature suggested. The literature presented a positive relationship between human capital, especially knowledge-workers and innovation (Thurow, 1996). In the internationalised economy, high quality human resources with a higher education and/or higher theoretically well-equipped are increasingly important (Quinn, Anderson & Finkelstein, 1996). But, surprisingly, the interviewees from high-tech industries did not mention anything about human capital. It might imply that, firstly, human capital in these firms is already high quality so that they do not perceive human capital as a limitation, or, secondly, these firms are less innovative so that their innovation might initially adopt from external resources. The second inference is more likely to be true for these firms as most of them said they met R&D limitations.

6.3.5 Internationalisation

Surprisingly, when asked about the main barriers to develop technology-based SMEs, no single response mentioned internationalisation. Only when I pointed out “what do you think about internationalisation?” would they start to talk about

this part. Many literatures suggested that increasing numbers of smaller technology-based firms go into the global market since their infant stage which is omitted by traditional stages of internationalisation (Fillis, 2001). The studies of Moen and Servais (2002) and Rennie (1993) suggested it has become quite universal that technology-based firms are “born global”, because of the fast innovation development around the world (Knight and Cavusgil, 2004). As one of the distinctive characteristics of technology-based SMEs, they are more likely to be internationalised in an earlier stage compared with non-tech SMEs, the internationalisation barriers and the policies will be also studied in this thesis.

A report from OECD (OECD, 2009) suggested there are a number of uncontrollable factors in global markets. The different governmental regulations, currency valuations and distribution systems all can be the barriers for technology-based SMEs to internationalise. According to the interviewees, the most frequently mentioned barrier is the different regulations.

We start to enter international market quite late. In the past, China is closed economy. We don't know game rules, regulations, and languages. It restricts internationalisation.' [Interview: G1]

Different cultures, regulations, geographical long distances, make it very hard to trade with foreign countries. [Interview: S]

Moreover, almost all respondents acknowledged that there exists a huge gap between Chinese and advanced technology in developed countries.

Even Chinese technical personnel prefer to work in foreign firms and research centres. Because there is better equipment and more advanced techniques. [Interview: A4]

Some other reasons that firms did not go global were:

The Chinese markets are quite big. Most products can be sold in the local market. [Interview: S]

It's already hard enough to survive in the local markets. Entrepreneurs really don't have time or capabilities to think about internationalisation. [Interview: A1]

Chinese are clever and are willing to learn. But Chinese don't pursue perfection. If it is profitable, then it's enough. It's different with foreign culture. [Interview: E4]

The angel or VC is too weak in China. They cannot help at all. [Interview: A4]

It is not a very familiar topic for the interviewees and it could be said that Chinese technology-based entrepreneurs may not be aware of the opportunities abroad. As Andersen (1993) suggested, the decision of expanding into the international market itself can be seen as innovation. In this sense, Chinese entrepreneurs were satisfied with the current situation, and had lack of willingness to have an innovative activity. In brief, the barriers to internationalisation include different regulation, technology gaps, big local market, lack of capabilities, no long term plan and weak VC.

6.4 SME Policy

The previous section had an overview of the main development obstacles of technology-based firms. To remove these barriers, policy makers have released a number of policies or regulations. In this section, the policies and regulations will be illustrated to investigate how the policies work on removing these barriers and if the policies meet the needs of entrepreneurs in a technology-based industry.

The Chinese policy process is from local experiment to nationwide (Heilmann, 2008). The Chinese political system is centrally-controlled regional decentralisation and the policy design is based on the methods of parallel research and repeated experiment (see **Error! Reference source not found.**). The previous chapter used only documents collected from government to understand the policies in China. This section will base on the interviewees' perspectives on policies to understand how the policies in Beijing work.

6.4.1 Finance

This section was to understand the financial related policies in Beijing and their drawbacks.

6.4.1.1 Financial Policy

Finance-related policy was the most frequently mentioned supportive method from the interviews. When asked about the major policies benefiting technology-based SMEs, all responses started from finance-related policies. S [Interview], as a professor specifically in this field, provided a very systematic introduction about finance-related supports, which covered most of the interviews in this topic. Thus,

the author will use the knowledge from Prof Lei about finance-related policies to provide an overview of these policies.

From the interviews, two types of financial tools are used by policy makers, namely direct financial supports and indirect financial supports. Direct financial supports basically include direct investment with low payback, or directly given away for free. Indirect financial supports are relatively newer methods for policy makers, which indirectly support technology-based SMEs by financially supporting intermediaries, such as banks, fund raising institutions and credit guarantee institutions.

Specifically, combining the information from the main documents and interviews, there are two major direct financial supporting tools. The first way is fund-supported programme. This fund is for supporting technology-based SMEs to accelerate the process of industrialisation:

The first plan is a fund-supported programme. For example, Torch Plan, Spark Program; the National Development and Reform Commission also have a programme to support high-tech firms' industrialisation, I can't remember the name of the plan, but actually it is fund-supported programme; there is a special fund to support SMEs. The high-tech firms who want to industrialise their technique can apply for these funds. Some scientific research institutes who want to industrialise their high-tech achievements and start a business can apply for these special funds.

[Interview: S]

The second way is innovation fund. The fund is available for the technology-based SMEs who have self-development projects which meet the policy requirements.

For example, there is fund managed by the Ministry of Science and Technology called SME innovation funds. It used to be two billion per year, now it is probably more than that. [Interview: S]

As shown before, the objectives of these funds are: a) speeding up industrialisation, and b) promoting innovation. In order to achieve these goals, government has used at least three ways to distribute these funds to qualified technology-based SMEs, and does not ask for repayment from receiving firms:

There are three ways to use the funds. The first one is direct investment. Normally the project should require less than 1 million Yuan, and will need expert evaluation. The second one is subsidising interest payment of loans. The projects will normally

need a lot money, more than three million or five million. Government can't give that much money because it needs to support other innovative firms as well. So, if your project has been proved by expert evaluation, and they assume your project is profitable, government will encourage you to get a loan and they will pay your interest. Government will also recommend you to local banks. The third way is participation. If it's a project needing more than 10 million, and has been evaluated, the government will participate. But actually, the government only uses the first two ways. [Interview: S]

The first two distribution ways are most common for the current Chinese government, and the third way, participation, is rarely used by government. The reason is that:

Every year, there are too many firms applying for financial support, it is very hard for government to manage; management fees will be a huge burden as well. It can only be a conception, when government tried to do so, it couldn't afford it. But one day, it may try to do that when we get a better management team or the project itself is super good. [Interview: S]

However, actually for local government, participation is not a very rare action [Interview: G3]. But there remains some problems that are hard to distinguish from state-owned firms, state-holding firms and joint ventures. It shares similar drawbacks to government capital-involved firms. As a result, not only from the government side, but also from privately owned firms' side, they are not willing to have participation.

In terms of indirect financial supports, there are also two common ways for implementing them. The first way is, instead of directly giving money at the firm level, is to invest money into investment companies. This is usually called a guiding fund. The second way is to encourage banks to provide loans to technology-based SMEs.

More specifically, the first indirect financial support is:

Encouraging the fund of investment companies. Government invests a certain amount of money and fund an investment company with one or more local private firms. This is participation and these type of investment companies will more tend to invest in SMEs than normal investment companies. [Interview: S]

The operating function is not greatly different between government capital-involved investment firms and private investment firms. However, the target firms and the investment stage are different.

Private investment firms are more sensitive to the market. They prefer to diversify their investment, and invest in very early stages of firms; thus, the amount of money is much less than government background investment firms. Government money-involved investment firms are much more cautious, they prefer to invest in matured firms, at least at the time you can see it is definitely profitable. So they will invest more money, but will own fewer shares than private investment firms.[Interview: S]

The CEOs of government money-involved investment firms take more pressure than their counterpart, so they become conservative investors. They are under pressure to make money for government without taking too many risks. As a result, their basic principle is “does not lose money”.

The second way is to encourage banks to provide loans to SMEs. It is not required, but the banks that provide these loans to small firms can get other benefits from government, such as getting preferential treatment when they apply for national financial qualification.

Table 6-10 summarises the main financial support tools, their purposes and the executed solutions.

Table 6-10: Financial Supports

Financial support	Tools	Purposes	Execute Solution
Direct Financial Supports	Fund-supported programme	High-tech achievement industrialisation	1. Direct Investment
	Fund	Promoting Innovation	1. Direct Investment 2. Discounted Loan 3. Participation
Indirect Financial Supports	Guiding Fund	a) Encourage the funding of Investment Companies b) Invest in some Service Institutions	Invest investment companies/Service Institutions
	Bank loans	Encourage banks to provide loans to technology-based SMEs	Preferential treatment for banks with certain

Source: Author's Fieldwork

Direct financial supports used to be the main supportive method for government, but the trend has now slightly changed. The first change is the target groups:

Before, we only have one supporting method, direct investment. But now, we decrease the amount of direct funds, but still keep it. Mostly, our target groups changed. We invest intermediaries or public services agencies instead of firms directly. Because the intermediaries can cover thousands of SMEs, with the government financial support, they can provide services with lower costs and profits. [Interview: G2]

The second big change is the ways to support firms, according to G2 [Interview] “instead of direct investment, now government is more willing to be a participant.”

This is different to S's perception. However, G2 explained this point:

It's different to the previous participation. First, it doesn't make a dilution. Second, they do not control or manage firms. They just make a contract and decide when to input money and when to exit. And how much profit should be paid. [Interview: G2]

But the participation is still not yet well implemented, because the input and exit procedures are not clearly designed. Firms are not willing to take the risks, under supervision and with no clear exit policy, to receive government money.

However, it will be a new trend for governmental supports, and public officials work on to make a better design on this. [Interview: G2]

Accordingly, it can be found that, instead of directly giving money to firms, government prefers to flexibly use government capital. The government capital is used to pursue incentive mechanisms, rather than hard policy, directly distributing money at firms' level. In addition, government also pursues minimum profit, but this cannot be seen as the main principle of government investment.

6.4.1.2 The Problems of Financial Policy

From the interviewees, it can be found that, although a number of financial policies have been designed by government, the effects of these policies are not as good as expected.

It is important, but not the most important.....the amount of money is very limited, very small, it is almost useless for firms. [Interview: E3]

It can only make firms go slightly further. The effect is almost nothing. [Interview: E4].

From the perspectives of support receivers, it can be found that the amount of policy supports did not really help the development of technology-based SMEs.

This section will illustrate the problems of financial policy mentioned by both policy makers and agency managers. From the perspectives of public officials, there existed some problems when designing policies. First of all, there was no follow-up supervision:

Government introduced some financial policies to support firms, but there is no follow-up supervision. It's hard to evaluate the effects of the fund. [Interview: G1]

Because there was no follow-up supervision, there were many chances that firms took the money and did not work on the things they promised to do when they applied for the supports.

They can say the projects are failed, and government doesn't need to know what really goes on. [Interview: E3].

Thus, policy makers do not know the effects of the policies. It is worth doing if the firms really do the researches or industrialise the technology achievements. But, given the lack of follow-up supervision, some people may like to take risks to apply for additional capital without any substantial research.

Second, it was difficult to select worthwhile firms:

China has no credit evaluation system. Each government department has their own evaluate system. Historically, Chinese never has quantitative standard, every standard is flexible. It makes the quality of supported firms is uneven.' [Interview: G2].

As the evaluation standard is quite blurry, there are many chances that some firms can rely on guanxi with some policy-related people to get the supports. Some valuable projects can be neglected because there are limited funds available.

Third, the functional overlap among different departments makes it highly possible to have some firms receive more than one support, but some valued firms receive nothing.

Because we don't have a comprehensive department for SMEs only, all departments have some functions somehow related to the development of SMEs.

[Interview: G2]

From the perspective of agencies, there are some problems when following these policies. First, because the national capital was involved, the agencies were more cautious.

Every agency is an enterprise as well. Their principle is to maximise profit. We got money from government, but we needed to balance between "not lose money" and "support small businesses". It is very hard. The money will eventually go to big and successful firms. [Interview: A4]

Second, the same as the second point made by policy makers, it was very hard to measure whether the firms were valuable or not.

It's very hard to measure if the firms are valuable to support. First, most small and new high-tech firms have no financial statement, so how do we know if they are reliable or not. Second, most projects are still in a very early stage. Sometimes there may be only ideas. How do we know if they can succeed? [Interview: A3]

It can be found that there is lack of a clear evaluation system, as presented by policy makers, but, on the other hand, it also shows that these agencies are very cautious; they are not willing to put these early stage firms on the supporting lists.

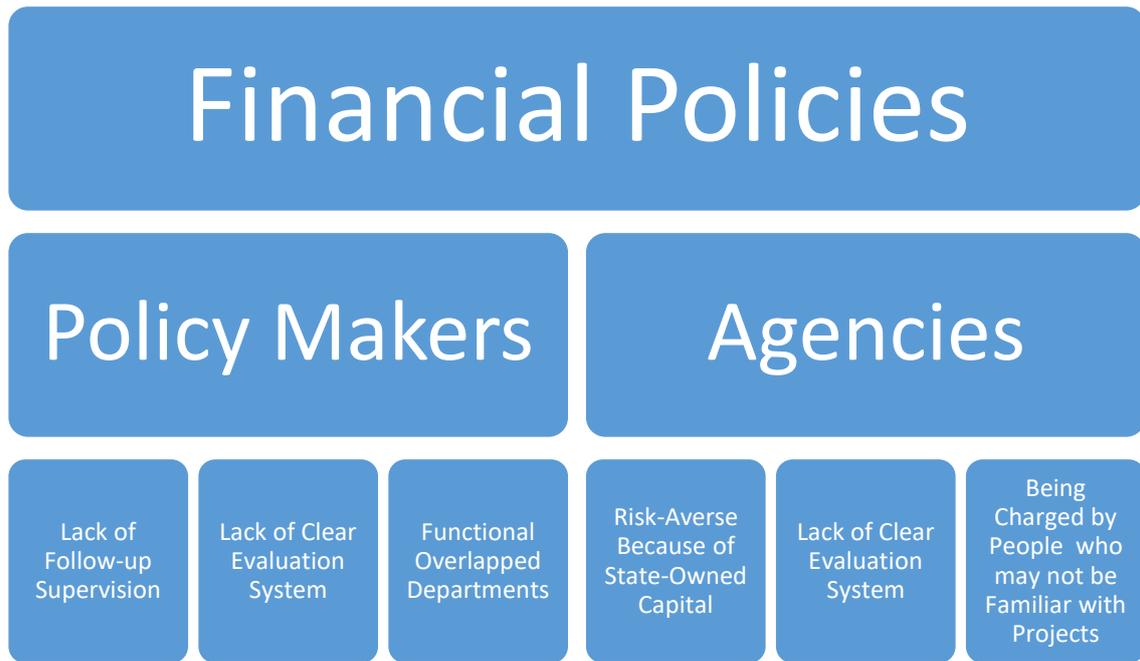
Third, decision makers had no experience or specific knowledge of the area. There were no standard criteria to select firms.

No matter how hard we work to filter good firms, all depends on the boss's decision.

Sometimes, it causes corruption or invests in some bad projects. [Interview: A4]

Figure 6-9 concludes the results from the interviews. It illustrates the problems of financial policies from both policy makers and agencies' views.

Figure 6-9: The Problems of Financial Policies



Source: Author's Fieldwork

6.4.2 Market

As previously discussed, the main reasons that technology-based SMEs had market obstacles were because of the R&D and unfair market competition with politically-connected firms. New firms and matured firms with capital shortage are more willing to rely on external sources, but the majority of ways they acquire these achievements are not regular, which may cause difficulties for other firms. There are some policies targeting at R&D for removing these barriers. The following section will illustrate the policies aimed to remove the unfair market competition.

6.4.2.1 R&D

As illustrated in Figure 6-6, one reason of market obstacles is that technology-based SMEs normally need a long R&D cycle, high inputs and also the market demand changes very fast. This section will introduce external supports for R&D of technology-based firms in China, namely legal supports and financial supports.

Legal Supports

Many interviewees stated that the intellectual property protection in China was not very strong [Interview: S, G1, A3, A4]. But it does not mean the intellectual

property law is lax [Interview: A3, A4]. Actually, A3 and A4 said the legal construction is relatively perfect:

The law has no problem; the problem is execution. There are not many problems in top design. However, when the infringement act happens, the follow-up supports from government are not enough. [Interview: A3]

Because of the government promotion on intellectual property rights, increasing numbers of SMEs have a certain conceptual awareness of this term; they will register intellectual property [Interview: A4]. G1 [Interview] also mentioned that, in recent years, China has invested a lot to improve intellectual property protection. Thus, most firms will try to make a legal declaration. Beebe (2013) also suggested that the intellectual property protection has improved significantly in the past decade, especially with respect to trademark infringement and counterfeiting. But it also has been acknowledged that it has not approached anything near satisfactory levels (Beebe, 2013). From the data of the 2013 Special 301 Report (USTR, 2013), it can be found that there were more than double the reports from rights holders against trademark counterfeiting in China compared with the previous year in 2012. On the other hand, this could represent that there is increasing awareness of the intellectual property rights of the technology-based entrepreneurs.

However, most interviewees still think that the protection is not very strong [Interview: S, G1, A3, A4]. The reason is that the technology achievements from research institutions or individuals cannot be industrialised directly by technology-based firms [Interview: S, G2]. The technology needs to be further developed by firms, which makes the property rights not very clear [Interview: S]. Sometimes the products or services have made use of several technology achievements, which makes it more difficult to clarify the property rights [Interview: S]. From the perspective of S [Interview], many technology achievements are valuable but may not reach the requirements of intellectual property registration criteria. In addition, it takes time to apply patent rights. As a result, many individuals may perceive that the intellectual property protection is not strong enough. On the other hand, it also explains that increasing numbers of technology-based firms are set up every year [Interview: S], because too much of the shady part on the policy makes the entrance barriers lower than they should be.

Financial Supports

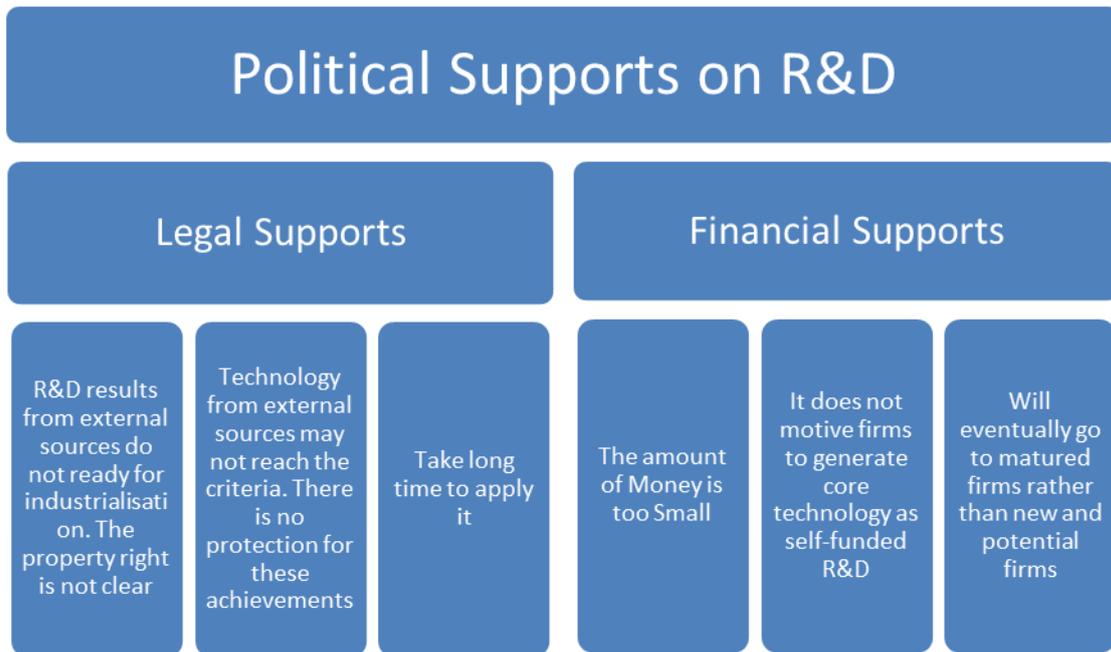
Financial supports have been discussed in the previous section. In this section, only R&D-related financial policies will be discussed, and will show the general perspective of interviewees on the financial supports for R&D development.

Every year, the government spends a huge amount of money to promote technology levels [Interview: G2, G1, Li]. G2 [Interview] said there are increasing numbers of research centres or labs set up by government and also a number of innovative funds are available for technology-based firms. However, the effects are not good enough [Interview: G2, A3].

The most advanced and core technologies normally generate from R&D activities with self-raised funds. Generally, there are no highly advanced technologies from R&D activities with government inputs. Actually, research funds from government sometimes backfire. Doing research with self-raised funds may have more motives to succeed. [Interview: G2]

In addition, A3 [Interview] stated that government inputs in R&D are never enough for the R&D activities of firms. It can only play a helping role; there is no firm that can survive with only government inputs. Moreover, firms need some technology achievements to prove their R&D abilities and, thus, attract government financial supports [Interview: A3]. It means that the firms getting external financial supports may already do R&D activities with self-raised funds. From this perspective, it can be found that government financial supports will ultimately be taken by matured and substantial firms. The needs of many potential firms can be easily neglected. Figure 6-10 shows the problems of political support in R&D. There were both legal support problems and financial support problems.

Figure 6-10: Problems Met When Executing R&D Policies



Source: Author's Fieldwork

6.4.2.2 Information and Markets

As discussed in the limitation section, the second reason causing the market obstacle is the unfair market competition with politically-connected firms. To remove this disadvantage of technology-based SMEs, government has invested in considerable efforts to build science parks, which really do benefit technology-based SMEs as they can be indirectly tied up with government. As E3 [Interview] said, "It should be the most successful choice that government made, and it did work well until now."

The reason that technology-based SMEs with no political connection meet market obstacles is because of getting the same degree of resources, they normally need higher costs than the firms with political connections. But a science park as an intermediary which acts as a bridge between government and firms provides the information, connections and, sometimes, new market trends, and cooperation opportunities with other SMEs and large firms [Interview: A4]. On the other hand it can be seen with politically-connected firms as well. Increasingly technology-based entrepreneurs attempt to start their businesses inside a science park or at least connect with a science park, even they do not geographically locate nearby. Although the policies are aimed at all technology-

based SMEs, technology-based SMEs may receive or experience delay in getting the information.

Government documents have a list of key supports projects that can guide the new trend of national and international markets. Government plays an indirect role here. Specifically, every year there are updated support industry standards in government documents. Entrepreneurs can recognise which areas are more profitable, what products and services more meet the market demand. From this angle, the information, network and market can be put in together.

Because they have less access to information, so they have fewer abilities to decipher the market. In other hand, if they have a strong market position, they can get more information. [Interview: E3].

The science parks play a vital role in spreading the information from government and market.

The regulatory agency in a science park will spread information the first time. [Interview: E3]

Other tools besides science parks include the concessions on procurement to SMEs and concessions on the law of tender and bid to SMEs. However, interviewees said it is of little consequence.

It is useless. Public officials talk about that in every speech, we also work on this. But it is still a plan; no one is bothered to really promote this policy to nationwide. Some local governments probably did, but not nationwide yet. [Interview: G2]

But you should notice that large firms or state-owned firms themselves have many subsidiary enterprises which are SMEs as well. Only when they find their subsidiary enterprises can't do the projects, will they outsource to other SMEs. It will not change because of the policies. [Interview: A4]

It can be found that off-park SMEs cannot enjoy policy benefits, as they have weak market positions and have less access to information. When looking at the policies about market and information, it can only be tied up with science park policies.

Table 6-11 shows the tools, purposes and problems of each information and market support.

Table 6-11: Information and Market Support

Information and Markets	Tools	Purposes	Problem
Science Parks	Geographically gathering technology-based SMEs	Spread useful information; Indirectly connected with Government	-
Concessions on procurement to SMEs	Announcement	Give priority to SMEs when competing with large firms	Hardly benefit small firms eventually
Concessions on the law of tender and bid to SMEs	Announcement	Give priority to SMEs when competing with large firms	Hardly benefit small firms eventually

Source: Author's Fieldwork

6.4.3 Human Capital

Household registration policy is a basic way for the Chinese government to manage population. It also has been used to support SMEs.

For example, if a talent is required by one firm and he is not local, then the firm can ask municipal government for one hukou (registered permanent residence) quota for this employer, as long as this person meets the requirements of "introduction of talents"..... Sometimes, they also provide the registered permanent residence for his/her family members. The government even provides financial supports for the firm because of this person.'[Interview: S]

However, this regulation is more frequently used by less developed cities. Because less developed cities need to attract more promising enterprises, they will provide a variety of supports. Beijing also provides the Hukou quota for high-tech firms, but the assessment criteria are very high if firms apply the quota as an individual firm [Interview: A1]. This will be introduced in the Science Park section later.

The second relative way is SME training and education. Interviewees stated that the training and education is mostly organised by industry associations [Interview: S], or intermediaries like science parks [Interview: A1]. It can be seen as the positive result of financial policies. These industry associations and intermediaries receive financial support from national and local governments, and, thus, they can provide these services for SMEs at low or non-profit.

The third relative way is to hold entrepreneurship contests. These are also not directly held by government, but government acts as one of the sponsors in order to increase the influence [Interview: A1]. The fourth relative way is to hold national job fairs. There are specialised agencies which provide services for SMEs and will help SMEs to find the right talents needed [Interview: E3].

Table 6-12 concludes the results from the interviews and shows the tools and purposes of each human capital support.

Table 6-12: Human Capital Supports

Human Capital	Tools	Purposes
Hukou Quota	Provide Hukou Quota for qualified talents	Induce qualified talents to develop demand industries or cities
Training and Education	Financially support intermediaries and industry associations to provide training and education services at low or non-profit	Improve the human capital of technology-based SMEs
Entrepreneurship Contests	Business plan contests	Discovering potential entrepreneurs, and providing business opportunities
National Job fairs	Specialised agencies provide services for SMEs to find right talents	Improve the human capital of technology-based SMEs

Source: Author's Fieldwork

6.4.4 Internationalisation

There are two main direct policies to support internationalisation, namely export rebates and subsidising and encouraging managers and executives to have trainings or attend trade fairs from abroad.

Government has export rebates for high-tech firms' export. The purpose of this policy is to promote internationalisation. [Interview: S]

Most exports have export rebates, except export-restrained products, including manufacturing, without any technology. [Interview: A2]

Export rebates are the most direct way to support firms going international. Taxes are one of the biggest burdens for business operations, so tax reimbursement can help to decrease costs, thus gaining price advantages and making profits.

However, as discussed in Section 6.3.5 Internationalisation, there are other ways to have connection with international markets, which can improve the potential of technology-based SMEs to expand their international markets.

In order to promote internationalisation, government encourages small firms to attend international trade fairs, but you should have good productions first. Government will subsidise you. [Interview: G1]

Another one is to encourage and subsidise managers and executives in SMEs to have training from some developed countries, for example, Germany. Learn how to trade with other countries, learn foreign culture and so on. [Interview: G1]

Table 6-13 summarises the tools and purposes of internationalisation supports. Export rebates are direct supports that can improve the internationalisation in a straightforward manner. The latter two tools are indirect supports, which can improve the potential of technology-based SMEs to expand their international markets.

Table 6-13: Internationalisation Supports

Internationalisation Supports	Tools	Purposes
Export Rebates	Export rebates for high-tech firms' exports	Promote internationalisation
International trade fair	Encourage and subsidise small firms to attend international trade fair	Improve the reputation and grow international networks
Managers and executives training from abroad	Encourage and subsidise managers and executives to have training from developed countries	Learn foreign regulations and grow international networks

Source: Author's Fieldwork

6.5 Science Park

Establishing science parks is one of the most important methods to support technology-based firms. Government creates a sound district environment for technology-based firms, which is the science park [Interview: S]. To understand science parks, first we should understand the status of the Administrative Committee of Science Parks.

Government sends a number of public officials to the Administrative Committee, like Xi'an Science Park. It's like a sub-organisation from local government. Zhongguancun Science Park Administrative Committee can be seen as the board-level department of government agency. Although an Administrative Committee manages an area, it's not a principle government agency. Government agency in science parks is very simple. There is a Technology Division and Industrial Administrative Office, but of very small scale. The departments only relative to the development of enterprises are established in an Administrative Committee; other departments like the Court or the Procuratorate are not included. [Interview: S]

It can be found that the science parks in China must be authorised by government; no science park is totally market-oriented. As stated by S [Interview], "the establishment of a science park is government behaviour", because "the science parks in China always benefit from support policies". [Interview: S]

Each science park can, to some extent, design their supportive policies for firms inside the park based on national and local policies. They can also apply some unique policies, as long as they are approved by local government, to attract more promising enterprises or potential entrepreneurs [Interview: G2].

Table 6-14 displays the support methods, implementation ways and the purposes of a Science Park. These supportive policies are designed based on national, local and Zhongguancun regional policies. A1 [interview] is the manager of this Science Park.

Table 6-14: Single Science Park Support Methods

Support methods	Implementing ways	Purposes
Tax refund	<ol style="list-style-type: none"> 1) Encourage taxation: firms paying taxes in science parks have opportunities to have tax refund 2) Tax refund for outstanding firms 	Encourage taxation and reduce tax burden
Financial service platform	Cooperate with Banks, VC and PE, to create a financial service platform	Help firms financing, such as small loans, angel funds, to promote the development of firms inside science parks
Information of government policy	Collect and deliver beneficial policies from national and local government	
Information of market supports when applying government support and qualification verification	Collect and deliver advanced information about markets E.g. Affirmation of high-tech enterprises, affirmation of scientific research institutions and accreditation of transformation projects of new and high-tech achievements	
Hukou Quota	Provide Hukou quota for qualified talents	Attract professional talents

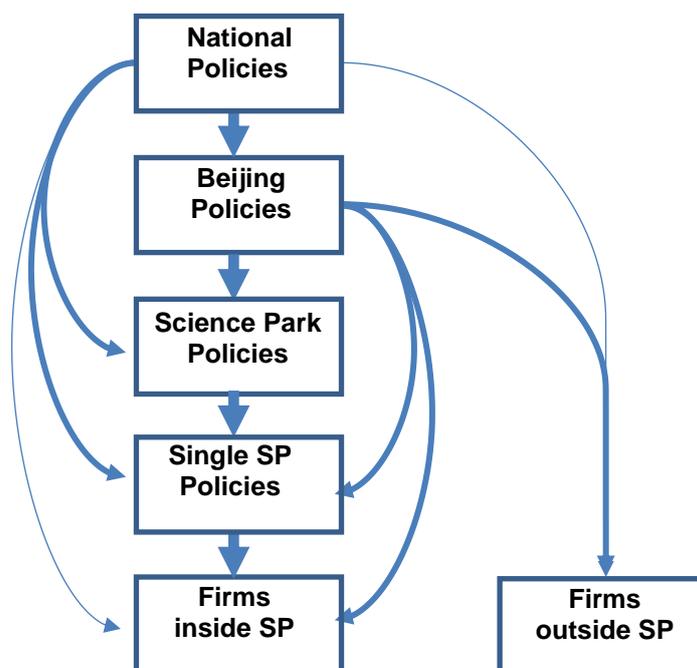
Employees' offspring enrol in school near workplace	Cooperate with primary, secondary and high schools near science parks to allow employees' offspring to enrol	Attract professional talents
Funds	<ol style="list-style-type: none"> 1) Help to apply national and local supportive funds 2) Provide short-term liquid fund for firms with good reputation and potential 	
Innovation forum	<ol style="list-style-type: none"> 1) Education: according to the demand of firms in science parks, provide training every month 2) Training: provide employee training 	Optimise human resources

Source: Author's Fieldwork

It can be found that science parks are more like a policy executor, although they have rights to produce their own policies under the supervision of national and local government. Science parks have a strong direct connection with on-park firms.

According to the results from both document analysis and interviews, Figure 6-11 illustrates the policy implementation process. The thicker the lines are means that there are stronger direct influences. National policies can affect firms directly, but they have weaker direct connection with firms compared with science park policies.

Figure 6-11: From Policy Documents to Policy Implementations



Source: Author's Fieldwork

All of the interviewees from inside of a science park believed that on-park firms perform better than off-park firms. E3 [Interview] said he can get real-time useful policies from the science park and staff in the science parks will help him do the paper work. If the firm does not meet the requirements of policies, the science park will try to guide the firm to improve in some certain ways. Moreover, some specific science park policies, such as rent subsidy, can decrease the operational costs and, thus, improve profits [Interview: E3]. E4 [Interview] also stated that the operating environment inside a science park in terms of the taxation, financial subsidies, qualification accreditation of enterprise and working conditions are much better than those outside of a science park. Accordingly, on-park firms can generally perform better than off-park firms on average [Interview: E4].

From the perspective of A4 [Interview], the on-park firms can enjoy a number of services which off-park firms cannot enjoy. Off-park firms rarely get the information about new policies from government, even policies addressed to all firms in Beijing [Interview: A4]. Another fact that A4 [Interview] pointed out is that when a research team needs to understand the technology-based firms, their first study objects will be on-park firms. As off-park firms, the policy makers know neither their needs nor their existence [Interview: A4]. Thus, he believed that the beneficial policies always tend to support on-park firms.

G2 [Interview] also said that firms inside a science park can enjoy more services, which is very important for the development of technology-based SMEs. A3 thought that on-park firms must perform better than off-park firms [Interview]. First of all, on-park firms can enjoy more beneficial policies than off-park firms. Moreover, in science parks, as many awards and supports are competitive, it may motivate firms to perform better. More specifically, as science park policies are more approachable/visible for firms than the general policies for every firm, on-park firms have more motivations to improve their overall capabilities.

G2 [Interview] thought that the science park was one of the most successful tools to support technology-based firms. She said each science park has its own specific policies and they meet the needs of technology-based firms inside the science park. Tax deduction, subsidies and some other policies inside the science park benefit the technology-based firms considerably. Also, some of the policies cannot be approached by firms outside a science park. Accordingly, firms

inside a science park can perform better than firms outside a science park [Interview: G2].

6.6 Summary

This chapter was a further study on entrepreneurship, technology-based SMEs and policies from interviewees' perceptions. It aimed to answer the research questions associated with the four objectives.

Section 6.2 responded to research question 1(ii), how external and internal influential factors affect entrepreneurial activities. Technological changes, political changes and demographic changes generate entrepreneurial opportunities, which can be seen as the external influential factors. Personal attributes and prior experience allow entrepreneurs to recognise and explore those opportunities, which can be seen as the internal influential factors. The author made an entrepreneurial process framework that combined both Shane's (2003) and Lundström and Stevenson's (2005) models to identify the influential factors of entrepreneurship in Beijing. To sum up, external influential factors generate entrepreneurial opportunities and internal influential factors push individuals to discover and exploit those opportunities and, ultimately, pursue market profits.

Section 6.3 aimed to answer the research question associated with objective two. The market related obstacles, financial limitations, human capital disadvantages, networks and information disadvantages were discussed. It has been highlighted that the lack of an evaluation system for intangible assets is the root of financial shortage; not only new firms, but also old firms meet financial challenges. The objective and subjective reasons of financial limitations were identified. Furthermore, market-related barriers were the most frequently mentioned barriers. The R&D disadvantages due to high costs and high uncertainty were highlighted by the interviewees. Moreover, the unfair market conditions with politically-related firms also generate unnecessary costs when competing for the same resources. Furthermore, information and network barriers were discussed together. It can be found that on-park and off-park firms perceive those barriers differently. Science parks act as a bridge to deliver useful information and help to expand networks. Science parks lower the cost of technology-based firms in collecting useful information. As such, off-park firms might perceive more

information and network barriers. In addition, because of financial shortages, the employment of complex talents is a very efficient way to save costs and promote operational efficiency. However, it was found that different industries perceive human capital barriers in different degrees. Finally, internationalisation barriers were also discussed. There are not many technology-based SMEs in Beijing which have expanded into the international market. Different regulations and laws, technology gaps, lack of capabilities, no long term plan and weak VC are the main barriers for technology-based SMEs entering the international market.

Section 6.4 responded to objective three and the associated research question. The financial policies, market related policies, human capital support policies and internationalisation policies were discussed. Regarding financial policies, there are direct financial policies and indirect financial policies. The former sponsors SMEs directly while the latter funds service intermediaries to encourage them to support SMEs. The drawbacks of the financial support methods were identified. Furthermore, R&D supports and information and market supports were discussed in terms of market-related supports. R&D supports include financial supports and legal supports. The problems when implementing those policies were discussed. In terms of information and market supports, it was highlighted that a science park is the most important tool for lowering the market barriers for SMEs. Other supports, such as concessions on procurement to SMEs and concessions on the law of tender and bid to SMEs, also help to give priority to SMEs when competing with large firms. Finally, human capital supports and internationalisation supports have also been introduced to encourage entrepreneurs to promote international businesses or cultivate more qualified talents.

Section 6.5 responded to objective four. Science parks act as a bridge between firms and government and other service centres. They can, to some extent, design their own supportive policies as long as those policies are approved by local government. But, most importantly, they are also the main policy executors. It has been generally believed that on-park firms perform better than their counterparts, because the operating environment in terms of taxation, financial subsidies, qualification accreditation of enterprise, and working conditions are much better than outside of a science park.

Participants' perceptions have further brought to light certain themes which provide causal understanding of entrepreneurship, innovation, barriers of technology-based SMEs and policy in Beijing. As mentioned in Chapter Four, this study aims to explore the phenomena and expand on current qualitative findings; however, there are some characteristics which, as the current literature supports, are better captured through quantitative means. The more objective nature of quantitative techniques means discovering answers to questions which require the application of scientific procedures to satisfy the research objectives. Therefore, the research will now turn to the next chapter, which will provide the findings and analysis of the questionnaire and, where possible, make reference to the differences and similarities of qualitative findings.

7. Quantitative Analysis

7.1 Introduction

Following the previous chapters on the qualitative results of document analysis and interview data, this chapter will discuss the results from the quantitative research. 150 questionnaires were sent to technology-based SMEs in Beijing, inside and outside of a science park, and 96 valid questionnaires came back. As mentioned in the methodology chapter, quantitative research was designed based on the data collected from qualitative research. The results from the quantitative research will further generalise the results from interviews, and illustrate a straightforward comparison between on-park and off-park firms. Table 7-1 shows the objectives and research questions that will be analysed in this chapter.

Table 7-1: Quantitative Research-Related Objectives and Research Questions

Research Aim			
To examine the effectiveness of government policies on technology-based SMEs and entrepreneurship in Beijing, China			
Objectives	Research Questions	Section	
1) To identify the influential factors of entrepreneurship	ii) How do external and internal influential factors affect entrepreneurial activities?	7.2.1	
2) To identify the characteristics of technology-based SMEs	i) What are the limitations of technology-based SMEs?	7.2.2/7.2.3/ 7.2.4	
	ii) Do state-owned SMEs and privately owned SMEs have different advantages and barriers?	7.3	
3) To examine the effectiveness of policies targeted at technology-based SMEs and entrepreneurship	i) How effective are those policies from entrepreneurs' perspectives?	7.4	
	ii) Do the policies affect the views of entrepreneurs towards the research questions 1(ii) and 2(i)?	7.4.2	
4) To explore the relationship between the performance of technology-based SMEs within and outside government-created science parks	i) What are the differences between on-park and off-park firms?	7.5.2	
	ii) Do the legal forms (state-owned and privately owned) affect the results of research question 4(i)?	7.5.1	

Source: Author's Fieldwork

To recap, participants were selected based on convenience sampling. The researcher approached the firms who were deemed to be technology-based SMEs, and three industries were included in this case, including Service, IT & Software, and Manufacturing. There were 96 respondents in total and Table 7-2 shows the demographic profile of the sample. Firms from the IT & Software industry account for 41.7%, which is the biggest part, followed by manufacturing and the service industry, 40.6% and 17.7%, respectively.

Table 7-2: Characteristics of the Sample

Characteristic	Number (n)	% of respondents
Industry		
Service	17	17.7
IT & Software	40	41.7
Manufacturing	39	40.6
Legal Form		
Independent new private enterprise	68	70.8
State-owned enterprise	18	18.8
MBO	1	1.0
Subsidiary of another firm (in China)	1	1.0
Subsidiary of another firm (from abroad)	6	6.3
De-merger or spin-out from an existing firm (in China)	1	1.0
De-merger or spin-out from an existing firm (from abroad)	1	1.0
Founding Year		
1973-2001	29	31.5
2002-2010	44	47.8
2011-2014	19	20.7
National High-Tech		
No	75	79.8
Yes	19	20.2
Haidian High-Tech		
No	65	69.1
Yes	29	30.9
Located in a Science Park		
No	57	60
Yes	38	40
Received Government support		
No	70	72.9
Yes	26	27.1
Go International		

No	77	80.2
Yes	19	19.8

Source: Author's Fieldwork

There are seven firm types in the questionnaire, which are independent new private enterprise, state-owned enterprise, MBO, subsidiary of another firm (in China), subsidiary of another firm (from abroad), de-merger or spin-out from an existing firm (in China), and de-merger or spin-out from an existing firm (from abroad). It can be found that most firms are independent new enterprises, which account for 70.8%. The second most firms are state-owned firms, which account for 18.8%. Subsidiary of another firm from abroad is in third place (6.3%). As introduced in the section 3.6, policy makers focused on the reform of state-owned SMEs during the last two decades and diversified legal forms have emerged during this period. For example, merger and acquisition (M&A), joint partnership, restructuring and sell-off. Meanwhile, the numbers of state-owned enterprises gradually reduced (Chen, 2006).

Regarding the age of firms, 92 firms responded to this question. The oldest firm from the research was founded in 1973 and the youngest firms founded in 2014. The average age of these firms is 9.25 and the median is 6.5. It can be found that more than half of the researched firms are younger than seven years. Furthermore, firms have been grouped into three categories according to their founding years: 1973-2001, 2002-2010 and 2011-2014. The author took the years 2002 and 2011 as the cutting off points because there were two main political documents released in both years which highly affected the development of SMEs and the technology sectors. As presented in Section 3.5, in 2002 a new law named the SME Promotion Law was released and it pushed a rapid development of the SME sector (Chen, 2006). Furthermore, since 2010 a clearer policy direction has been to promote the support the small to micro-sized enterprises and innovation activities (MOST, 2011b). In addition, throughout China's development history since 1949, there have been changing priorities. Every five years, Chinese policy decides the new focus in what is called a "Five Year Plan" [FYP]. China's 12th Five-Year Plan was approved by the 17th Central Committee of the Communist Party of China in October 2010, and was released in March 2011 (Casey and Koleski, 2011). The biggest concerns of this FYP are environmental protection and the "scientific development concept". It has

provided a huge motivator for the development of technology-based firms. From these groups, I looked at if the policy changes had any influence on the development of technology-based firms.

In China, technology-based firms have to be qualified as a national 'high-tech enterprise' and then they can enjoy policy supports [Interview]. However, science parks, as one of the most important supporting tools, can independently make preferential policies within a policy context, as presented in Chapter 5, Document Analysis. Therefore, applying science park-wide high-tech firms is a good option for start-ups and small firms because they can enjoy the science park's preferential policies. From the statistical results, 20.2% of firms are qualified as national high-tech firms, and 30.9% of firms are Haidian high-tech firms. As introduced in the section 2.3.4, the conditions required by the Administrative Methods for the Confirmation of New and High Technology Enterprises are restricted (MOST, 2008). It requires the firm to own the proprietary intellectual property rights of the core technology used in their products and services, or have an exclusive licence for more than five years. However, for emerging firms, the requirements are difficult to achieve. This is the reason that science parks set their own criteria for emerging firms to apply as science park-wide high-tech firms, which allows emerging firms enjoy to science park supportive policy.

In order to achieve the fourth objective, I grouped the participants into two groups: on-park firms and off-park firms. Sixty per cent of firms are outside of a science park, and 40% inside a science park. Whether there were any differences between entrepreneurs inside and outside of a science park were examined.

In this thesis, the barriers and government support on internationalisation had been studied. There were 19.8% responses, 19 out of 96 firms, doing businesses in the international markets. The barriers, government support and how well the supports were implemented were studied.

This chapter is divided into four key sections and aims to address the research questions associated with the four objectives as shown in Table 7-1. It begins with a statistical analysis of the general information of these participants. The general entrepreneurial environment from the perspectives of entrepreneurs will be studied: a) The entrepreneurs' perceptions on the state of technology-based SMEs, and b) supportive levels from government on starting and developing

businesses will be firstly examined. In addition, the barriers the participants met when a) starting, b) developing their businesses, and c) trying to enter the international market will be illustrated in the following part. Sequentially, start-up and follow-up financing of SMEs will be explored.

The information above will be further compared between a) firms with different legal forms; b) firms receiving government support and not receiving any supports; and c) firms inside and outside of science parks. Specifically, in the second key section, the author will compare the firms with different legal forms. The advantages and disadvantages of firms with different legal forms will be explored. In addition, whether the legal forms of participants affect their perceptions on a) the entrepreneurship environment, and b) the barriers of starting and developing businesses will be examined.

Furthermore, the third key section 7.4 is to examine how the government supports affect firms. Whether receiving government support changes their perceptions on the entrepreneurship environment will be examined. Moreover, the author will also test whether the policies match the needs of technology-based SMEs. In addition, the comparison between firms receiving and not receiving any supports will be examined in this part. The reasons why some people can receive government support and how this support eventually benefits firms will also be studied in this section.

Finally, how the locations affect the participants' perceptions towards the general information will be examined. Specifically, the relationship between location, legal forms and government support will be tested in this section. Furthermore, how the science parks benefit technology-based firms and whether being inside a science park necessarily improves firm performance will be also studied.

7.2 General Information

7.2.1 General Entrepreneurial Environment

Section 6.2.2 explored the external influential factors of entrepreneurial environment, wherein political, social, economic and cultural factors were discussed. There were positive and negative factors influencing the entrepreneurial activities. This section will mainly focus on the political factors in order to understand whether political supports to start and develop businesses

are positively perceived by entrepreneurs. As the literature suggested, section 2.5, the policies can be categorised into two groups, including entrepreneurship policies and SME policies (Shane, 2003).

Three questions are related to the entrepreneurial environment, questions 5, 6 and 9, as shown in Table 7-3. They are on a 5-point Likert scale; the scores are from “very high” or “strongly supportive” coded with number 5, to “very low” or “strongly ignored” coded with number 1. Question 5 is to understand the general state of the SME sector in Beijing, which reflects the general confidence level of the entrepreneurs in the SME sector. This question can be affected by multiple influencing factors, such as social, economic, cultural and political factors (Lee and Peterson, 2000; Reynolds et al., 2002). Question 6 and Question 9 are to understand the entrepreneurs’ perceptions of government support on developing and starting businesses, respectively. Those two questions will only be from the perspective of political factors to explore whether entrepreneurial environment is positively perceived by entrepreneurs.

Table 7-3: Related Survey Questions

	Questions in Survey	Key Words
Q5	How do you perceive the general state of the SME sector in China at the moment?	General State of SME Sector
Q6	How strong do you perceive the government support for SMEs in China to be?	SME Policy
Q9	Do you think the government is generally supportive to entrepreneurs willing to start up their own businesses?	Entrepreneurship Policy

Source: Author’s Fieldwork

Table 7-4: Univariate Results: Entrepreneurial Environment

	N	Mean	Std. Deviation
General State of SME Sector	96	2.625	0.997
SME Policy	96	3.313	1.039
Entrepreneurship Policy	96	3.427	1.013

Source: Author’s Fieldwork

Table 7-4 shows the responses, mean value, the standard deviation. The mean score of the general state of the SME sector is 2.625 (from “low” to “medium”). Responses generally thought that the state of the SME sector is relatively low. However, the participants gave the SME policy and entrepreneurship policy relatively high scores; the mean scores were 3.313 and 3.427 (medium to strong), respectively. It can be interpreted that, although people perceived the supports from government were quite positive, it did not necessarily improve the general state of the SME sector. It showed similar results to the interviews. There were many policies released to improve entrepreneurship, but the overall entrepreneurial environment still suffered from numbers of negative influencing factors (see Table 6-3) and the general perception from entrepreneurs of the state of the SME sector was not very optimistic.

As previously mentioned, entrepreneurship is not only affected by political factors. Thus, it is necessary to test to what degree these three questions correlate with one another. As noted in the methodology chapter, Spearman’s rank correlation coefficient is the main method applied in this thesis. Table 7-5 shows the results of the correlation test. It can be found that there were strong positive relationships between “SME policy supportive level” and “general state of the SME sector” (0.556). The significance value is smaller than 0.01, which indicates the relationship is strongly significant.

Table 7-5: Spearman’s Rank Correlation Test

		State of SME Sector
SME Policy	Correlation	.556**
	Coefficient	
	Sig. (2-tailed)	.000
	N	96

Source: Author’s Fieldwork

The positive relationship between the general state of the SME sector and the SME policy indicates that people who perceived higher levels of developing supports also thought there was a higher state of the SME sector and vice versa. There is no significant relationship between entrepreneurship policy and the state of the SME sector.

The perceptions of entrepreneurs on the state of the SME sector are not only affected by political factors, but also affected by social, economic and cultural

factors. The reason that SME policy has significant relationship with the state of the SME sector rather than entrepreneurship policy is that entrepreneurship policy is more likely to affect the social and cultural factors, which less directly affects entrepreneurs' perceptions of the state of the SME sector. However, it does not indicate that entrepreneurship policy does not affect state of the SME sector, because it tries to build up a more entrepreneurship-friendly economy that can indirectly encourage entrepreneurial activities.

7.2.2 Barriers/Limitations of SMEs and Starting Businesses

This section will illustrate the barriers or limitations of starting technology-based SMEs and developing technology-based SMEs. Question 7 and 8 are to understand the limitations of SMEs and starting SMEs, respectively (see Table 7-6). There were 18 indicators grouped into six categories, including finance, market, networking, human capital, entrepreneur and government-related barriers. The aim of this section is to clarify whether the barriers of starting and operating SMEs are similar or not.

Table 7-6: Related Survey Questions

	Questions in Survey	Key Words
Q7	In your opinion, what are the limitations of SMEs in China?	Limitation of developing SME
Q8	What are the barriers for people to start a business?	Limitations of Starting Businesses

Source: Author's Fieldwork

Table 7-8 shows the ranks of each limitation. All indicators are on a 5-point Likert scale; the scores are from "most significant" coded with number 5, to "least significant" coded with number 1. It ranks from the most significant limitation to the least significant limitation.

All limitations have scores higher than 3, middle to significant barrier. Three indicators received scores higher than 4, most significant barriers, including financial limitation in each stage of SMEs and unfavourable entrepreneurship environment in the infant stage of SMEs. Financial limitation is the highest in both stages of SMEs, but it is slightly higher in infant stage of SMEs (4.323) than established SMEs (4.074). In addition, both Std. Deviation values are quite low. It can be interpreted that, when starting businesses, entrepreneurs might meet more financial constraints than established firms. It shows the same result as has been discussed in the interview chapter; both infant and established SMEs meet

significant financial limitations, but this barrier is more serious for start-up than established firms.

The second most significant limitation is “unfavourable entrepreneurship environment” (4.033). As discussed in Section 6.2.2, there are a few negative external influencing factors of entrepreneurship. However, the qualitative analysis did not show how strong those negative influential factors were compared with positive influential factors. The state of SMEs (low to medium) from the last section and this indicator (significant to very significant) both show that the entrepreneurship environment is not very encouraging.

The author analysed other indicators that have scores between 3 and 4 in groups, as indicated in Table 7-7. The author categorised those indicators into six main classes, including market barriers, networking, R&D, entrepreneurs, government-related and tax burden. The mean scores of each main class will be applied.

More specifically, market barriers include strong market competitions with either large firms or SMEs and high market entry barrier. Furthermore, as discussed in Section 6.3.3, network and information can be seen as the same element. Thus, lack of networks, lack of information and guidance, and lack of access to information and guidance are grouped into networking. Moreover, lack of human capital (management) and lack of human capital (technicians) will be put into the innovation category. Human capital (technicians) is the main contributor of R&D activities. In addition, as emphasised in the section 2.3.5.1, the most important source of organisational innovation is workers in management (Drucker, 1993). Thus, human capital is considered as the main source of the innovation in a firm. Furthermore, lack of experience and lack of abilities to find potential profitable markets are in the entrepreneur category, as both require entrepreneurial skills. Table 7-7 show more details of each main class.

Table 7-7: Description of Each Barrier

Main Class	Barriers/Limitations
Market Barriers	Strong Competition with Large Firms Strong Competition with SMEs High Market Entry Barrier
Networking	Lack of Networks Lack of Information and Guidance Lack of Access to Information and Guidance

Innovation	Lack of Human Capital (Technicians) Lack of Human Capital (Management)
Entrepreneur	Lack of Experience Lack of Abilities to Find Potential Profitable Markets
Government-Related	Monopoly/Oligopoly by Large Firms Complicated Legal Procedures Monopoly/Oligopoly by State-owned Firms Lack of Access to Advice and General Support Lack of Government Support
Tax	Tax Burden

Source: Author's Fieldwork

Table 7-8: Barriers to Starting and Developing SMEs

SMEs	Min	Max	Mean	Std. D	Main Class	Start-up	Min	Max	Mean	Std. D	Main Class
Finance limitation	2.00	5.00	4.074	1.003	Finance	Finance limitation	2.00	5.00	4.323	0.796	Finance
Strong Competition from Large Firms	1.00	5.00	3.916	1.155	Market	Lack of favourable entrepreneurship environment	1.00	5.00	4.033	0.883	Entrepreneurship Environment
Strong Market Competition form SMEs	1.00	5.00	3.862	1.001	Market	High Taxation Burden	1.00	5.00	3.804	1.051	Tax
High Taxation Burden	1.00	5.00	3.809	1.203	Tax	lack of experience	1.00	5.00	3.783	1.025	Entrepreneur
Lack of Networks	1.00	5.00	3.755	0.991	Network	Strong Market Competition	1.00	5.00	3.688	1.161	Market
High Market Barriers	1.00	5.00	3.660	1.103	Market	High Entrance Barriers	1.00	5.00	3.641	1.054	Market
Lack of Technicians	1.00	5.00	3.628	1.037	Innovation	Lack of information and guidance	1.00	5.00	3.620	1.025	Network
Lack of Supports from Government	2.00	5.00	3.600	1.134	Government-related	Monopoly/Oligopoly by Large Firms	1.00	5.00	3.598	1.187	Government-related
Inexperience in Operating a Firm	1.00	5.00	3.574	1.112	Entrepreneur	Complicated Legal Procedures	1.00	5.00	3.467	1.153	Government-related
Lack of Human Capital (Management Skills)	1.00	5.00	3.553	1.113	Innovation	Monopoly/Oligopoly by State-owned Firms	1.00	5.00	3.457	1.304	Government-related
Limited Access to Information	1.00	5.00	3.511	1.013	Network	Lack of Access to Advice and General Support	2.00	5.00	3.441	1.016	Government-related
Limited Abilities to Target Potential Market	1.00	5.00	3.436	1.151	Entrepreneur	Lack of Government Support	1.00	5.00	3.409	1.144	Government-related

Source: Author's Fieldwork

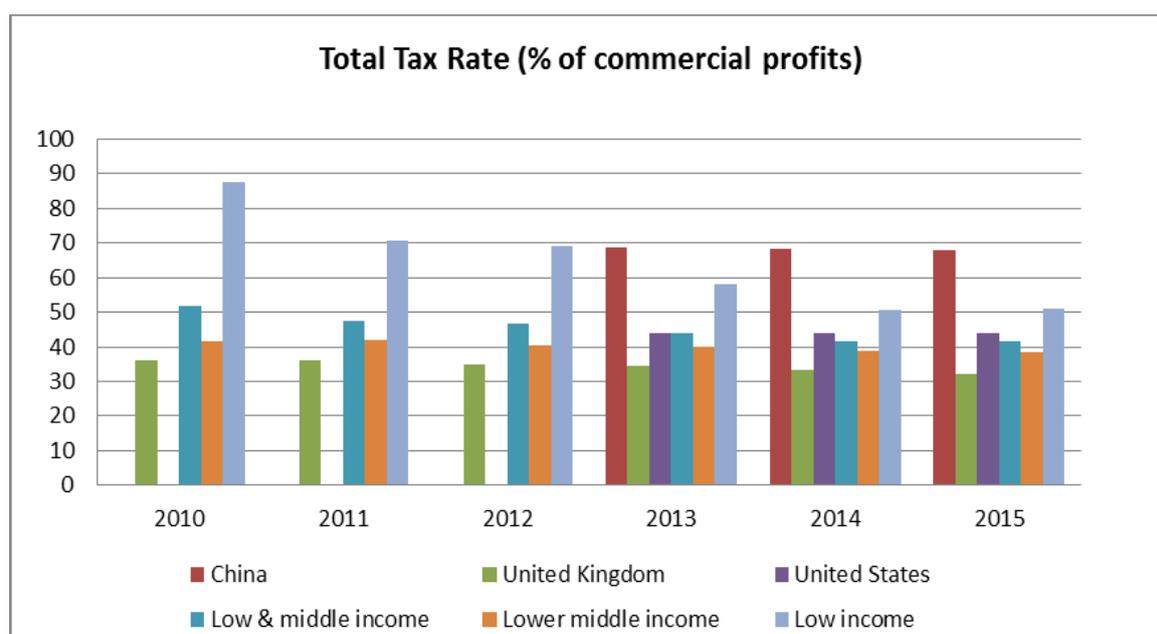
Table 7-9 shows the ranks of barriers in the main classes. Tax burden is the third most significant barrier in both stages of SMEs. Figure 7-1 shows the total tax rate of six districts, including China, the UK, the US, low and middle Income countries, lower middle income countries and low income countries from 2010 to 2015. The data of China is missing until 2013. Before 2013, the total tax rate of low income countries is the highest. But, from 2013, since the data of China is available, it can be found that the total tax rate of China is the highest among those six districts, even compared with low income countries. Thus, from both first hand and second-hand data, it can be found that the tax burden is very significant in China.

Table 7-9: Rank of Barriers in Main Classes

Developing Barriers	Rank (Mean value)	Starting Barriers	Rank (Mean value)
Finance	4.074	Finance	4.323
Market	3.813	Entrepreneurship environment	4.033
Tax	3.809	Tax	3.804
Network	3.633	Entrepreneur	3.783
Government-related	3.6	Market	3.6645
Innovation	3.5905	Network	3.62
Entrepreneur	3.505	Government-related	3.4744

Source: Author's Fieldwork

Figure 7-1: Total Tax Rate (% of commercial profits)



Source: (WorldBank, 2015)

Moreover, entrepreneurs' attributes and government-related barriers are ranked in the last place in the developing and starting stages of SMEs, respectively. It means that, when starting businesses, government-related barriers are the least concerned barriers, while, in the development stage, entrepreneurs' attributes are least concerned. It indicates that government-related barriers attract increasing attention from entrepreneurs when they develop their businesses; ignoring government-related barriers is no longer effective for those firms. It links to the results from Section 6.3.2.1 that the supervision system of government is stronger for matured firms than for firms in the infant stage. Thus, established firms may meet more constraints from government-related barriers. Furthermore, entrepreneurs' attributes are more important for the start-up stage than development stages, because, when firms grow up, they more rely on the market, innovation abilities and network. Entrepreneurs' attributes are not the most important capabilities of a firm. It also shows similar results with Section 6.3 in that firms in the development stage meet huge constraints in terms of market, human capital (innovation) and network.

The Spearman's rank correlation test was applied among those barriers. Table 7-10 shows that many barriers are strongly positively-related. In the development stage, the network barrier has strong positive relationship with innovation barriers (0.414) and entrepreneurial barrier (0.623). The positive relationship indicates that, when lowering the network barriers, the innovation and entrepreneurial barriers will also both be reduced. To support efficiently the development of technology-based SMEs, government can try to remove the networking barriers, which, in the meantime, can also remove the entrepreneurial and innovation barriers. Thus, helping to build up networks, create opportunities for getting access to information and guidance can be an efficient method for government to support the development of technology-based SMEs.

Table 7-10: Spearman's Rank Correlation between Each Barrier

		Market (Develop)	Network (Develop)	Finance (Start-up)	Entrepreneur (Start-up)	Entrepreneurial environment (Start-up)	Network (Start-up)	Market (Start-up)	Government - Related (Start-up)	Tax (Start-up)
Finance (Develop)	Correlation Coefficient	.325**		.346**					.319**	
	Sig. (2-tailed)	.001		.001					.002	
Tax (Develop)	Correlation Coefficient									.452**
	Sig. (2-tailed)									.000
Market (Develop)	Correlation Coefficient			.312**				.445**		
	Sig. (2-tailed)			.002				.000		
Innovation (Develop)	Correlation Coefficient		.412**							
	Sig. (2-tailed)		.000							
Entrepreneur (Develop)	Correlation Coefficient		.623**		.545**	.337**	.385**			
	Sig. (2-tailed)		.000		.000	.001	.000			
Network (Develop)	Correlation Coefficient						.355**			
	Sig. (2-tailed)						.001			
Finance (Start-up)	Correlation Coefficient					.530**				
	Sig. (2-tailed)					.000				

Entrepreneur (Start-up)	Correlation	.384**	.360**
	Coefficient		
	Sig. (2-tailed)	.000	.000
Entrepreneurial environment (Start-up)	Correlation	.330**	.349**
	Coefficient		
	Sig. (2-tailed)	.001	.001
Network (Start-up)	Correlation	.331**	.503**
	Coefficient		
	Sig. (2-tailed)	.001	.000
Market (Start-up)	Correlation		.590**
	Coefficient		
	Sig. (2-tailed)		.000

Source: Author's Fieldwork

In the start-up stage, the government-related barriers have strong positive relationship with network barriers (0.503) and market barriers (0.590). The positive relationships might indicate that discouraging monopoly, simplifying legal procedures, and proving more government support might help, to some extent, to remove network barriers and market barriers. This suggestion needs to be further investigated with richer data. Furthermore, the positive relationship between financial barriers and entrepreneurship environment barriers (0.530) indicate that increasing financial barriers may cause discouraging of the entrepreneurship environment, and/or discouraging entrepreneurship environment may increase financial limitations. Combined with the analysis in Section 6.2.4 that the positive image of entrepreneurship increases the possibilities of external investment, it is very likely that building a more entrepreneurship-friendly environment can, to some extent, decrease the financial barriers.

Finally, the government-related barriers when starting businesses have strong positive relationships with not only start-up barriers, but also developing barriers. However, the government-related barriers in the development stage do not show any relationship with any of the other barriers (see Appendix 9). On the other hand, it approves that entrepreneurship policy is significantly important for the development and establishment of SMEs, which has a strong effect on improving or reducing the quality of SMEs.

In order to understand the relationships between the entrepreneurship environment and the barriers that entrepreneurs perceived, the Spearman's rank correlation test was applied. Table 7-11 shows the results of the correlation test and only values higher than 0.25 are shown.

Table 7-11: Correlation (Entrepreneurship Environment & Barriers)

	State of SME Sector	SME Policy	Entrepreneurship Policy
Market	Correlation Coefficient		.261*
(Develop)	Sig. (2-tailed)		.011
Network	Correlation Coefficient		.265**

(Develop)	Sig. (2-tailed)			.010
Government Related	Correlation Coefficient		-.260*	-.389**
(Develop)	Sig. (2-tailed)		.011	.000
Network	Correlation Coefficient		.436**	
(Start-up)	Sig. (2-tailed)		.000	
Market	Correlation Coefficient	.294**	.325**	.289**
(Start-up)	Sig. (2-tailed)	.004	.001	.005
Government-Related	Correlation Coefficient	.295**	.369**	
(Start-up)	Sig. (2-tailed)	.004	.000	

Source: Author's Fieldwork

It can be found that the government-related barriers in the start-up stage show positive relationship with government SME supports, while government-related barriers in the development stage show negative relationships with government SME supports and government start-up supports. It indicates that entrepreneurs who perceive high government-related barriers in the start-up stage think highly of SME policy. But, for entrepreneurs who perceive high government-related barriers in the development stage hold a negative attitude towards both SME policy and entrepreneurship policy. Apart from government-related barriers in the start-up stage, other barriers all show positive relationship with the policies. Thus, it indicates that removing government-related barriers for established firms may improve their perceptions towards the policy effect. On the other hand, those positive relationships mean that, although the entrepreneurs think highly about the policies, they still feel the constraints that they meet are very high. It implies that the policies failed to produce the desired effects.

7.2.3 SME Finance

This section will investigate the sources of SME financing. As mentioned in the previous section, finance was the biggest barrier for both starting and developing technology-based SMEs. Also, start-up financing seemed to meet more constraints than raising financial capital in the later stage. To gain more detailed information, the sources of start-up financing will first be investigated, then the

relationship between start-up financing sources and the barriers they met will be tested. Finally, the follow-up financing sources will be introduced.

7.2.3.1 Start-up Financing

Table 7-12 shows the rank of the sources of finance for starting a business. It can be seen that almost half of the respondents are self-funded (46.9%), which is the most common way for raising funds. The second most frequent way is getting investment from state-owned firms or government (22.9%), followed by venture capital and angel (15.6%), and bank loan (7.3%). The first two ways account for almost 70% of the total responses, and VC and angel and bank loans account for around 23%. Bank loans are less available than VC and angel; less than half of VC and angel. It can be found that technology-based SMEs still meet significant problems to raise money to start businesses from external sources. It means that high-tech industries are more vulnerable in the capital market, as they hold intangible assets that are hard to value. As mentioned in the literature review chapter (Carpenter and Petersen, 2002), high-tech industries meet more financing constraints and funding gaps.

Table 7-12: Rank: Start-up Financing Sources

Rank		Frequency	Percent
1	Self-raised Funds	45	46.9
2	Invested from state-owned firms or government	22	22.9
3	Venture capital and angel	15	15.6
4	Bank Loan	7	7.3
5	Others	7	7.3
	Total	96	100

Source: Author's Fieldwork

7.2.3.2 Post Start-up Stage Financing

In this section, the post start-up financing will be investigated. The respondents were asked what sources they had access to for additional finance, and to choose between already had, will apply and no idea. There are six financing tools, namely equity financing, venture capital, bank loan, government funds involved, self-raised and initial public offering (IPO). Entrepreneurs can have more than one financing method (see Table 7-13).

Table 7-13: Post-Start-up Financing Methods

Q11. After start-up stage, what sources do you have access to for additional finance? (multiple choice)			
	Already tried this way	Plan to use this way	Don't know yet
Equity financing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Venture capital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bank loans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government capital involved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Self-raised funds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Initial public offering (IPO)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Source: Author's Fieldwork

Eighty-nine participants provided their financing methods. Table 7-14 shows the results of this question. It can be found that bank loans were the most frequently used method to raise additional capital. However, for the future plan, entrepreneurs mostly tended to choose equity financing, VC and IPO. Moreover, only 16.30% of participants had already raised additional finance from multiple methods and 29.40% of participants had a future plan to raise additional capital. More than 50% of participants did not have a clear financial plan. It implies that most entrepreneurs do not have long-term financial plans. In addition, after the start-up stage, only 16% of respondents had pursued additional capital. This may imply that small technology-based firms do not have the need to ask for additional

capital, which can be interpreted in two ways. First, they do not have the need to grow their businesses. Second, they do not want to take the risks from asking for money from external sources.

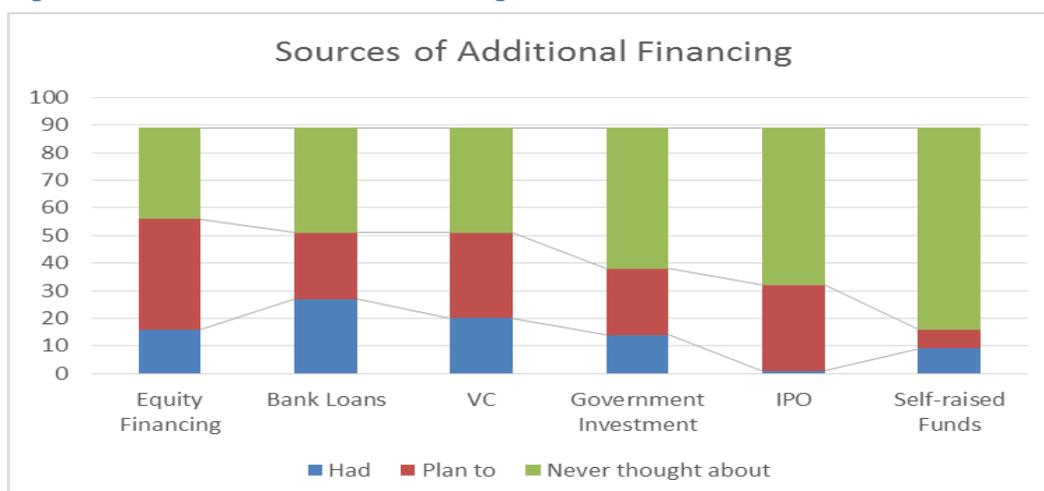
Table 7-14: Follow-Up Financing

	Bank Loans	VC	Government Investment	Self-raised Funds	Equity Financing	IPO	Total	%
Had	27	20	14	9	16	1	87	16.3
Plan to	24	31	24	7	40	31	157	29.4
Never thought about	38	38	51	73	33	57	290	54.3
Total	89	89	89	89	89	89	534	100

Source: Author's Fieldwork

Figure 7-2 provides more detailed information about additional financing. It is sorted by “already had” to “plan to”, from the largest to smallest. It can be found that equity financing is the method that most participants consider as the financing option. Bank loans and VC are the next most frequently used and/or considered financing methods. Interestingly, self-raised financing method is the least considered for raising additional capital. It again implies that those entrepreneurs are willing to take fewer risks when they develop the businesses. If there is a need for additional finance, those entrepreneurs prefer to acquire additional capital from external sources rather than self-raising.

Figure 7-2: Sources of Additional Financing



Source: Author's Fieldwork

7.2.4 Internationalisation

In this section, the barriers for technology-based SMEs entering the international market will be explored. In addition, the government support for internationalisation will be investigated in order to understand whether policies emphasis match the needs of technology-based SMEs. Within all 96 responses, only 20% (19 responses) had already expanded into the international markets, and 80% (77 responses) had not.

Table 7-15 illustrates the ranking of barriers for expanding international markets. It can be found that the entrepreneurial barrier and the innovation barrier were the most concerned barriers for technology-based SMEs; they accounted for three out of the top ten barriers. “Most firms do not have long-range planning”, and “Lower abilities in R&D compared with foreign merchandise” got the highest mean scores of 3.8889 (from Medium to Agree) and 3.877 (from Medium to Agree), respectively. The first ten reasons got a mean score higher than 3.5, which meant those reasons were, relatively, the most important reasons to stop technology-based SMEs going into international markets. Network, culture, financial and ability-related barriers are also significant barriers, but not as significant as entrepreneurial and innovation barriers. As such, the reasons that Chinese technology-based SMEs are less likely to go international are because they are not aware about international market opportunities and, even if they considered internationalisation, they do not have strong innovation capabilities to support the internationalisation.

“Immaturity of financial institution, SMEs cannot get useful resources from them” ranked in fourth place. As the qualitative research suggested, professional VC/Angel can provide multiple supports not only financial capital. The non-financial supports from those financial institutions were more important for firms to expand into international markets. “Shortage of working capital” and “the differences in culture, language, and regulation” were at the fifth and sixth places. There were more barriers mentioned in the questionnaires (see Appendix 9).

Table 7-15: Barriers for Technology-based SMEs to International Markets

	Subclass	Main Class	N	Mean	Std. Deviation	1/3 of the Mean
1	Most Firms Do Not Have Long-Range Planning	Entrepreneur	90	3.8889	1.07520	1.2963
2	Lower Abilities in R&D Compared with Foreign Merchandise	Innovation	90	3.8778	1.22546	1.2926
3	The Merchandise Does Not Cater to the Needs in Foreign Markets	Innovation	90	3.6889	1.17697	1.2296
4	Immaturity of Financial Institution (like Angel and VC), SMEs Cannot Get Useful Resources From Them	Network	90	3.6556	.95000	1.2185
5	Shortage of Working Capital to Finance Exports	Finance	90	3.6444	.99788	1.2148
6	The Differences in Culture, Language and Legal Regulations	Culture	90	3.6333	1.14607	1.2111
7	R&D is Mainly from Learning and Absorbing Foreign Technology	Innovation	90	3.6000	1.24341	1.2000
8	Lack of Abilities to Identify Foreign Business Opportunities	Entrepreneur	90	3.5889	1.24426	1.1963
9	Exhausting to Survive in Home Market	Abilities	90	3.5222	1.25625	1.1741
10	Believe it is Harder to Explore the International Markets Than Survive in Home Market Only	Entrepreneur	90	3.5000	1.05202	1.1667

Source: Author's Fieldwork

For the participants who had expanded their international markets, they were asked to select what government support they received for internationalisation. Table 7-16 shows the results of the question. It can be found that the most common government support is “export rebates” (24.39%). And “provide opportunities about international communication and cooperation” was the second most popular way to support internationalisation. Table 7-16 also shows the main class of supports. It can be seen that financial and networking supports were the most frequently used tool from government. The technology and

entrepreneurial barriers had not been removed or lessened by government policies. The policy emphasis was focusing on financial supports.

Table 7-16: Support from Government

Support From Government			
Rank	Supports	Main Class	Percent
1	Export Rebates	Finance	24.39%
2	Provide Opportunities About International Communication and Cooperation	Network/entrepreneur	21.95%
3	Advanced Information From Government	Network	12.20%
3	Encourage and Help Attend International Trade Shows	Network	12.20%
5	Get A Special Fund From Government	Finance/Innovation	9.76%
5	Nothing	/	9.76%
7	Chinese Government Cooperates with Foreign Governments to Help Train the Outstanding Managers in High-tech SMEs	Innovation/Entrepreneur	7.32%
8	Provide Opportunities for Managers in Firms to Developed Countries to Have a Trade Study	Culture/Network	2.44%

Source: Author's Fieldwork

The previous two tables show the ranking of barriers, frequently used government support and the competitive advantages of internationalised firms, respectively. The author categorised each indicator to main classes, including innovation, finance, culture, entrepreneur and network, as shown in Table 7-17. The policies should be designed to remove/lessen the barriers.

Table 7-17: Descriptions of Each Main Class

Main Class	Description
Network	Connections with other companies, government, or other sources who can provide useful information
Culture	To have information or knowledge about foreign markets
Innovation	Technology/ R&D abilities
Finance	Financial capital
Entrepreneur	Personal abilities

Source: Author's Fieldwork

Table 7-18: Ranks of Main Barriers and Main Government Supports

Rank	Barriers	Supports
1	Entrepreneur	Finance
2	Innovation	Network
3	Network	Entrepreneur
4	Finance	Innovation
5	Culture	Culture

Source: Author's Fieldwork

Table 7-18 exhibited the ranks of internationalisation barriers and frequently used internationalisation supports. It can be found that the focus of government support is financial supports, which is the least concerned barrier but one on the list. From the entrepreneurs' perspective, entrepreneurial and innovation barriers should be paid more attention by policy makers.

7.3 Legal Form

Qualitative chapter highlighted the challenge of technology-based SMEs that unfair market competition with politically-connected firms. This section will use the quantitative data to investigate whether the privately owned firms and state-owned firms have different advantages. In order to display a straightforward discussion, except independent new private enterprise and state-owned enterprise, all other legal forms will put into one category (Others), as shown in Table 7-19.

Table 7-19: Legal Form of Survey Responses

Legal Form	N	%
Independent new private enterprise	68	70.8
State-owned enterprise	18	18.8
Others	10	10.4

Source: Author's Fieldwork

Firstly, the advantages of technology-based SMEs will be presented in the following section regarding their legal forms to investigate if there are any

differences due to their legal forms. Then the author will further investigate the differences between state-owned and privately owned firms.

7.3.1 Advantages Regarding Legal Forms

Eleven advantages were in the questionnaire and they are categorised into eight types of advantages for serving the aim, namely finance, market, network, human capital, internationalisation, culture, government support and R&D advantages. It was a multiple option question and the respondents were asked to tick the advantages they perceived. For the response that ticked several answers in the same category it will be counted as one advantage. For example, when the respondent perceived their advantages were “enjoy an existing network” and “better access to information”, they will be counted as one network advantage. The main class and the subclass used in questionnaire are show in Table 7-20. The purpose of this section is to understand what advantages they perceive are the most significant.

Table 7-20: Advantages

	Advantages
Finance	Sufficient Financial Capital
Market	Strong Market Power
Network	Enjoy An Existing Network Better Access to Information
Human Capital	Abundant Human Resources
Internationalisation	Better Access to International Market
Culture	Familiarity to Local Culture
Government Support	Government Support
R&D	Achieved R&D facility or Technology Less R&D Costs Better Capability in Conducting Independent R&D

Source: Author’s Fieldwork

As this question was in regard to their legal form, I will take the legal forms into consideration. As Table 7-19 shows, there are privately owned firms, state-owned firms and other types of firms. This section is to understand the differences

between state-owned and privately owned firms, thus, only those two types of firms will be used in the analysis. To know more about which types of firms perceive more advantages, a Mann-Whitney U Test was applied. The result is shown in Table 7-21.

Table 7-21: Mean Rank Deference between Independent and State-owned Enterprises (Advantages)

	Test Statistics ^a			
	internationalisation	Culture	Government Support	R&D
Mann-Whitney U	342	412	398	370
Z	-4.619	-2.641	-2.924	-2.973
Asymp. Sig. (2-tailed)	0	0.008	0.003	0.003

a. Grouping Variable: Legal form

	Legal form	Ranks		
		N	Mean Rank	Sum of Ranks
Internationalisation	Independent	68	39.53	2688
	State-owned	18	58.5	1053
Culture	Independent	68	46.44	3158
	State-owned	18	32.39	583
Government Support	Independent	68	40.35	2744
	State-owned	18	55.39	997
R&D	Independent	68	47.06	3200
	State-owned	18	30.06	541

Source: Author's Fieldwork

The group with higher mean rank indicates that it perceives higher level of advantages. Table 7-20 identified the meanings of each advantage. Internationalisation indicates that the people perceive advantages when they enter international markets. Culture means that people have advantages because they are familiar with local culture. Government supports indicate that people think it is easier to be supported by government. And R&D means the people perceive higher advantages when they do R&D. According to the result showed on Table 7-21, the independent enterprises are more likely to have advantages in culture and R&D, which means they are more familiar with local culture and better at conducting R&D. On the contrary, state-owned enterprises

are more likely to perceive advantages in internationalisation and government supports, which indicates they are more likely to getting supports from government and entering international markets than private enterprises.

7.3.2 The Differences Between State-owned and Privately Owned Firms

This section examines whether firms' legal forms have any influence on their perceptions of the general entrepreneurship environment and the perceived barriers for starting and developing businesses, as discussed in Section 7.2.1 and 7.2.2.

The state-owned firms are also considered as government-owned firms (Dewenter and Malatesta, 2001), which means that they are supposed to have stronger interventions from government.

Mann-Whitney U test was applied to examine whether firms with different legal forms have different perceptions on the entrepreneurship environment. It can be found that independent enterprises were more likely to think highly about the state of SME sector than the state-owned firms. However, independent enterprises thought that the government supports for starting business are lower than what were perceived by state-owned firms, see Table 7-22.

Table 7-22: Mean Rank Deference between Independent and State-owned Enterprises (Entrepreneurship Environment)

		Test Statistics ^a			
		State of SME Sector	Government Start-up Support		
Mann-Whitney U		361	421.5		
Z		-2.826	-2.115		
Asymp. Sig. (2-tailed)		0.005	0.034		
a. Grouping Variable: Legal form					
		Ranks			
	Legal form	N	Mean Rank	Sum of Ranks	
State of SME Sector	Independent	68	47.19	3209	
	State-owned	18	29.56	532	
Government Start-up Support	Independent	68	40.7	2767.5	
	State-owned	18	54.08	973.5	

Source: Author's Fieldwork

In order to understand the relationships between legal forms and the barriers technology-based SMEs meet, an independent t-test was applied. Table 7-23 exhibited the results.

Table 7-23: Independent T-test between Independent and State-owned Enterprises (Barriers)

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Financial Barrier (Development)	Equal variances assumed	0.687	0.409	2.682	84	0.009	0.54493	0.20318	0.14089	0.94898
	Equal variances not assumed			2.691	26.827	0.012	0.54493	0.20254	0.12924	0.96063
Entrepreneurial Barrier (Development)	Equal variances assumed	0.187	0.667	-2.722	84	0.008	-0.57546	0.2114	-0.99585	-0.15506
	Equal variances not assumed			-2.782	27.483	0.01	-0.57546	0.20697	-0.99979	-0.15113
Group Statistics										
	Legal form	N	Mean	Std. Deviation	Std. Error Mean					
Financial Barrier (Development)	Independent new private enterprise	68	4.1838	0.76736	0.09306					
	State-owned enterprise	18	3.6389	0.76323	0.17989					
Entrepreneurial Barrier (Development)	Independent new private enterprise	68	3.3868	0.8032	0.0974					
	State-owned enterprise	18	3.9622	0.77481	0.18262					

Source: Author's Fieldwork

The significance of Levene's Test for Equality of Variances is greater than 0.05, which means that the variability in the two conditions is about the same. Thus, the scores in one condition do not vary too much more than the scores in another condition. The first row will be of t-test for equality of means will be applied. As

the significant value is 0.009 and 0.008 for financial barriers and entrepreneurial barriers, respectively, there are significant statistically significant differences between the mean number of those two barriers for the independent and state-owned firms. The low significance value indicates that the apparent difference does not happen by chance. According to the mean values, the independent firms perceive higher level of financial barriers than state-owned firms. And the independent firms meet lower level of entrepreneurial barriers than state-owned firms.

It showed a similar result to the qualitative analysis. In Section 6.3.1, the state-owned firms can get easier access to external investment, especially government investment or state-owned firm investment, while, for privately owned firms, they were more likely to start the businesses with self-raised funds. Even for the follow-up financing stage, only the state-owned firms had additional capital from bank loans, which, to some degree, assures that privately owned firms meet more limitations when they raise capital. Furthermore, in Section 6.2.3, the entrepreneurs from privately owned firms showed a variety of entrepreneurial characteristics. It did not mean that entrepreneurs from state-owned firms were a lack of entrepreneurial abilities just that they might not show as strongly as entrepreneurs from privately owned firms.

7.4 Government Support

Within 96 responses, there were 26 respondents who had received some supports from government, which accounted for 27%; while 73% of respondents never received any supports from government. It remains two questions, what firms can be selected as the supporting target, and how do the government support benefit technology-based firms will be studied in this section.

This section will illustrate the influences of government interventions on technology-based SMEs. The first part will indicate what policies the entrepreneurs think are conducive to the development of technology-based SME.

Furthermore, the reasons why firms are or are not chosen to be supported by government will be illustrated.

7.4.1 Government Support

This section examines whether the support that technology-based SMEs need and the support frequently used by government match with each other. To do so, the ranks of important supports from government and the ranks of the most frequently received supports will be illustrated in this section. Table 7-24 and Table 7-25 show the ranks of each government support and ranks of the frequencies of each government support received by respondents, respectively.

From Table 7-24, it can be seen that four supporting methods scored higher than 4 (from important to very important), including tax relief and different ways of direct financial supports. Tax relief ranked in first place among all supporting methods. Frequently used methods also ranked tax relief in first place (see Table 7-25). Those government supports can be grouped into six categories, including tax relief, direct financial supports, indirect financial supports, network, human capital and internationalisation.

Table 7-24: The Ranks of Important Supports from Government

Q24 The rank of important supports from government						
	Subclass	Main Class	N	Mean	Std. Deviation	1/3 of the Mean
1	Tax Relief	Tax Relief	96	4.79166	0.52147	1.597222
2	Financial Supports (Providing Free Government Investment)	Direct Financial Supports	96	4.36458	0.96376	1.454861
			3			
3	Financial Supports (Research Funds Provided by Government)	Direct Financial Supports	95	4.1789	0.99978	1.392967
4	Financial Supports (Discounted Interests on Bank Loans)	Direct Financial Supports	96	4.04166	1.02512	1.347222
			7			

5	Support of Internationalisation	Internationalisation	96	3.95833	1.07524	1.319444
6	Advanced Information that Benefits Development of Firms	Network	96	3.8438	1.09739	1.281267
7	Advice and Guidance from Government	Network	95	3.80208	1.09739	1.267361
8	Training and Education Opportunities	Human Capital	96	3.79166	1.0148	1.263889
9	Free or Low Cost Infrastructure	Indirect Financial Supports	95	3.71875	1.08827	1.239583
10	Housing Subsidies	Indirect Financial Supports	95	3.63541	1.02292	1.211806
11	External Expertise	Human Capital	95	3.57291	1.1623	1.190972
12	Indirect Financial Supports (from Venture Capital that Received Governmental Guiding Funds)	Indirect Financial Supports	95	3.46875	0.97643	1.15625

Source: Author's Fieldwork

Table 7-25: The Supports Most Frequently Received

Q25 The supports most frequently received			
	Subclass	Main Class	Percentage
1	Tax Relief	Tax Relief	28.99%
2	External Expertise	Human Capital	13.04%
3	Training and Education Opportunities	Human Capital	11.59%
4	Financial Supports (Providing Free Government Investment)	Direct Financial Supports	8.70%
5	Financial Supports (Discounted Interests on Bank Loans)	Direct Financial Supports	8.70%
6	Financial Supports (Research Funds Provided by Government)	Direct Financial Supports	8.70%
7	Indirect Financial Supports (from Venture Capital that Received Governmental Guiding Funds)	Indirect Financial Supports	7.25%
8	Housing Subsidies	Indirect Financial Supports	4.35%

9	Advanced Information that Benefits Development of Firms	Network	2.90%
10	Free or Low Cost Infrastructure	Indirect Financial Supports	2.90%
11	Advice and Guidance from Government	Network	1.45%
12	Support of Internationalisation	Internationalisation	1.45%

Source: Author's Fieldwork

Table 7-26 illustrates the comparison between important supports and frequent supports. In both columns, tax relief was in first place, which indicated that what firms thought was important for their development was tax relief, while, on the other hand, government support made good use of this tool to support the development of technology-based SMEs. Apart from tax relief, no other supporting method stayed in the same ranks between the two columns. But there was no obvious difference between the two columns. Direct financial supports were the third most considered supporting tools by government and, from the entrepreneurs' side, it was the second important support that they need for development. Network Supports were similar to direct financial supports; it needs more attention from government when they implement policies because it ranked in a lower position in terms of frequent supports than important supports in entrepreneurs' thinking. The support on internationalisation was relatively important for technology-based SMEs, as it ranked in third place. However, it was the least frequently received support. On the one hand, it indicates that entrepreneurs are paying abundant attention to internationalisation, no matter firms who had already expanded into international markets or were staying in only local markets. On the other hand, it cannot imply that government did not provide enough support on internationalisation, because too few participants expanded their international markets (20%); there was little opportunity to show that internationalisation can be a frequently received support.

Interestingly, human capital was the second most frequently used supporting method from government, but was less considered by entrepreneurs. Human capital, as shown Table 7-24 and Table 7-25, included external expertise and

training and education opportunities. The reason that it was the second frequently used method might be that it needs less financial investment than other methods and, potentially, can have wide coverage. However, it seems that entrepreneurs did not take this as the most important support they need.

Indirect financial supports were the fourth most frequently used methods, but ranked in last place in what entrepreneurs need. It can be interpreted in two possible ways. On the one hand, as it is an indirect support, it might not give a direct sense of supporting. In this sense, government should find a way to expand the effect of indirect financial supports. On the other hand, the supports might not be strong enough. Housing subsidies and free or low cost infrastructure do not orient to all technology-based SMEs. Thus, entrepreneurs do not realise the importance of indirect supports.

Table 7-26: Comparison between “Important Support” and “Frequent Support”

Rank	Important Supports	Frequent Supports
1	Tax Relief	Tax Relief
2	Direct Financial Supports	Human Capital
3	Internationalisation	Direct Financial Supports
4	Network/Information	Indirect Financial Supports
5	Human Capital	Network/Information
6	Indirect Financial Supports	Internationalisation

Source: Author’s Fieldwork

Table 7-27 illustrates the benefits they got after they received government support. Three benefits had more than 15% responses and they altogether accounted for more than 60% in total; they are, increase in operational revenue (22.35%), increase in R&D expenditure (20%) and higher level of brand recognition (18.82). Specifically, tax relief was the most frequently used method as government support to increase the operational revenue, which was a straightforward benefit. However, it cannot be achieved without benefits brought

from other types of government supports. Human capital, direct financial supports and other supports make entrepreneurs aware of the importance of technology, which increases the R&D expenditure. Moreover, financial support, as presented in the previous chapter, scored highly in supporting the development of firms' R&D level, which may also increase R&D expenditure. Higher level of brand recognition was mentioned by the interviewees but was not presented in the previous chapter. It will be presented here to support this point:

The government funds normally work as priming. You can get reputation when you get the money, which will help your follow-up procedure. [Interview: E3].

As targeted firms were screened by certain criteria, it can be a covert act of promoting brand that eventually benefits future development. Other benefits can be found in Table 7-27, but they are not as important as the previous three. Thus, they will not be presented in detail here.

Table 7-27: Benefits from Government Support

Q26 Benefits from government support		
1	Increase in Operational Revenue	22.35%
2	Increase in R&D Expenditure	20.00%
3	Higher Level of Brand Recognition	18.82%
4	Increase in Employment	10.59%
5	Increase in Market Share	9.41%
6	Increase in Business Network	9.41%
7	Increase in Working Capital	5.88%
8	Competitive Advantages in Market Power against Firms of a Similar Size	2.35%
9	Competitive Advantages in Market Power against Large Firms and State-Owned Firms	1.18%

Source: Author's Fieldwork

7.4.2 The Differences between Firms That Did and Did Not Receive Government Support

This section is to understand whether receiving government support changed the perceptions of entrepreneurs in terms of the general entrepreneurship environment and the barriers they meet. The rank correlation test is applied to test whether there are any significant relationships between those elements. Table 7-28 shows the results of the correlation test. The table highlights the significant relationship between “received government support or not” and other general information of firms, including “years”, “qualified as high-tech or not”, “located inside a science park or not”, “general perception of the state of the SME sector” and “general perception of the government SME supports”. The highest correlation value is 0.349 with “general perception of the government SME supports”. Two indicators have a correlation value higher than 0.300, including national high-tech, government SME supports and start-up market barriers.

Table 7-28: Rank Correlation

		Year	National High-Tech	State of SME Sector	SME Policy
Received	Correlation	.287**	.340**	.262**	.349**
Supports	Coefficient				
	Sig. (2-tailed)	.005	.001	.010	.000

Source: Author’s Fieldwork

There is significant positive relationship between “received government support” and “qualified as national high-tech firms” (0.340). The concern is that the correlation test has no independent variable, and it does not imply causation. However, from the qualitative results, it has been emphasised by interviewees that only when a firm qualified as national high-tech firms could they enjoy government support. Thus, the positive relationship indicates that national qualified high-tech SMEs are more likely to receive government support.

There also exist positive relationships between “received government support” and “government SME supports” (0.349), and “received government support” and “The perceptions on SME policies” (0.262). A Mann-Whitney test was applied to understand more about the relationships, and Table 7-29 indicates the results. The P value is smaller than 0.05, which indicates that the difference did not happen by chance. Thus, comparing the mean rank, it can be found that the firms who received government supports are more likely to have positive perceptions on the state of SME sector and SME policies.

Table 7-29: Mean Rank between Firms Received and not Received Supports (Entrepreneurship Environment)

Ranks				
	Received Supports	N	Mean Rank	Sum of Ranks
State of SME Sector	no	70	44.29	3100
	yes	26	59.85	1556
Government SME Support	no	70	42.84	2998.5
	yes	26	63.75	1657.5
Test Statistics^a				
	State of SME Sector		Government SME Support	
Mann-Whitney U	615		513.5	
Z	-2.553		-3.405	
Asymp. Sig. (2-tailed)	0.011		0.001	
a. Grouping Variable: Received Supports				

Source: Author’s Fieldwork

In order to know how the relationship is between “year established” and “received supports or not”, an independent t-test is applied; the result is shown on Table 7-30. The significance of Levene’s Test for Equality of Variances is greater than 0.05, which means that the variability in the two conditions is about the same. Thus, the scores in one condition do not vary too much more than the scores in another condition. The first row will be of t-test for equality of means will be applied. As the significant value is 0.002 for the year established, there is significant statistically significant difference between the mean number of the year for firms what received and not received supports. The low significance

value indicates that the apparent difference does not happen by chance. According to the mean values, the firms who received government supports are more likely to be older than the firms that did not receive any supports.

Table 7-30: Independent T-test between Firms did or did not Receive Supports (Year)

Independent Samples Test										
		Levene's Test for Equality of Variances			t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Differen ce	95% Confidence Interval of the Difference	
								Lower	Upper	
Year	Equal variances assumed	4.63	0.034	3.11	90	0.002	5.06643	1.62531	1.83748	8.29539
	Equal variances not assumed			2.56	32.966	0.015	5.06643	1.9771	1.04383	9.08904
Group Statistics										
Receive Supports		N	Mean	Std. Deviation	Std. Error Mean					
Year	no	66	2006.1818	5.85966	0.72127					
	yes	26	2001.1154	9.38649	1.84084					

Source: Author's Fieldwork

To understand how the relationship was between “government supports” and “barriers perceived by entrepreneurs”, the Spearman’s rank correlation test between received supports and each barrier was applied. But, disappointingly, there was no significant relationship between all participants; most of the significance value was under 0.300. Thus, the author considered the year that firms were founded. The author only examined the group of enterprises older than 7 years, 8 years and 10 years, and detected whether there existed any relationship between “receiving government supports” and “the barriers they perceived”. It is found that the firms older than 7 years, there exist significant positive relationships between “receiving government supports” and “financial

barriers in the development stage”, “market barriers in developing and start-up stages” and “government-related barriers in the start-up stage”, as shown in Table 7-31. With the result from Table 7-30 we can find that firms received government supports are more likely to be old firms. And the results from Table 7-31 implied that within older firms there are strong positive relationships between “how strong they perceived about barriers” and “received supports”.

Section 6.3.1 mentioned that government support normally involves government capital or other resources; thus, there is a high chance to be monitored by government. In addition, many entrepreneurs in Beijing already have a capital base and do not need additional supports. Therefore, when firms do not perceive strong barriers, especially financial and market barriers, they are not willing to have government resources involved in their businesses. It should be noted that those positive relationships are only significant among firms older than seven years. Thus, the adverse selection is more likely to happen among mature firms.

Table 7-31: Rank Correlation between Government Support and Barriers Perceived by Entrepreneurs

	Before 2008	Before 2007	Before 2005
	Receive Supports	Receive Supports	Receive Supports
Financial Barriers	.363*	.415**	.437**
(Developing)	.013	.006	.006
	46	42	38
Market Barriers	.302*	.363*	.324*
(Developing)	.041	.018	.047
	46	42	38
Market Barriers	.512**	.497**	.493**
(Start-up)	.000	.001	.002
	46	42	38
Government-	.382**	.334*	.362*
related Barriers	.009	.030	.026
(Start-up)	46	42	38

Source: Author's Fieldwork

Table 7-32 and Table 7-33 present the reasons of being supported or not supported from respondents' perspectives. It can be found that almost half of the respondents believed that the reason that they got supports was they have potential to grow their businesses. The second frequently mentioned reason was that they believed their firms were exemplary enterprises (26.19%). An exemplary enterprise is selected by an individual science park to represent the advantages of the science park. From this perspective, the exemplary enterprise has a close relationship with the science park. Other reasons, such as advanced information and guanxi with government were less concerned by the participants; all four reasons together accounted for less than 30%.

Table 7-32: Reasons of Being Supported

Q28 Reasons to be chosen	
1	I Have Potential to Grow My Business 47.62%
2	My Firm is an Exemplary Enterprise 26.19%
3	Not Many Firms Know the Information 9.52%
3	I Have Close Relationship with Government 9.52%
4	I Had Priority From Government 7.14%
5	I Got Advanced Information From Government 0.00%

Source: Author's Fieldwork

From Table 7-33 it can be found that more than one-quarter of the respondents believed that the reason that they did not receive any support was that they did not apply. The second most frequently mentioned reasons were "government did not recognise their potential" and "did not have relevant information about the government support". All these three reasons accounted for more than 70%, which should be seen as the main reasons of no supports. Only about 15% thought they were not good enough to get the supports. From Table 7-32 and Table 7-33 we can say the two opposing sides gave totally opposite reasons. People who got supports believed they were qualified to get supports, while

people who did not receive any supports thought they were neglected or just simply did not apply.

Table 7-33: Reasons for Not Being Supported

Q29 Not supported reasons		
1	I Didn't Apply	25.47%
2	I Don't Know the Information	22.64%
2	They Didn't Recognise My Potential to Grow My Business	22.64%
3	I'm not an Exemplary Enterprise	15.09%
4	They Have Closer Relationship With Government	9.43%
5	They Got Priority	4.72%

Source: Author's Fieldwork

Table 7-34 shows that about 68% of the respondents felt there would be some differences when running technology-based SMEs if they could receive government support. And 32% thought there was no difference, with or without supports.

Table 7-34: Perceived Differences or Not Between Did and Did Not Receive Government Supports

Perceived differences	N	%
Yes	65	68
No	31	32

Source: Author's Fieldwork

Table 7-35 shows the reasons why they perceive any differences. More than 30% thought that, with government support, they could gain more brand recognition. Another frequently mentioned reason was that they believed that, with government support, they could lower lessen the operational costs. Other reasons, such as advanced information and markets, were less concerned.

Table 7-35: Perceived Differences with Government Supports

Have Differences	
Low Brand Recognition	30.36%
More Operational Costs	26.79%
No Access to Useful Information	17.86%

Lower Market Share	14.29%
Unfair Market Condition	10.71%
Total	100%

Source: Author's Fieldwork

Table 7-36 shows the reasons why there were no differences in operating businesses. The most concerned reason was “market power is the main competition”, which accounted for more than 35%. Another important reason was they believed that they were in a fair market.

Table 7-36: Did Not Perceive Differences with Government Supports

No Differences	
Market Power is the Main Competition	35.85%
Market Condition is Fair	28.30%
Can Develop More Flexibly	18.87%
The Firm Already has a Strong Market Reputation	16.98%
Can Get Equal Information Through Agency	0.00%
Total	100%

Source: Author's Fieldwork

In summary, there were a few benefits brought from government support, such as increase in operational revenue, increase in R&D expenditure and higher level of brand recognition. Most people agreed that firms with and without government support were different in terms of doing businesses. The most important reason was that getting support can promote their brand, which was a similar point to the benefit brought from government support mentioned previously. There were still some people who believed that with and without government support did not affect their operation, because the market condition was fair and the main competition was always their abilities and market power.

7.5 Location

As mentioned in the previous chapter, the science park is one of the most important tools for governmental supports. On-park and off-park firms might

receive different degrees of government support. In this section, the comparison between on-park and off-park firms will be studied.

7.5.1 Location, Legal Form and Government support

As observed in the qualitative analysis chapters, the science park is a very efficient tool for supporting technology-based SMEs. This section will use quantitative method to test whether the location selections are affected by other influential factors. In addition, whether locations of technology-based SMEs have any significant influences on their development will be tested.

Firstly, a T-test between government support and location, and legal form and location has been used, as shown as Table 7-37. As in Section 7.3, the author only tested the differences between state-owned firms and privately owned firms in terms of location selections. It can be found that each pair is significantly different; the significance values are 0.007 and 0.027, respectively. This means that the legal forms, location and whether they received supports or not should have some relationship. Accordingly, the correlation test will be used to find what the relationship is between these elements.

Table 7-37: T-test (Location*Government Support and Legal Form)

Location	Value	Df	Asymp. Sig. (2-sided)
Government support	7.187	1	.007
Legal Forms	5.791	1	.027

Source: Author's Fieldwork

Table 7-38 shows the result of the correlation tests. It can be found that legal forms and location have negative relationship (0.274), and there is positive relationship between location and government support (0.274). This indicates that on-park firms are more likely to be privately owned firms and, also, they are more likely to receive government support. But there is no significant relationship between legal forms and government support. This means that state-owned SMEs and privately owned SMEs do not have a significant difference in terms of

getting government support. However, location has some sort of relationship with both legal forms and receiving government support. Therefore, the author will take on-park and off-park firms separately and test whether the legal forms and receiving government support have any relationship or not.

Table 7-38: Correlation (Location & Supports and Legal Forms)

		Legal form	Receive Support
Location	Correlation	-.274*	.274**
	Coefficient		
	Sig. (2-tailed)	0.11	0.01

Source: Author's Fieldwork

Table 7-39 shows the results of the Spearman's rank correlation test between legal forms and receiving government support within the condition of location. It can be found that the relationship between legal forms and receiving government support only exists within off-park firms. It implies that outside of a science park, the state-owned SMEs are more likely to get government support, while privately owned SMEs are less likely to receive government support. Legal forms do not have significant influence on receiving government support or not for on-park firms.

Table 7-39: The Influence of Firms' Locations

		Outside Science Park	Inside Science Park
		Receive Government support	Receive Government support
Legal Forms	Correlation	.306*	-.044
	Coefficient		
	Sig. (2-tailed)	.033	.798

Source: Author's Fieldwork

To understand to what extent the legal forms affect the government support, the author examined privately owned firms and state-owned firms separately and tested the relationship between location and receiving government support.

This involved testing privately owned firms and state-owned firms separately to understand whether the location selections of a firm have a strong relationship with receiving government support or not. Table 7-40 shows the result of the correlation test. It can be found that the difference only exists among privately owned firms. There was strong positive relationship between location and government support regarding privately owned firms only. It implied the private on-park firms were more likely to receive government support, while private off-park firms have fewer opportunities to receive government support.

Table 7-40: The Influence of Legal Forms by Type of Ownership

Privately Owned Firms			State-owned Firms		
Location			Location		
Government support	Correlation	.374**	Government support	Correlation	0.000
	Coefficient			Coefficient	
	Sig. (2-tailed)	.002		Sig. (2-tailed)	1.000
	N	68		N	18

Source: Author's Fieldwork

According to the previous two correlation tests, it can be concluded that the location of a firm does not have any influence on receiving government support or not if this firm is a state-owned firm. However, as a privately owned firm, if starting business outside of a Science Park, then this firm has relatively few possibilities to get government support.

7.5.2 Science Park

This section will study on science parks to understand what advantages and disadvantages they bring. Within 96 respondents, 40% of participants were from on-park firms and 60% were from off-park firms.

Table 7-41 illustrates the reasons why they located inside of a science park. Five reasons for locating inside a science park were mentioned in more than 10% of responses. It can be found that the most frequently concerned reason was because they were originally located nearby, which can be seen as their objective

attributes. More than one-fifth of respondents chose to develop their businesses not because of any benefits they perceived, but convenience. Next most frequently considered reason was that the science parks were more geared towards government policies, which provided better access to government support. Furthermore, they were also attracted by the lower maintenance costs they could get from a science park, such as lower rent and housing subsidies. Finally, it can be seen that the networking benefit was less concerned by participants.

Table 7-41: Why inside a Science Park

Why in a Science Park			
	Subclass	Main Class	Percentage
1	Originally Located Nearby	Convenience	21%
2	Better Access to Advanced Information About Policy Tendencies	Government	16%
3	Better Access to Government Support	Government	15%
4	Low Rent	Finance	14%
5	Was Attracted by Cluster Effect	Networking	13%
6	Housing Subsidies	Finance	8%
7	To Expand the Network	Networking	4%
8	Was Attracted by Beijing Hukou Quota	Government	3%
8	Better Access to Advanced Information about Market	Market	3%
9	Better Access to Capital Market	Finance	2%
10	Just Responded to the Call of Government	Government	1%

Source: Author's Fieldwork

Table 7-42 shows the reasons for locating outside of a science park. It can be seen that off-park firms mostly have no positive attitude about science parks. They do not believe there would be any differences between on-park and off-park firms. This can be interpreted in three ways. First, the science park did not benefit on-park firms, or at least some on-park firms gave them this impression. Second, the science park or the government did not promote or work well enough to attract these firms. Thirdly, these firms had confidence to operate well outside of a

science park. The second most commonly stated view was convenience. The science park was too far away from most employees and customers.

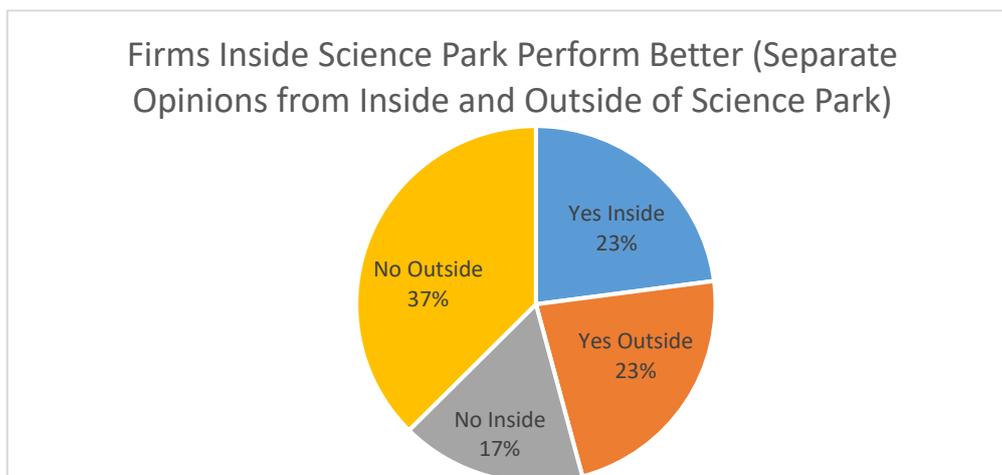
Table 7-42: Why Outside of A Science Park

Why Outside of a Science Park			
	Subclass	Main Class	Percentage
1	Do Not Think Joining a Science Park Will be Conducive to the Development of Firms	Perception	23.93%
2	Consideration About Geographical Distance for Employees	Convenience	17.95%
3	Not Familiar with Science Parks	Others	12.82%
4	Consideration About Geographical Distance to Main Customers	Convenience	11.11%
4	Do Not Think There Are Any Differences Between Operating Firms In and Outside of A Science Park	Perception	11.11%
5	Do Not Think Qualified to Join a Science Park	Less Ability	9.40%
6	Have Enough Resources to Develop the Firm (e.g. Network, Human Capital, or Money)	Confidence	7.69%
7	Discouraged By Complicated Application Procedures	Others	5.98%

Source: Author's Fieldwork

Now there remained a question as to whether participants thought locating inside a science park would benefit their operation. Figure 7-3 shows their opinion as to whether firms inside a science park perform better or not. It can be found that there were 46% participants among all responses who believed the on-park firms performed better, while 54% participants did not agree with this. If separating the participants from their location, it can be seen that more participants inside a science park believed on-park firms performed better, while more participants outside of a science park believed there were no differences between on-park and off-park firms (see Figure 7-3).

Figure 7-3: On-park Firms Perform Better



Source: Author's Fieldwork

Table 7-43 shows the reasons for performing better and no different. It can be seen that four reasons were the most common ones for participants to believe the firms inside a science park can perform better, which, altogether, accounted for more than three-quarters. The most important reasons were about the government policies and networking advantages. Participants who believed the science parks can provide better access or information to government supportive policies and the networking advantages can benefit firms thought on-park firms performed better than off-park firms. On the other hand, the most frequently mentioned reason for people not perceiving any difference was that they thought market demands were the main source for the development of firms, which accounted for more than 50%. Other reasons were less concerned by respondents.

Table 7-43: Better Performing Reasons

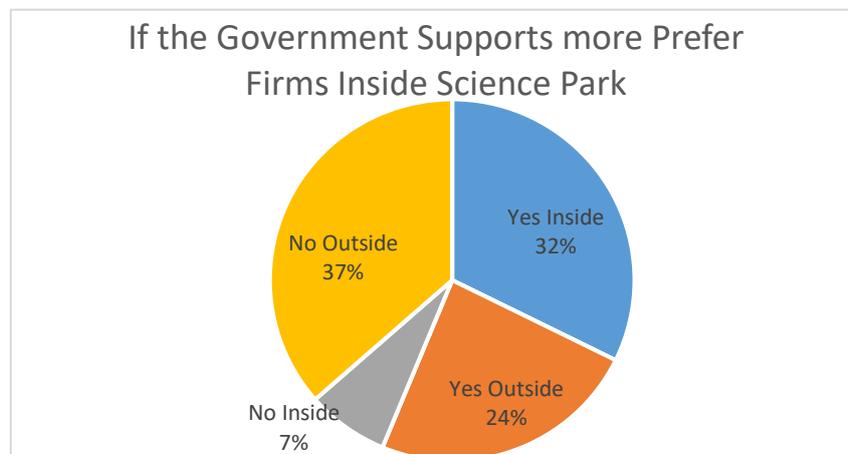
Performs Better	
1	Advanced Information: About the Policy Tendency 22.39%
2	Expanded Network 20.15%
3	Better Access to Government support 17.91%
4	Advanced Information: About the Market 16.42%
5	Better Access to Finance 7.46%

5	Science Parks Can Help Remedy Firms' Limitation	7.46%
6	Housing Subsidies	4.48%
7	Lower Rent Fee	3.73%
No Different		
1	Market Demands are the Main Source For the Development of Firms	57.29%
2	Firms Outside of Science Parks Can Also Get Essential Advanced Information	17.71%
3	Firms Outside of Science Parks Can Operate with More Flexibility	13.54%
4	From Outside of Science Parks Can Also Get Access to Governmental Resources	11.46%

Source: Author's Fieldwork

As illustrated in Table 7-43, the most important reason was that people believe science parks can provide better access to government support or information about government support. Thus, it is necessary to understand whether government support more favours firms inside a science park. Forty-four per cent of responses did not think that government gave priority for on-park firms, while 56% of responses felt on-park firms have some priority compared with off-park firms (see Figure 7-4). Similar to the previous question, on-park firms believed there were differences when government select target firms, while off-park firms thought government did not give priority to on-park firms. Specifically, it can be seen that more than 80% on-park firms believed the government support was partial to on-park firms. However, the opinions among participants from outside of science parks were quite even, which were 40 to 60.

Figure 7-4: Priority



Source: Author's Fieldwork

Table 7-44 gives the reasons for each side’s opinion. Three main reasons made people believe the supports gave priority to science parks; each reason had more than 20% responses. It can be found that the advantages of geographical concentration, general assumption to be well-run firms and government connections of each science park were put as the most important reasons. For the participants who believed there was no priority from government, they thought the market conditions were fair and government criteria was the same for firms who applied for the supports.

Table 7-44: Priority (Reasons)

Supports Gave Priority to Science Park		
1	Geographical Concentration (Not Usually Forgotten or Ignored)	24%
2	Generally Assumed as Well-run Firms	23%
3	The Science Park Has Strong Connection with Government	21%
4	The Science Park Has Government Background	13%
5	Advanced Information (the Science Park Passes Information Quickly)	10%
6	The Science Park Could Help Remedy Firms’ Limitations	8%
7	Advanced Information (Get Information from Other Firms in the Same Park)	2%
No Priority		
1	There Exist Competitive Firms Outside Science Park	30%
2	Targets Are All High-tech Firms in Beijing	25%
3	Can Receive the Same Information From Government Outside of Park	23%
4	Did Not Feel Any Differences	23%

Source: Author’s Fieldwork

7.6 Summary

This chapter used quantitative data to examine the effectiveness of government policies on technology-based SMEs and entrepreneurship. Table 7-45 shows the associated research questions.

Table 7-45: Associated Research Questions

Research Aim		
To examine the effectiveness of government policies on technology-based SMEs and entrepreneurship in Beijing, China		
Objectives	Research Questions	Section
1) To identify the influential factors of entrepreneurship	ii) How do external and internal influencing factors affect entrepreneurial activities?	7.2.1
2) To identify the characteristics of technology-based SMEs	i) What are the limitations of technology-based SMEs?	7.2.2/7.2.3/ 7.2.4
	ii) Do state-owned SMEs and privately owned SMEs have different advantages and barriers?	7.3
3) To examine the effectiveness of policies targeted at technology-based SMEs and entrepreneurship	i) How effective are those policies from entrepreneurs' perspectives?	7.4
	ii) Do the policies affect the views of entrepreneurs towards the research questions 1(ii) and 2(i)?	7.4.2
4) To explore the relationship between the performance of technology-based SMEs within and outside government-created Science Parks	i) What are the differences between on-park and off-park firms?	7.5.2
	ii) Do the legal forms (state-owned and privately owned) affect the results of research question 4(i)?	7.5.1

Source: Author's Fieldwork

To respond to research question 1.ii, it is believed that government support on starting and developing businesses is relatively strong, but the state of SMEs is still low. Other influencing factors, such as economic, social and cultural factors, might, to some extent, negatively affect perception of entrepreneurs on the state of SMEs. Especially, people who perceive higher level of SME supports might assume a higher state of SMEs. However, entrepreneurship supports do not significantly change entrepreneurs' perceptions on the state of SMEs. Thus, from the perspectives of policy, it is suggested that SME policy has a direct influence

on the state of SMEs, while entrepreneurship policy might affect the state of SMEs indirectly, such as influences on social or cultural factors.

Section 7.2.2, 7.2.3 and 7.2.4 are in response to research question 2.i. Financial limitations are at the first place among all limitations in both infant stage and development stage (strongly significant), but financial limitations at infant stage are more significant than those at development stage. Unfavourable entrepreneurship environment is considered as the second most significant barrier for start-ups (strongly significant), which shows that the entrepreneurship environment is not very encouraging. Tax burden is at the third place in both stages of businesses. Government-related barriers are at the last place when starting businesses, while at development stage, entrepreneurs' attributes are the least considered. Government-related barriers are increasingly significant when developing businesses, which implies that the supervision system of government is for matured firms than for firms in the infant stage. Entrepreneurs' personal abilities are more important in the infant stage, because start-ups have fewer employees and the SMEs are mostly operated by owner-managers.

Furthermore, in the development stage, network barriers have positive relationships with innovation barriers and entrepreneurial barriers. It might imply that efficiently supporting technology-based SMEs, helping to build up networks and creating opportunities for getting access to information and guidance might, in the meantime, remove innovation barriers and entrepreneurial barriers to a certain degree. In the infant stage, government-related barriers have positive relationship with network barriers and market related barriers. It might be inferred that discouraging monopoly, simplifying legal procedures and providing more government support might help to remove network barriers and market barriers to some extent. However, those suggestions still need to be further investigated with richer data. Moreover, financial barriers have positive relationship with entrepreneurship environment. It had also been suggested in the qualitative analysis chapter that to some extent, discouraging entrepreneurship environment

causes financial limitations and/or financial limitations may cause a less favourable entrepreneurship environment. Positive image of entrepreneurship increases the possibilities of external investment and, thus, lessens the financial barriers. Finally, the government-related barriers in the infant stage have strong positive relationship with other barriers in both infant stage and development stage. This might implies that advanced government regulation and government support can promote the development of technology-based SMEs and improve the quality of SMEs, not only for the infant stage but also for the development stage. The negative relationship between government-related barriers in the development stage and SME/entrepreneurship policy indicates that removing government-related barriers for established firms may improve their perceptions regarding the policy effect.

Almost half of the respondents started their businesses with self-raised funds and followed with government-involved capital, VC and bank loans. It is hard for start-ups to finance from external resources. At the follow-up stage, bank loans are the most frequently used methods for raising additional capital. However, less than half of respondents already had or planned to raise additional capital; while more than 50% did not have a clear plan about future financing. This implies that most people do not want to take risks to raise additional capital, or entrepreneurs in small firms do not have the need to grow their businesses.

Finally, internationalisation barriers were investigated in Section 7.2.4. Only 20% of respondents had expanded into international markets. The author compared the barriers entrepreneurs perceived, supports from government and advantages for internationalisation, and found that there exists, to a considerable extent, a mismatch between government support and the needs of technology-based firms in terms of internationalisation.

Section 7.3 examined research question 2.ii. In terms of internationalisation and government support, state-owned firms are more inclined to perceive advantages, while privately owned firms are more likely to perceive advantages in terms of

culture and R&D. Furthermore, privately owned firms think more highly about the state of SMEs than state-owned firms, but privately owned firms are more likely to think that entrepreneurship policies are not as supportive as state-owned firms think. When developing businesses, privately owned firms are more likely to meet financial constraints than state-owned firms. In addition, entrepreneurs from privately owned firms do not consider entrepreneurial-related barriers as significant as state-owned firms. It implies that private entrepreneurs might be more confident in their personal abilities than those from state-owned firms.

Section 7.4 was to answer policy-related questions associated with objective three. Tax relief and human capital supports are the most frequently used supportive methods, followed with direct and indirect financial supports. Network supports and internationalisation supports are the least frequently used supportive methods. On the other hand, entrepreneurs consider tax relief and direct financial supports as the most important supports they need, followed by internationalisation and market supports. Human capital and indirect financial supports are the least important supports they consider. It can be found that entrepreneurs prefer supports from government that can have direct benefits for their operation, such as tax relief and direct financial supports. Government also uses tax relief as the most important tool, but human capital supports are the second most frequently used methods, which may positively promote the development of SMEs in the long-term. It should be noted that financial supports, direct and indirect, are also applied quite frequently. Thus, although there seems to exist some mismatches between policy implementers and policy receivers, it might be because both sides consider useful supports from different angles. Entrepreneurs as individuals may prefer direct supports that benefit their daily operation, while policy makers incline to apply policies that benefit a wide range of target groups and have long-term benefits. Increase in operational revenue, increase in R&D expenditure and higher level of brand recognition are the most significant benefits for firms who received government support, which account

together for more than 60% of responses. Thus, it is believed that the policies are quite effective.

The qualification of technology-based SMEs is important for firms to get government support. National high-tech firms are more likely to receive government support. Furthermore, firms receiving government support are more likely to have a positive view of the government SME policy. The positive relationship between financial/market barriers and government support indicates that firms who perceive higher barriers are more likely to apply for government support. Government support might attract risky companies. But this adverse selection only exists among firms older than seven years. Of firms that received government support, most believed they were qualified and exemplary. Less than 17% thought they received supports because of connections with government. Around 70% of those who did not receive government support believed the reasons for being neglected were that they did not apply and/or the potential of firms was not recognised. Less than 14% thought the firms received supports because they had some connections with government or policy implementers. Almost 70% believed receiving government support will make a difference when running businesses. The differences exist because government support may help improve the brand recognition, decrease operational cost and spread useful information. But some respondents did not think there are differences between firms which did or did not receive supports, because they think the market condition is fair and the survival of a company should rely on the market power and companies' capabilities.

The last objective and the associated research questions were examined in Section 7.5. The location is especially important for privately owned firms because on-park firms have more chances to receive government support than their counterparts. This significant difference does not exist among state-owned firms. Convenience is the most important reason for firms to set their location, followed by government-related benefits. Firms who start businesses outside of

science parks believe the location does not affect their operation and/or they more consider the geographical distance with employees and customers than other benefits brought by science parks. 46% believed that on-park firms perform better than off-park firms; while 54% did not think the location mattered to firms' performance. The former group believed that science parks can spread useful information and also help expand the networks, while the latter group believed the market demands are the main source for the development of firms and the useful information and government support are equally available for off-park firms. However, 60% of thought that government support does more favour on-park firms. On-park firms are geographically concentrated, thus hard to be forgotten or ignored; and they are generally assumed as well-run firms. Furthermore, the strong connections between science parks and government are also considered as the reason for support bias. But quite a considerable number of responses indicated a belief that government does not give priority for on-park firms because there exist competitive firms outside of science parks and government gives equal opportunities for firms regardless of the locations.

8. Conclusion

8.1 Introduction

This thesis examined the effectiveness of government policies on technology-based SMEs and entrepreneurship in Beijing, China. Growing interest among policy makers in the importance of SMEs and entrepreneurship increasingly drives policy designed to support small businesses and entrepreneurial activities. Many government documents have been released to support the development of technology-based SMEs in Beijing. Some researchers have already studied and examined the policies released for supporting technology-based firms (Huang et al., 2004; Liu et al., 2011), but those researchers mainly focussed on the description of policy frameworks and a comparison of policy dynamics. There is a lack of studies examining the effectiveness of policies from the perspectives of entrepreneurs in this context. Therefore, this thesis aimed to examine policies from the perspectives of entrepreneurs to explore whether the supply of policies matches the demands of technology-based SMEs. The scope of this final chapter is to highlight the main findings of the study in light of the four objectives of the thesis, as well as present the implications derived from these findings.

The chapter begins with a discussion of the research objectives and the associated research questions in the context of the research findings. Furthermore, the key contributions of the thesis, both methodologically and theoretically, will be discussed. In concluding this chapter and the thesis, the limitations of the study will be considered, as well as the possible directions of future research following this study.

8.2 Key Findings

This section presents a summary of the main findings of this research from both qualitative and quantitative research. A general conclusion is that policies do have strong positive effects on the promotion of entrepreneurship and development of technology-based SMEs. Table 8-1 illustrates the research objectives and associated research questions, as well as the related sections.

Table 8-1: Location of Results in Relation to Research Objectives and Questions

Research Aim		
To examine the effectiveness of government policies on technology-based SMEs and entrepreneurship in Beijing, China		
Objectives	Research Questions	Section
1) To identify the characteristics and influential factors of entrepreneurship	i) How are policies implemented from policy documents?	5.2/6.5.1
	ii) How do external and internal influential factors affect entrepreneurial activities?	6.2.1/6.2.2//6.2.3/6.2.4/7.2.1
2) To identify the characteristics of technology-based SMEs	i) What are the limitations of technology-based SMEs?	6.3/7.2.2/7.2.3/7.2.4
	ii) Do state-owned SMEs and privately owned SMEs have different advantages and barriers?	7.3
3) To examine the effectiveness of policies targeted at technology-based SMEs and entrepreneurship	i) How effective are those policies from entrepreneurs' perspectives?	6.4/7.4
	ii) Do the policies affect the views of entrepreneurs towards the research questions 1(ii) and 2(i)?	7.4.2
4) To explore the differences between on-park and off-park technology-based SMEs	i) What are the differences between on-park and off-park firms?	6.5/7.5.2
	ii) Do the legal forms (state-owned and privately owned) affect the results of research question 4(i)?	7.5.1

Source: Author's Fieldwork

8.2.1 Objective One

To Identify the Characteristics and Influencing Factors of Entrepreneurship

This objective was researched by two research questions. The first research question was to understand the political background in terms of policy implementing procedure. The second research question was to understand the internal and external influencing factors of entrepreneurial activities in Beijing.

i) How are policies implemented from policy documents?

It is suggested in the literature review chapter that China's political system is centrally-controlled regional decentralisation (Xu, 2011). Every local government has the right to release their own policies and regulations without prejudice to the national policy designs (Xu, 2011). But it is different to federalism because

Chinese officials in each local department are appointed by national government. Thus, the policies and regulations at the local government levels are at a modified independence that can never go beyond or be different to national policies.

From the document analysis and interviews, it can be found that the state formulates the policy framework. It will set up the aims of policies, which normally do not contain much detailed implementation methods, whereas local government policies do have clear implementation tools. As indicated by Saich (2001), Chinese local government has the *de jure* legislative power on the local society and economy. It is also reflected from policy setting. Local policies have stronger direct influences on the development of local enterprises than national policies. Science park regional policies affect the development of on-park firms. Science parks in China are more like a product of policy; it is government behaviour. It is slightly different with the national definition of a science park that is considered as a geographic region for commercialising technology achievements (Westhead and Batstone, 1998; Bergek and Norrman, 2008). Science parks in China are policy executors, but while they have rights to produce their own regulations, this is under the supervision of national and local governments. Thus, national policies, local policies and science park regional policies exhibit a vertical structure, wherein local government and science parks are also the policy executors.

ii) How do external and internal influential factors affect entrepreneurial activities?

According to the survey results, participants thought the state of SMEs is low in Beijing, and also thought the entrepreneurship environment in Beijing is strongly unfavourable. Both results indicate that the social and cultural factors (Reynolds et al., 2002) as influential factors of entrepreneurship are not positive. However, from both interviews and survey, it is found that the participants generally thought that the policies are quite supportive for the development of entrepreneurship and SMEs. Furthermore, interview results recommended that fast economic growth and uneven economies between urban and rural areas positively affect the growth of entrepreneurship. Therefore, the political (Reynolds et al., 2002) and economic (Lee & Peterson, 2000) factors should have positive influences on the development of entrepreneurship and SMEs in Beijing. In Shane's (2003)

entrepreneurship model, the opportunities are generated by surplus from technological (Shane, 1996), political/regulatory (Holmes and Schmitz Jr., 2001) and social-demographic changes (Shane, 2003). From the interviews, advanced information and communication, increasing demand of innovation and increasing collaboration between firms and research institutions generate technological changes. Decrease of entrance barriers, promotion of science parks to build clustering effects and increasing supports of technology sectors generate political/regulatory changes. Growing market, uneven development between rural and urban areas and the growing positive images of entrepreneurship generate social and demographic changes. All these changes create great entrepreneurial opportunities.

As indicated in the literature chapter, the entrepreneurial process needs opportunities, motivations and skills (Lundström and Stevenson, 2005). All the changes mentioned above create opportunities, but there still need to be motivations and skills to discover and exploit those opportunities (Shane and Venkataraman, 2000). Interviewees highlighted the importance of previous jobs for the entrepreneurial activities. The networks they got from previous jobs provide them access to new information and the knowledge they get also makes them understand the value of the information. Venkataraman (1997) argued that people can get useful information through their previous jobs and the information provides the access to opportunities. Furthermore, the technology and knowledge people acquired from previous experience provides them abilities to recognise the value of new information and make it commercialised (Cohen and Levinthal, 1990).

Once the opportunities are recognised, people should have the motivations to start businesses, and also have the skills to start and maintain the businesses (Lundström and Stevenson, 2005). As argued by Lundström and Stevenson (2005), motivation includes the desirability and feasibility of entrepreneurship as a career and employment option. Therefore, the reasons people take self-employment as an employment option and be willing to start businesses can be seen as motivations. From the interviews, people who start businesses prefer to make decisions by themselves. They have the need of achievement, which can be seen as motivations for starting businesses. The passion for their own work is also considered as a motivation.

“Skills” are operationalised in terms of technical, business and entrepreneurial skills and know-how (Lundström and Stevenson, 2005). The author identified “innovative”, “comprehensive skills” and “be able to estimate risks” as the necessary skills according to interviews. In addition, the necessary knowledge and technology should be “skills” as well.

8.2.2 Objective Two

To Identify Characteristics of Technology-Based SMEs

This objective was researched by two research questions. The first research question was to investigate the limitations of technology-based SMEs in Beijing and the second was to explore whether state-owned and privately owned firms perceive different level of limitations.

i) What are the limitations of technology-based SMEs?

Technology-based SMEs have the limitations in terms of internal resources and external effects (North et al., 2001). Financial shortages, human capital limitations and market barriers were introduced in the literature review chapter.

Financial limitation is a significant problem for not only young firms, but also old firms. From the survey it can be found that financial limitation is the most significant barrier among all barriers for both starting and development stages. Interviewees indicated that young firms are generally assumed to be highly risky, while matured firms generally meet the challenge that the external financial supply does not meet their financial demand. Carpenter and Perersen (2002) suggested that high-tech sectors experience higher level of information asymmetry and, thus, meet more financing constraints and funding gaps. It is proved to be true in this research; a lack of an evaluation system for intangible assets gives a higher chance of information asymmetry and, thus, it is hard for technology-based SMEs to get access to external finance, especially for young and new firms. It has been recommended by asymmetric information and signalling theories (Michaelas et al., 1999) that monitoring is more expensive in small firms and, thus, significant moral hazard and adverse selection occurs when lenders have less information to ascertain the risk level.

According to tax-based theories, small businesses use less debt because they are less profitable and, thus, do not enjoy the benefit brought by debt which can

shield income from taxation. In addition, small firms have lower marginal tax rates, which lessen their motivation to get loans (Pettit and Singer, 1985). However, it seems less the case in China. Total tax rate is very high in China (WorldBank, 2015), and tax is considered by survey participants as the third most significant barrier for starting and developing businesses. SMEs enjoy the same marginal tax rates as large firms, unless they are very small and make very little profit. Tax-based theories do not support the reason for SMEs in Beijing using less debt. As a subjective reason, more people agree that technology-based entrepreneurs do not get additional capital from banks or other sources because they already have the capital base and they do not have a need to raise capital from external sources. For this group of entrepreneurs, they should meet less financial constraint.

Market-related barriers in terms of R&D disadvantages and unfair market conditions are the most frequently mentioned barriers according to the interviews. Hall (2002) argued that the R&D investment is the degree of uncertainty associated with its output because the R&D costs create intangible assets that generate profits in future years. R&D costs are especially high for SMEs compared with their counterparts (Hyytinen and Toivanen, 2005); even just imitating a new invention costs 50-70% of the cost of the original invention. However, it is not true according to the interviews. Since the R&D costs are relatively high for SMEs, small and young technology-based firms tend to do informal R&D, as well as matured firms with capital shortages, which costs less than conducting R&D formally. This phenomenon increases the R&D difficulties for mature firms with sufficient capital. Because they either do independent R&D or rely on external sources, the acquisition process is much more standardised, which raises the costs. The high inputs, coupled with the fast changing market demand and the risks of being copied, increase the risks of market failures for firms who are doing regular R&D. It can be seen as a Chinese policy loophole that the supervision system of government is stronger for mature firms than for firms in the infant stage.

Unfair competition with politically-connected firms is also considered as a significant market barrier. Government-related barriers, such as “complicated legal procedures” and “lack of access to government supports”, attract increasing attention from entrepreneurs with the development of firms. In the start-up stage,

entrepreneurs have less concern about government-related barriers, while they are more likely to meet entrepreneurial-related barriers, such as their personal abilities. Empirical studies have argued that SMEs experience barriers due to legal environment and unfair market competition, which is especially serious in less developed economies (Krasniqi, 2007; Mian and Khwaja, 2004). From a study in Pakistan, Mian and Khwaja (2004) also suggested that politically-connected firms borrow twice as much. Guo and Miller (2010) argued that the most important ways Chinese entrepreneurs address problems is through *guanxi*. Interviewees highlighted that the market competition is extremely fierce, which is magnified by human factors. When competing for the same resources, the firms without any *guanxi* with government might take higher costs, which make for earning dilutions. In addition, compared with politically-connected firms, the firms find it harder to access external supports. This point was highlighted by interviewees when talking about financial limitations. Interviewees suggested that, without *guanxi*, it is hard for private enterprise to get access to external capital. It can be seen as one of the main reasons that firms suffer from financial limitations.

It is recommended that one of the most important reasons that make SMEs less productive is a lack of human resource (Roberts, 1992). Innovation and human capital have a positive relationship (Thurow, 1996). The inadequate abilities in terms of human capital pull down the overall performance of SMEs (Oberschachtsiek and Scioch, 2011). However, human capital limitations were only mentioned by interviewees from the service industry. Human capital barriers were not considered by interviewees from other industries. This implies that these firms might be less innovative and, thus, have less need for high quality human capital, or their innovation might initially adopt from external resources that require lower technological skills.

It is indicated that SMEs can rarely succeed without networking with other firms (Huggins and Williams, 2009). A network of public and private local institutions benefits from clusters (Ceglie and Dini, 1999). Especially service sectors and high-tech sectors are more inclined to clustering. According to the interviews, it can be found that network and information are considered as the same element. Science parks are the most common clustering areas and those are considered as an important source of “network”. The people who have difficulty in accessing useful information can take advantage of science parks. Science parks act as a

bridge between technology-based SMEs and governments, agencies, or other firms. In the quantitative analysis, networking barriers have a strong positive relationship with human capital (Innovation) barriers. It was recommended by (Keeble and Nachum, 2002) that a knowledge-based cluster is also associated with the evolution of innovation. Dana (2001) also highlighted the positive influence of networks in cultivating entrepreneurial skills.

It was highlighted by interviewees that technology-based SMEs in Beijing face significant barriers when expanding into international markets. The literature suggested that increasing numbers of small technology firms expand into the international market after their infant stage (Fillis, 2001). But both qualitative data and quantitative data show different results to that. Different regulations and laws, technology gaps, lack of capabilities, no long term plan and weak VC are the main barriers for technology-based SMEs entering international markets. "Born global" firms first emerged in countries with small domestic markets (Moen and Servais, 2002; Rennie, 1993). This might explain the reason that technology-based SMEs in China do not internationalise from the infant stage. Interviewees suggested that the local market is big enough to make profit and, thus, have no motivations to expand into international markets. It was suggested by interviewees that firms who have networks with foreign markets, strong capabilities, international experienced human capital and have products designed to meet foreign markets are more inclined to expand into international markets. Those points were recommended by scholars. McDougall and Oviatt (1991) argues that entrepreneurs with international experience are more likely to drag firms to international markets. Glickman and Woodward (1989) and McDougall, Shane and Oviatt (1994) suggested that new ventures with international vision from inception and strong market networks are more likely to survive in international markets. The network and innovation are increasingly important for the internationalisation of small firms (Anderson, 1993; Fillis and Mcauley, 2000). Although there are not many technology-based SMEs already doing international businesses, the interviewees mentioned that they had some connections with the international market to some degree, such as communications with foreign firms and expertise, investment by international VCs and attending international showcases. This implies that entrepreneurs have

started to be more aware of international opportunities and have motivations to meet international challenges, even though it still remains in the initial phase.

ii) Do state-owned SMEs and privately owned SMEs have different advantages and barriers?

There are some differences between state-owned and privately owned enterprises in terms of their perceived advantages and barriers. State-owned firms think they have more advantages when expanding into international markets and they are more likely to receive government support. Privately owned firms are more likely to think they have advantages on R&D, and they are more familiar with local culture. The state-owned firms are also known as government-owned firms (Dewenter and Malatesta, 2001) and, thus, they should have a closer relationship with government. Thus, it makes sense that state-owned firms perceive higher advantages regarding government support. Furthermore, it is suggested that publicly funded R&D will replace privately funded R&D, which will decrease the motives to fund R&D at a private level (Almus and Czarnitzki, 2003). When the full crowding-out effects occur, there is no technological performance (Czarnitzki and Hussinger, 2004). Because of information asymmetries between government agencies and innovative firms, as well as the moral hazard, it increases the possibilities of improper usage of government funds (Czarnitzki, Hanel, & Rosa, 2011). Thus, privately owned firms who do R&D with their own funds might have a better R&D ability than state-owned firms who have more chances to be sponsored by government.

It has been highlighted by the literature that younger international firms more rely on tangible assets, such as financial and human resources, while younger international firms are more likely to rely on intangible knowledge-based capabilities ((Knight and Cavusgil, 2004). Although privately owned firms have better advantages regarding R&D, they do not think they are easier to enter international markets. Thus, it implies that, when China's firms are expanding into the international markets, they do more rely on the tangible assets. When investigating the perceived barriers, it can be found that privately owned firms are more likely to have financial barriers than state-owned firms. It also explains that, currently, rather than technological capabilities, China's international firms more rely on tangible assets. Mian and Khwaja (2004) suggested that politically-

connected firms borrow twice as much and have 50% higher default rates. Thus, privately owned firms are more likely to meet financial constraints compared with state-owned firms. Privately owned firms are more confident in their entrepreneurial capabilities than state-owned firms. When investigating financial limitations, the interviewees mentioned that, when government capital is involved, there are higher possibilities to be monitored. The entrepreneurs in state-owned companies need to firstly consider the needs of government, which does not meet the definition of entrepreneurs.

8.2.3 Objective Three

To Examine the Effectiveness of Policies Targeted at Technology-based SMEs and Entrepreneurship

This objective was researched by two research questions. The first research question was to examine how effective the policies are. Finally, whether the policies affect entrepreneurs' views on entrepreneurship environment and whether there is any relationship between policies and barriers that entrepreneurs perceived were examined in the last research question.

i) How effective are those policies from entrepreneurs' perspectives?

The author compared the rankings from survey participants between the frequently received supports and important supports they perceived. It can be found that entrepreneurs more prefer direct benefits, such as tax relief and direct financial supports, which can directly benefit their daily operations. Policy makers not only focus on these direct supports, but also consider indirect supports that can benefit and promote the development of SMEs and industries in the long-term. It can be found that government also adopts human capital supports and indirect financial supports as important supportive tools, which individual entrepreneurs do not much appreciate. It seems there is a mismatching between what entrepreneurs need and what policy supplies, but this is because of the different considerations between the two groups. Swinnen and Gow (1999) recommended that, rather than direct supports, investing in public goods or infrastructure might generate better effects for long-term development. In addition, the quality of human capital rather than financial capabilities ultimately influences the survival rates of SMEs (Cressy, 1996) and the financial supports are not

beneficial for long-term performance of SMEs. Increase in operational revenue, increase in R&D expenditures and higher level of brand recognition are the most significant benefits of receiving government support. Around 70% of survey participants believed that there are differences when running businesses between firms that do and do not receive government support. Thus, it is believed the policies are relatively effective.

There are some drawbacks to those policies according to the interviews. The main problems are associated with financial supports and R&D supports. There is lack of follow-up supervision and evaluation system. According to agency cost theory, the stock holders have incentives to benefit themselves at the expense of bondholders (Michaelas et al., 1999). Adverse selection happens when lenders have less information to ascertain the risk levels (Cowling, 1998). This adverse selection also happens when government selects supportive targets. Governments do not have a clear follow-up supervision and evaluations system to avoid this type of adverse selection.

In terms of R&D supports, interviewees suggested that firms who received government financial supports do not have as strong motives to do R&D as firms who are self-financing R&D. It was recommended by Czarnitzki and Hussinger (2004) that public funds might replace private investment. Entrepreneurs have more motives to carry on R&D when funded by themselves, because they need the market return as soon as possible. Thus, it still needs a better supervision and evaluation system to ensure that government capital does work efficiently. Furthermore, in order to avoid such information asymmetry, China's local government normally takes action that just simply selects mature firms rather than young firms. Small firms generally have higher levels of information asymmetry because of the varied quality of financial statements (Cowling, 1998). However, interviewees said that some high-tech small and young firms might be neglected, even though they have potential.

ii) Do the policies affect the views of entrepreneurs towards the research questions 1.ii and 2.i?

Firms who are qualified as National High-tech firms are more likely to receive government support. As mentioned in the document analysis, qualifying as national level high-tech firms is significantly difficult for young and small firms.

Furthermore, receiving government support does affect entrepreneurs' perceptions towards SME policy. The entrepreneurs who receive government support are more inclined to have a positive view on government policy. But this relationship only exists with SME policy rather than entrepreneurship policy. Thus, from another view, it implies that governments are more inclined to support the development of SMEs, rather than supporting the infant stage.

Furthermore, it is found that entrepreneurs who perceive higher financial and market barriers are more likely to receive government support. This can be implied in two ways. First, government supports firms who have stronger difficulties. However, the supportive policies are to pursue overall economic growth. Firms who meet stronger financial and market barriers should not be the supportive targets. As recommended by Coad et al. (2014), due to the limited government resources, policy should support a small number of high performance firms rather than the large number of average firms. Thus, the second assumption is much more realistic, that firms who perceive higher financial and market barriers are more likely to apply for government support and, thus, have stronger possibilities of receiving government support. Survey results also showed that most barriers perceived by entrepreneurs have positive relationship with their perceptions of the state of the SME sector and SME/entrepreneurship policies. This indicated that firms who perceive higher level of barriers are more likely to think policies are supportive and the SME sector is strong and entrepreneurs who got government supports are more inclined to think highly of SME sectors and policies.

It should be noted that this adverse selection problem is very significant within firms older than seven years. Government support might attract higher risk companies. On the other hand, it indicates that there exist some problems when filtering supportive targets within firms older than seven years. It might imply a second policy loophole that, when selecting supportive targets, the conditions and filtering procedures are more relaxed for firms older than seven years.

8.2.4 Objective Four

To Explore the Difference between On-park and Off-park Technology-based SMEs

This objective was researched by two research questions. The first research question compared the differences between on-park and off-park firms. Furthermore, whether the legal forms of firms make any difference towards the first research question was examined in the second research question.

i) What are the differences between on-park and off-park firms?

Science parks act as a bridge between firms and other institutions. It was generally believed by interviewees that on-park firms perform better than off-park firms, because of the better operating environment in terms of taxation, financial subsidies, and qualification accreditation of enterprise and working conditions. Eul (1985) defined a science park as a geographic region that provide accommodation, facilities and resources. Enterprises located in the same area generate cluster effects (Ceglie and Dini, 1999) and the clustered firms face mutual opportunities and threats. The concentrations also engender some exclusive external economies, such as technical, administrative and financial matters (Cegile and Dini, 1999). Clustered SMEs seem to grow and upgrade more easily (Altenburg and Meyer-Stamer, 1999). In addition, 60% of respondents thought that government support does more favour on-park firms. Because they are geographically concentrated, they are, therefore, hard to be ignored and are generally assumed by policy makers to be well-run firms. As recommended by Coad et al. (2014), due to limited government resources, supporting high growth firms should be an efficient way to have better results. Interviewees mentioned that science parks can help them to do the paperwork and, if the firms do not meet the requirements of policies, the science park will try to guide the firm to improve in some certain ways. The information asymmetric problem happens when government has limited information about firms. Thus, it might happen that on-park firms can receive better supports. Furthermore, the strong connections between science parks and government are considered as the reason for supporting bias. As highlighted by interviewees, science parks in China are government behaviour, which is a policy tool. They have direct connection with government. Mian and Kijwaja (2004) and Krasniqi (2007) suggested that, in less developed economies, there is more likely to be unfair market competition. Guo and Miller (2010) argued that the most common way that Chinese entrepreneurs address obstacles to venture formulation is through guanxi. In this sense, on-park firms could receive more government supports as

they have connection with government to some certain extent. Therefore, on-park firms generally should perform better than off-park firms, as recommended by interviewees.

The most significant reason that makes firms start businesses inside of science parks is because they are geographically nearby rather than other benefits brought by a science park. Thus, the location selection does, to some extent, have contingency.

ii) Do the legal forms (state-owned and privately owned) affect the result of research question 4(i)?

It can be found that legal forms do not have influence on receiving government support or not when the firms are inside a science park. But it can be seen that state-owned firms are more likely to receive government support if they locate outside a science park. Furthermore, the privately owned firms are more inclined to be supported by government if they locate inside a science park, but there is no difference between state-owned firms. Based on both results, it implies that a significant difference only exists among privately owned firms. When privately owned firms locate inside a science park, they are more likely to receive government support. Guo and Miller (2010) mentioned that Chinese firms tend to address obstacles through *guanxi*. State-owned firms are also considered as government-owned firms (Dewenter and Malatesta, 2001), thus are supposed to have stronger connections with government. Science Park in China is a policy tool, which provides connections with government for on-park firms. Since state-owned firms already have connection with government, the science park might not help much in this sense. But conversely, privately owned firms who are unlikely to get access to government resources can benefit from this bridge. Thus, the science parks should benefit privately owned firms more than state-owned firms.

8.3 Key Contributions

This study explores the policy effects on the development of technology-based SMEs and entrepreneurship in Beijing. Although many scholars have examined and concluded policies in China (Huang, Amorim, Spinoglio, Gouveia, & Medina, 2004; Liu, Simon, Sun, & Cao, 2011), their main focuses are to

provide a description of the policy framework and compare the policy dynamics. One of the key findings that contributes to the enrichment of the policy framework is that the important role of science parks in policy framework as a policy maker and a policy executor is identified. First, science parks are the main policy executors in this sense in Beijing. Consequently, off-park firms can hardly get supports from government. It had been clarified in the analysis chapters that the recipients of SME policy thought it to be effective and non-recipients thought it to be ineffective. Thus, it is recommended that on-park firms are more likely to think highly of the policies. Second, the policy design is mostly based on the feedback from on-park firms. As highlighted before, science parks in Beijing act as the bridge between the local government and the on-park technology-based firms. It is more convenient for government to collect information from science parks rather than from off-park firms. Off-park firms are geographically decentralised, and the quality of the firms are uneven. Targeting at off-park firms may not only increase the human cost and financial cost of government, but also cause difficulties to assure the effectiveness of policies. Third, the science park is the one transmitting the latest policy information to on-park firms, no matter if they need it or not. How the policies are implemented from policy documents to real time support has been identified in this thesis and further provides the original contribution in this context.

Furthermore, entrepreneurship studies employ different models to explain entrepreneurial activities. Shane (2003) illustrated the importance of internal and external influential factors, while Lundström and Stevenson (2005) suggested an opportunity-motivation-skill model to explain entrepreneurial process. The author applied both models and explained the entrepreneurial process in the context of entrepreneurship in Beijing. This study provides an insight into entrepreneurs' perceptions of the influencing factors of entrepreneurship.

This study also applied different comparisons, such as start-up and development stage, state-owned and privately owned firms, SME policy and entrepreneurship policy, on-park and off-park firms, and do and do not receive government support. With those comparisons, the thesis provides a more comprehensive approach to answer whether the policies are effective and whether policies do work better in specific groups than their counterparts. Therefore, the approach of this study

provides a methodological contribution to the fields of entrepreneurship and policy.

The perception of entrepreneurs of the barriers they meet, and their perceptions of government supports have been examined in this study. Some problems of policy execution are shown in the study. First, the government supports might attract high risk firms and reduce policy efficiency. Second, R&D subsidies sometimes makes individual firms unwilling to privately fund R&D, and, thus, reduce overall R&D investment. Third, the lack of non-financial supports is concerned by interviewees since they believe non-financial supports can generate better effects than financial supports. Those results provide an important contribution to knowledge and those results can be applied by policy makers.

8.4 Limitations of the Study

In research, it is often maintained that even the most carefully designed studies will have limitations. For this study, the researcher has identified the following methodological limitations.

The methods used in this research have been explained in the methodology chapter. Each method has their own limitations, which is the reason that the mixed methods approach was used in the study to minimise the limitations. However, there are still some constraints which should be considered.

The first limitation that affects the procedure of research is the constraint of money and time. The fieldwork ran from February 2014 to the end of April 2014. In this period, document collection and analysing, as well as interviews, were in progress. The following questionnaire survey was collected until October 2014. The author applied face-to-face interviews, which required the author to stay in Beijing. This was time and money consuming. All secondary data and the access of participants had to be found by the researcher. The author could not rely on the formal research firms to collect primary data, because it also needs considerable money. Thus, only a small size of sample participated in the survey.

Second, this research is based on a relatively small size of sample, which might be challenged with limited generalisability. The convenience sampling approach is used in this research, which may result in poor quality data and lack of

intellectual credibility (Marshall, 1996). To minimise these drawbacks, the author tried to find samples from three different main technology-based industries and different government department to minimise the risk. In addition, the mixed method can also minimise the limitations. Each method is separate, but related. They can support the results to be valid.

Third, in terms of power imbalance, as the managers, entrepreneurs and public officials are normally at a higher hierarchy, they are more willing to control the pace of interview and, thus, would result in misleading interviews (Kvale and Brinkmann, 2009). To minimise this limitation, the author tried to keep on the research questions, and ensure the in-depth questions did not exceed the research scope.

Finally, since the participants in the research spoke only Chinese, it incurred translation and transcription issues (Twinn, 1997), and, therefore the validity and reliability have been concerned, because there is sometimes no equivalent word existing between the different languages. As a solution, only one translator working in the research can maximise the reliability (Twinn, 1997). The interviews were analysed in Chinese and only the results were translated into English, which may reduce the possibilities of misunderstanding.

8.5 Further Research

This research attempts to provide an understanding of the effectiveness of government policies on technology-based SMEs and entrepreneurship. The aims, objectives and research goals are concerned with the technology-based SMEs in Beijing. Through the findings and limitations of the research, the researcher has identified some future directions.

This study can be applied for a comparative study with other cities in China. As the local policies are designed based on the national top-design, there should be not much difference. Thus, the further research can start with a comparison of distinctive points of policies and further compare the disadvantages and policy limitations.

Furthermore, as there is a big gap in examining the entrepreneurship policies in China, the author can distinguish and specify the entrepreneurship policies from SME policies. This can help further research to examine to what extent the

entrepreneurship policies support the implementation of SME policies, as recommended by Shane (2003).

9. References

- Acs, Z. J., & Audretsch, D. B. (1988). Innovation in Large and Small Firms: An Empirical Analysis. *The American Economic Review*, 78(4), 678-690.
- Agrawal, A., & Knoeber, C. R. (2000). Do some outside directors play a political role? Available at SSRN 224133.
- Ahmad, N., & Seymour, R. (2008). Defining entrepreneurial activity: Definitions supporting frameworks for data collection.
- Aldrich, H. E., & Wiedenmayer, G. (1993). From traits to rates: An ecological perspective on organizational foundings. *Advances in entrepreneurship, firm emergence, and growth*, 1, 145-195.
- Almus, M., & Czarnitzki, D. (2003). The effects of public R&D subsidies on firms' innovation activities: the case of Eastern Germany. *Journal of Business & Economic Statistics*, 21(2), 226-236.
- Altenburg, T., & Meyer-Stamer, J. (1999). How to Promote Clusters: Policy Experiences from Latin America. *World Development*, 27(9), 1693-1713.
- Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. *Strategic entrepreneurship journal*, 1(1 - 2), 11-26.
- Andersen, O. (1993). On the internationalization process of firms: a critical analysis. *Journal of International Business Studies*, 209-231.
- Anderson, A. R., & Yiu, E. (2008). From tradition to modern. *Journal of Small Business and Enterprise Development*, 15(4), 775-787.
- Andersson, M., Johansson, B., Karlsson, C., & Löf, H. (2012). *Innovation and Growth: From R&D Strategies of Innovating Firms to Economy-wide Technological Change*: Oxford University Press.
- Audretsch, D. B. (2004). Sustaining Innovation and Growth: Public Policy Support for Entrepreneurship. *Industry and Innovation*, 11(3), 167-191.
- Audretsch, D. B., Grilo, I., & Thurik, A. R. (2007). *Handbook of research on entrepreneurship policy*: Edward Elgar Publishing.
- Autio, E., Sapienza, H. J., & Almeida, J. G. (2000). Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of management journal*, 43(5), 909-924.
- Aversa, G. (2013). Socialist Market Economy. *Associazione Nazionale Enciclopedia della Banca Borsa Working Paper*, 3(1).
- Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2011). Small vs. young firms across the world: contribution to employment, job creation, and growth. *World Bank Policy Research Working Paper*(5631).
- Babcock Gove, P. (1976). *Webster's third new international dictionary of the english language unabridged*: G. & C. Merriam.
- Bacon, N., & Hoque, K. (2005). HRM in the SME sector: valuable employees and coercive networks. *The International Journal of Human Resource Management*, 16(11), 1976-1999.
- Baranano, A. M., Bommer, M., & Jalajas, D. S. (2005). Sources of innovation for high-tech SMEs: a comparison of USA, Canada, and Portugal. *International Journal of Technology Management*, 30(1), 205-219.
- Baregheh, A., Rowley, J., & Sambrook, S. (2009). Towards a multidisciplinary definition of innovation. *Management decision*, 47(8), 1323-1339.
- Baughn, C. C., & Neupert, K. (2003). Culture and National Conditions Facilitating Entrepreneurial Start-ups. *Journal of International Entrepreneurship*, 1(3), 313-330.

- Baumol, W. J. (1968). Entrepreneurship in Economic Theory. *The American Economic Review*, 58(2), 64-71.
- Becher, G., & Weibert, W. (1990). Technologiepolitik in Baden-Württemberg: Mimeo (Karlsruhe: Fraunhofer Institut für Systemtechnik und Innovationsforschung, 1990).
- Beck, T., Demircuc-Kunt, A., & Levine, R. (2005). SMEs, growth, and poverty: cross-country evidence. *Journal of economic growth*, 10(3), 199-229.
- Beebe, B. (2013). Shanzhai, Sumptuary Law, and Intellectual Property Law in Contemporary China. *UCDL Rev.*, 47, 849.
- Bergek, A., & Norrman, C. (2008). Incubator best practice: A framework. *Technovation*, 28(1), 20-28.
- Bessant, J., Lamming, R., Noke, H., & Phillips, W. (2005). Managing innovation beyond the steady state. *Technovation*, 25(12), 1366-1376.
- Best, M. (1998). Cluster dynamics in theory and practice with application to Penang. *UNIDO report*.
- Bhide, A. (2000). *The origin and evolution of new businesses*: Oxford University Press.
- Birch, D. L. (1981). Who creates jobs? *The public interest*(65), 3.
- Blau, G. J. (1987). Using a person-environment fit model to predict job involvement and organizational commitment. *Journal of Vocational Behavior*, 30(3), 240-257.
- Bosma, N., & Wennekers, S. (2004). Entrepreneurial Attitudes Versus Entrepreneurial Activities.
- Bouchard, T. J. (1976). Unobtrusive Measures An Inventory of Uses. *Sociological Methods & Research*, 4(3), 267-300.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative research journal*, 9(2), 27-40.
- Brander, J. A. (1995). Strategic trade policy. *Handbook of international economics*, 3, 1395-1455.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
- Braunerhjelm, P., Acs, Z. J., Audretsch, D. B., & Carlsson, B. (2010). The missing link: knowledge diffusion and entrepreneurship in endogenous growth. *Small Business Economics*, 34(2), 105-125.
- Bridge, S., O'Neill, K., & Cromie, S. (1998). Understanding enterprise, entrepreneurship and small firms: London: Macmillan.
- Bruton, G. D., & Ahlstrom, D. (2003). An institutional view of China's venture capital industry: Explaining the differences between China and the West. *Journal of Business Venturing*, 18(2), 233-259.
- Bruton, G. D., Lan, H., & Lu, Y. (2000). China's township and village enterprises: Kelon's competitive edge. *The Academy of Management Executive*, 14(1), 19-27.
- Bryman, A., & Cramer, D. (2005). *Quantitative data analysis with SPSS 12 and 13: a guide for social scientists*: Psychology Press.
- Btirgel, O., Fier, A., Licht, G., & Murray, G. (2004). The internationalisation of young high-tech firms. *ZEW Economic Studies*, 22.
- Burrell, G., & Morgan, G. (1979). *Sociological paradigms and organisational analysis* (Vol. 248): london: Heinemann.
- Busom*, I. (2000). An empirical evaluation of the effects of R&D subsidies. *Economics of innovation and new technology*, 9(2), 111-148.
- Butchart, R. (1987). A new UK definition of high-technology industries. *Economic Trends*, 400, 82-88.

- Carlisle, E., & Flynn, D. (2005). Small business survival in China: Guanxi, legitimacy, and social capital. *Journal of Developmental Entrepreneurship*, 10(01), 79-96.
- Carpenter, R. E., & Petersen, B. C. (2002). Capital market imperfections, high-tech, and new equity financing. *The Economic Journal*, 112(477), F54-F72.
- Carson, D., Cromie, S., McGowan, P., & Hill, J. (1995). *Marketing and entrepreneurship in SMEs: an innovative approach* (Vol. 1): Prentice Hall London.
- Casey, J., & Koleski, K. (2011). *Backgrounder: China's 12th five-year plan*: US-China Economic and Security Review Commission.
- Casson, M. (1982). *The entrepreneur: An economic theory*: Rowman & Littlefield.
- Casson, M. (1995). *Entrepreneurship and business culture*: E. Elgar.
- Ceglie, G., & Dini, M. (1999). *SME cluster and network development in developing countries: the experience of UNIDO*: UNIDO.
- Charney, A., & Libecap, G. (2000). *Impact of entrepreneurship education*: Kauffman Center for Entrepreneurial Leadership Kansas City.
- Chen, D., & Karami, A. (2010). Critical success factors for inter-firm technological cooperation: an empirical study of high-tech SMEs in China. *International Journal of Technology Management*, 51(2-4), 282-299.
- Chen, J. (2006). Development of Chinese small and medium-sized enterprises. *Journal of Small Business and Enterprise Development*, 13(2), 140-147.
- Chrisman, J. J., & Katrishen, F. (1995). The Small Business Development Center programme in the USA: a statistical analysis of its impact on economic development. *Entrepreneurship & Regional Development*, 7(2), 143-155.
- Coad, A., Cowling, M., Nightingale, P., Pellegrino, G., Savona, M., & Siepel, M. (2014). *UK innovation survey: highly innovative firms and growth*: Department for Business, Innovation & Skills.
- Coad, A., & Rao, R. (2008). Innovation and firm growth in high-tech sectors: A quantile regression approach. *Research Policy*, 37(4), 633-648.
- Coad, A., & Reid, A. (2012). *The Role of Technology and Technology-Based Firms for Economic Growth*. Technopolis Brighton.
- Cohen, W. M. (2010). Chapter 4 - Fifty Years of Empirical Studies of Innovative Activity and Performance. In H. H. Bronwyn & R. Nathan (Eds.), *Handbook of the Economics of Innovation* (Vol. Volume 1, pp. 129-213): North-Holland.
- Cohen, W. M., & Klepper, S. (1992). The anatomy of industry R&D intensity distributions. *The American Economic Review*, 773-799.
- Cohen, W. M., & Levinthal, D. A. (1989). Innovation and learning: the two faces of R & D. *The Economic Journal*, 99(397), 569-596.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative science quarterly*, 128-152.
- Coles, T., Duval, D. T., & Shaw, G. (2012). *Student's guide to writing dissertations and theses in tourism studies and related disciplines*: Routledge.
- Collis, D. J. (1991). A resource-based analysis of global competition: The case of the bearings industry. *Strategic Management Journal*, 12(S1), 49-68.
- Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory*: Sage.
- Cosh, A., & Hughes, A. (1994). *Size, financial structure and profitability: UK companies in the 1980s*: Routledge.
- Coviello, N. E., & McAuley, A. (1999). Internationalisation and the Smaller Firm: A Review of Contemporary Empirical Research. *MIR: Management International Review*, 39(3), 223-256.

- Cowling, M. (1998). Regional determinants of small firm loans under the UK loan guarantee scheme. *Small Business Economics*, 11(2), 155-167.
- Cowling, M., & Mitchell, P. (1997). The Evolution of UK Self - Employment: A Study of Government Policy and the Role of the Macroeconomy. *The Manchester School*, 65(4), 427-442.
- Cressy, R. (1996). Are business startups debt-rationed? *The Economic Journal*, 1253-1270.
- Cressy, R., & Olofsson, C. (1997). European SME Financing: An Overview. *Small Business Economics*, 9(2), 87-96.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches*: SAGE Publications, Incorporated.
- Creswell, J. W. (2007). *Qualitative inquiry & research design: Choosing among five approaches*: Thousand Oaks, CA.: Sage Publications.
- Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*: Sage.
- Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced mixed methods research designs. *Handbook of mixed methods in social and behavioral research*, 209-240.
- Cunningham, J. B., & Lischeron, J. (1991). Defining entrepreneurship. *Journal of Small Business Management*, 29(1), 45-61.
- Czarnitzki, D., Hanel, P., & Rosa, J. M. (2011). Evaluating the impact of R&D tax credits on innovation: A microeconomic study on Canadian firms. *Research Policy*, 40(2), 217-229.
- Czarnitzki, D., & Hussinger, K. (2004). The link between R&D subsidies, R&D spending and technological performance: ZEW Discussion Papers.
- Daily, C. (2013). Marketization the key to economic system reform: interpretation of the Third Plenary Session of the 18th CPC Central Committee. *November, 18, 2015-2004*.
- Dana, L. P. (2001). The education and training of entrepreneurs in Asia. *Education+ Training*, 43(8/9), 405-416.
- David, P. A., Hall, B. H., & Toole, A. A. (2000). Is public R&D a complement or substitute for private R&D? A review of the econometric evidence. *Research Policy*, 29(4-5), 497-529.
- Denzin, N. K. (1970). *The research act: A theoretical introduction to sociological methods*: Transaction publishers.
- Denzin, N. K., & Lincoln, Y. S. (2008). *Collecting and interpreting qualitative materials* (Vol. 3): Sage.
- Dewenter, K. L., & Malatesta, P. H. (2001). State-Owned and Privately Owned Firms: An Empirical Analysis of Profitability, Leverage, and Labor Intensity. *The American Economic Review*, 91(1), 320-334.
- Dimitri Gagliardi, P. M., Edward Glossop, Cecilia Caliandro, Michael Fritsch, Gabriela , & Brtkova, N. U. B., Demetrius Klitou, Gavriel Avigdor, Chiara Marzocchi, Ronnie Ramlogan. (2013). A Recovery on The Horizon: Annual Report on European SMEs 2012/2013. In D. G. Deborah Cox, Erica Monfardini, Sebastien Cuvelier, David Vidal, Begoña Laibarra, & A. S. Laurent Probst, Anselm Mattes (Eds.), *Annual Report on European SMEs*. European Commission.
- Dosi, G. (1988). Sources, procedures, and microeconomic effects of innovation. *Journal of economic Literature*, 1120-1171.
- Drucker, P. F. (1985). *Innovative and Entrepreneurship, Practice and Principles*. *New York: Harper & Row*. Retrieved April, 7, 2013.
- Drucker, P. F. (1993). *Post-capitalist society*. Routledge.

- Easterby-Smith, M., Thorpe, R., & Jackson, P. (2012). *Management research*: Sage Publications.
- Eul, F. (1985). Science parks and innovation centres—property, the unconsidered element. *Science Parks and Innovation Centres: Their Economic and Social Impact*, Amsterdam: Elsevier.
- Fan, G., & Woo, W. T. (2005). “Sequencing” or “Parallel Partial Progression”: Incoherence Cost and the Optimal Path of Institutional Transformation [J]. *Economic Research Journal*, 1.
- Fillis, I. (2001). Small firm internationalisation: an investigative survey and future research directions. *Management decision*, 39(9), 767-783.
- Fillis, I., & McAuley, A. (2000). Modeling and measuring creativity at the interface. *Journal of Marketing Theory and Practice*, 8-17.
- Fillis, I. R. (1999). An examination of the internationalisation process of the smaller craft firm in the United Kingdom and the Republic of Ireland.
- Finn, M., Walton, M., & Elliott-White, M. (2000). *Tourism and leisure research methods: Data collection, analysis, and interpretation*: Pearson education.
- Fox, N. (2006). Using interviews in a research project. Retrieved July, 7, 2008.
- Francis, D., & Bessant, J. (2005). Targeting innovation and implications for capability development. *Technovation*, 25(3), 171-183.
- Fruin, W. M., & Kaisha, T. K. K. (1997). *Knowledge works: Managing intellectual capital at Toshiba*: Oxford University Press New York.
- Fukugawa, N. (2006). Science parks in Japan and their value-added contributions to new technology-based firms. *International Journal of Industrial Organization*, 24(2), 381-400.
- Funk, I., & Wagnalls, A. (1968). *Standard college dictionary*: New York, Harcourt, Brace & World, Inc. New.
- Gaglio, C. M., & Katz, J. A. (2001). The psychological basis of opportunity identification: Entrepreneurial alertness. *Small Business Economics*, 16(2), 95-111.
- Garfield, C. (1987). *Peak performers*: Harper Collins.
- Gartner, W. B. (1985). A conceptual framework for describing the phenomenon of new venture creation. *Academy of Management Review*, 10(4), 696-706.
- Glickman, N. J., & Woodward, D. P. (1989). *The new competitors: How foreign investors are changing the US economy*: Basic Books, Incorporated.
- Gnyawali, D. R., & Fogel, D. S. (1994). Environments for entrepreneurship development: key dimensions and research implications. *Entrepreneurship Theory and Practice*, 18, 43-43.
- Government. (2009). *Interim regulations to attract overseas talents to work or start businesses in Beijing*. Beijing: People's Government of Beijing Municipality.
- Government. (2011). *Interim regulations to cultivate talents*. Beijing: People's Government of Beijing Municipality.
- Griliches, Z. (1986). Productivity, R&D, and basic research at the firm level in the 1970s: National Bureau of Economic Research Cambridge, Mass., USA.
- Guo, C., & Miller, J. K. (2010). Guanxi Dynamics and Entrepreneurial Firm Creation and Development in China. *Management and Organization Review*, 6(2), 267-291.
- Haaland, J. I., & Kind, H. J. (2008). R&D policies, trade and process innovation. *Journal of International Economics*, 74(1), 170-187.
- Hall, B., & Van Reenen, J. (2000). How effective are fiscal incentives for R&D? A review of the evidence. *Research Policy*, 29(4-5), 449-469.

- Hall, B. H. (2002). The financing of research and development. *Oxford review of economic policy*, 18(1), 35-51.
- Hall, B. H., Lotti, F., & Mairesse, J. (2009). Innovation and productivity in SMEs: empirical evidence for Italy. *Small Business Economics*, 33(1), 13-33.
- Hall, B. H., & Mairesse, J. (1995). Exploring the relationship between R&D and productivity in French manufacturing firms. *Journal of econometrics*, 65(1), 263-293.
- Hamilton, G. G. (1996). Competition and organization: a reexamination of Chinese business practices.
- Harter, D. E., Krishnan, M. S., & Slaughter, S. A. (2000). Effects of Process Maturity on Quality, Cycle Time, and Effort in Software Product Development. *Management Science*, 46(4), 451-466.
- Harvie, C., & Lee, B. (2002). *The role of SMEs in national economies in East Asia* (Vol. 2): Edward Elgar Publishing.
- Hayek, F. A. (1945). The use of knowledge in society. *The American Economic Review*, 519-530.
- Haynes, W. (2013). Student's t-Test *Encyclopedia of Systems Biology* (pp. 2023-2025): Springer.
- Heilmann, S. (2008). From Local Experiments to National Policy: The Origins of China's Distinctive Policy Process. *The China Journal*(59), 1-30.
- Henrekson, M., & Johansson, D. (2010). Gazelles as job creators: a survey and interpretation of the evidence. *Small Business Economics*, 35(2), 227-244.
- Hisrich, R. D. (2012). *International entrepreneurship: starting, developing, and managing a global venture*: Sage.
- Hoffman, K., Parejo, M., Bessant, J., & Perren, L. (1998). Small firms, R&D, technology and innovation in the UK: a literature review. *Technovation*, 18(1), 39-55.
- Holliday, R. (1995). *Investigating small firms: Nice work? : Cengage Learning Emea*.
- Holmes, T. J., & Schmitz Jr, J. A. (2001). Competition at work: Railroads vs. monopoly in the US shipping industry. *Federal Reserve Bank of Minneapolis Quarterly Review*, 25(2), 3-29.
- Hsiung, J. C. (2003). The aftermath of China's accession to the World Trade Organization. *INDEPENDENT REVIEW-OAKLAND-*, 8(1), 87-112.
- Huang, C., Amorim, C., Spinoglio, M., Gouveia, B., & Medina, A. (2004). Organization, programme and structure: an analysis of the Chinese innovation policy framework. *R&D Management*, 34(4), 367-387.
- Huggins, R., & Williams, N. (2009). Enterprise and public policy: a review of Labour government intervention in the United Kingdom. *Environment and planning. C, Government & policy*, 27(1), 19.
- Humphrey, J., & Schmitz, H. (1995). *Principles for promoting clusters & networks of SMEs* (Vol. 1): UNIDO.
- Hyytinen, A., & Toivanen, O. (2005). Do financial constraints hold back innovation and growth?: Evidence on the role of public policy. *Research Policy*, 34(9), 1385-1403.
- Jacobson, R. (1992). The "Austrian" school of strategy. *Academy of Management Review*, 17(4), 782-807.
- Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative science quarterly*, 602-611.
- Johannessen, A., Olsen, B., & Olaisen, J. (1999). Aspects of innovation theory based on knowledge-management. *International Journal of Information Management*, 19(2), 121-139.

- Johanson, J., & Mattsson, L.-G. (1988). Internationalization in industrial systems-a network approach. *Strategies*, 287-314.
- Johanson, J., & Vahlne, J. E. (1990). The Mechanism of Internationalisation. *International Marketing Review*, 7(4), null.
- Johnson, P., & Clark, M. (2006). *Business and management research methodologies*: Sage.
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of mixed methods research*, 1(2), 112-133.
- Jones, O., & Tilley, F. (2007). *Competitive advantage in SMEs: organising for innovation and change*: Wiley. com.
- Kao, R. W. (1989). *Entrepreneurship and enterprise development*: Holt, Rinehart & Winston of Canada.
- Keeble, D., & Nachum, L. (2002). Why Do Business Service Firms Cluster? Small Consultancies, Clustering and Decentralization in London and Southern England. *Transactions of the Institute of British Geographers*, 27(1), 67-90.
- Kirzner, I. M. (1997). Entrepreneurial discovery and the competitive market process: An Austrian approach. *Journal of economic Literature*, 60-85.
- Kirzner, M. (1973). *Competition and entrepreneurship*: University of Chicago Press.
- Knight, F. (1921). Risk, uncertainty, and profit. *КНИГА*.
- Knight, G. A., & Cavusgil, S. T. (2004). Innovation, organizational capabilities, and the born-global firm. *Journal of International Business Studies*, 35(2), 124-141.
- Koberg, C. S., Detienne, D. R., & Heppard, K. A. (2003). An empirical test of environmental, organizational, and process factors affecting incremental and radical innovation. *The Journal of High Technology Management Research*, 14(1), 21-45.
- Kohers, N., & Kohers, T. (2000). The value creation potential of high-tech mergers. *Financial Analysts Journal*, 40-50.
- Kommission, E. (2005). *The new SME definition: User guide and model declaration*: European Comm., Publication Office.
- Kongolo, M. (2010). Job creation versus job shedding and the role of SMEs in economic development. *African Journal of Business Management*, 4(11), 2288-2295.
- Krasniqi, B. A. (2007). Barriers to entrepreneurship and SME growth in transition: the case of Kosova. *Journal of Developmental Entrepreneurship*, 12(01), 71-94.
- Kristensen, P. H. (1992). Industrial districts in West Jutland, Denmark. *Industrial Districts and Local Economic Regeneration. International Institute for Labour Studies, ILO, Geneva*.
- Kvale, S., & Brinkmann, S. (2009). *Interviews: Learning the craft of qualitative research interviewing*: Sage.
- Lawrence, S., & Martin, M. F. (2012). *Understanding China's political system*: Congressional Research Service.
- Lee, S. M., & Peterson, S. J. (2000). Culture, entrepreneurial orientation, and global competitiveness. *Journal of World Business*, 35(4), 401-416.
- Lerner, J. (1996). *The government as venture capitalist: The long-run effects of the SBIR program*: National Bureau of Economic Research.

- Lewin, A. Y., & Massini, S. (2003). Knowledge creation and organizational capabilities of innovating and imitating firms. *Organizations as knowledge systems*, 209-237.
- Lewis, J. (2011). Energy and climate goals of China's 12th five-year plan. *Center for Climate and Energy Solutions*.
- Leyden, D. P., Link, A. N., & Siegel, D. S. (2008). A Theoretical and Empirical Analysis of the Decision to Locate on a University Research Park. *IEEE Transactions on Engineering Management*, 55(1), 23-28.
- Link, A., & Scott, J. (2006). US university research parks. *Journal of Productivity Analysis*, 25(1-2), 43-55.
- Link, A., & Siegel, D. (2007). *Innovation, entrepreneurship, and technological change*: Oxford University Press on Demand.
- Liu, F., Simon, D. F., Sun, Y., & Cao, C. (2011). China's innovation policies: Evolution, institutional structure, and trajectory. *Research Policy*, 40(7), 917-931.
- Liu, J., & Diamond, J. (2005). China's environment in a globalizing world. *Nature*, 435(7046), 1179-1186.
- Liu, X. (2007). SME development in China: A policy perspective on SME industrial clustering. *Asian SMEs and Globalization*, ERIA Research Project Report(5).
- Lukács, E. (2005). The economic role of SMEs in world economy, especially in Europe. *European Integration Studies*(1 (4), 3-12.
- Lundström, A., & Stevenson, L. (2005). *Entrepreneurship policy: Theory and practice* (Vol. 9): Springer.
- Macdonald, S., Assimakopoulos, D., & Anderson, P. (2007). Education and Training for Innovation in SMEs A Tale of Exploitation. *International small business journal*, 25(1), 77-95.
- Marshall, A. (2006). *Industry and trade* (Vol. 2): Cosimo, Inc.
- Marshall, M. N. (1996). Sampling for qualitative research. *Family practice*, 13(6), 522-526.
- Massey, D., Quintas, P., & Wield, D. (1992). High tech fantasies. *Science Parks in Society Science*.
- McClelland, D. C. (1967). *Achieving society*: Simon and Schuster.
- McClelland, D. C., & Winter, D. G. (1969). Motivating economic achievement.
- McDougall, P. P., & Oviatt, B. M. (1991). *Global start-ups: New ventures without geographic limits*. Paper presented at the The Entrepreneurship Forum.
- Mian, A. R., & Khwaja, A. I. (2004). Do lenders favor politically connected firms? Rent provision in an emerging financial market. *Rent Provision in an Emerging Financial Market (December 2004)*.
- Michaelas, N., Chittenden, F., & Poutziouris, P. (1999). Financial policy and capital structure choice in UK SMEs: Empirical evidence from company panel data. *Small Business Economics*, 12(2), 113-130.
- Mill, J. S. (1848). *Principles of political economy with some of their applications to social philosophy*, by John Stuart Mill: JW Parker.
- Modigliani, F., & Cohn, R. A. (1979). Inflation, rational valuation and the market. *Financial Analysts Journal*, 24-44.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 261-297.
- Moen, O., & Servais, P. (2002). Born global or gradual global? Examining the export behavior of small and medium-sized enterprises. *Journal of International Marketing*, 10(3), 49-72.

- Montinola, G., Qian, Y., & Weingast, B. R. (1995). Federalism, Chinese style: the political basis for economic success in China. *World politics*, 48(01), 50-81.
- Morrison, A. (2000). Entrepreneurship: what triggers it? *International Journal of Entrepreneurial Behavior & Research*, 6(2), 59-71.
- Morse, J. M. (1991). Approaches to qualitative-quantitative methodological triangulation. *Nursing research*, 40(2), 120-123.
- MOST. (2008). *the Administrative Measures for Determination of High and New Tech Enterprises* Beijing: the Ministry of Science and Technology and Ministry of Finance and State Administration of Taxation
- MOST. (2011a). *A Long-term Plan for the Development of Scientific and Technology Talents* ' Beijing: the Ministry of Science and Technology
- MOST. (2011b). *Some Suggestions to promote the development of innovation in technology-based SMEs*. Beijing: the Ministry of Science and Technology
- Muent, H., Pissarides, F., & Sanfey, P. (2001). Taxes, competition and finance for Albanian enterprises: evidence from a field study. *MOST: Economic Policy in Transitional Economies*, 11(3), 239-251.
- Nadiri, M. I., & Mamuneas, T. P. (1994). The effects of public infrastructure and R&D capital on the cost structure and performance of US manufacturing industries: National Bureau of Economic Research.
- Nadvi, K. (1995). *Industrial clusters and networks: Case studies of SME growth and innovation*: United Nations Industrial Development Organization.
- Nallari, R., & Griffith, B. (2011). *Understanding growth and poverty: theory, policy, and empirics*: World Bank Publications.
- NBSC. (2015). China Development Indicators. Retrieved 07/047/2015, from National Bureau of Statistics of China <http://www.stats.gov.cn/english/>
- NDRC. (2010). *China's Twelfth Five Year Plan* Beijing: National Development and Reform Commission.
- Neary, J. P., & Leahy, D. (2000). Strategic trade and industrial policy towards dynamic oligopolies. *The Economic Journal*, 110(463), 484-508.
- NESTA. (2009). The Vital 6%: How high-growth innovative businesses generate prosperity and jobs. *NESTA Making Innovation Flourish*. Retrieved from NESTA website: <http://www.nesta.org.uk/sites/default/files/vital-six-percent.pdf>
- Nicolaou, N., Shane, S., Cherkas, L., Hunkin, J., & Spector, T. D. (2008). Is the Tendency to Engage in Entrepreneurship Genetic? *Management Science*, 54(1), 167-179.
- Noaks, L., & Wincup, E. (2004). *Criminological research: Understanding qualitative methods*: Sage.
- Nooteboom, B. (1988). The Facts About Small Business and the Real Values of Its 'Life World': A Social Philosophical Interpretation of This Sector of the Modern Economy. *American journal of economics and sociology*, 47(3), 299-314.
- Nooteboom, B. (1994). Innovation and diffusion in small firms: theory and evidence. *Small Business Economics*, 6(5), 327-347.
- Nooteboom, B., & Groningen, R. (1993). *Schumpeterian and Austrian entrepreneurship: a unified process of innovation and diffusion*: Faculteit Bedrijfskunde, Rijksuniversiteit Groningen.
- North, D., Smallbone, D., & Wickers, I. (2001). Public Sector Support for Innovating SMEs. *Small Business Economics*, 16(4), 303-317.
- North, D. C. (1981). *Structure and change in economic history*: Norton.

- O'Connor, A. (2013). A conceptual framework for entrepreneurship education policy: Meeting government and economic purposes. *Journal of Business Venturing*, 28(4), 546-563.
- Oberschachtsiek, D., & Scioch, P. (2011). The outcome of coaching and training for self-employment: A statistical evaluation of non-financial support schemes for unemployment business founders in Germany: IAB discussion paper.
- OECD. (2006). Economic Survey of China, 2005 Retrieved 25/11/14, 2014, from <http://homepage.ntu.edu.tw/~lbh/ref/OECD/42.pdf>
- OECD. (2008). *OECD Reviews of Innovation Policy China*: Organisation for Economic Co-operation and Development.
- OECD. (2009). Top Barriers and Drivers to SME Internationalisation *Report by the OECD Working Party on SMEs and Entrepreneurship*.
- OECD. (2011). *OECD Science, Technology and Industry Scoreboard 2011*: OECD Publishing.
- OECD. (2012). China in Focus: Lessons and Challenges. Retrieved from <http://www.oecd.org/china>, <http://www.oecdchina.org>
- OECD. (2013). OECD Economic Surveys: China 2013. Retrieved from <http://www.oecd-ilibrary.org/docserver/download/1013051e.pdf?expires=1381323553&id=id&accname=ocid45123513a&checksum=B3C10B18C1D9194F7DA8AE E3E24AE57C>
- Oh, I., Lee, J.-D., Heshmati, A., & Choi, G.-G. (2009). Evaluation of Credit Guarantee Policy Using Propensity Score Matching. *Small Business Economics*, 33(3), 335-351.
- Ojala, A., & Tyrväinen, P. (2007). Entry barriers of small and medium - sized software firms in the Japanese market. *Thunderbird International Business Review*, 49(6), 689-705.
- Oslo, M. (2005). Guidelines for collecting and interpreting innovation data: Paris: OECD Publishing.
- Outcalt, C. (2000). The notion of entrepreneurship: Historical and emerging issues. *CELCEE Kauffman Center for Entrepreneurial Leadership working paper*.
- Oviatt, B. M., & McDougall, P. P. (1994). Toward a theory of international new ventures. *Journal of International Business Studies*, 45-64.
- Oviatt, B. M., McDougall, P. P., Simon, M., & Shrader, R. C. (1993). Heartware International Corporation: A Medical Equipment Company" Born International" Part A. *Entrepreneurship Theory and Practice*, 18, 111-111.
- Pallant, J., & Manual, S. S. (2007). A step by step guide to data analysis using SPSS for windows version 15: Open University Press, Milton Keynes, UK.
- Parrilli, M. D. (2007). SME Cluster Development.
- Pettit, R. R., & Singer, R. F. (1985). Small business finance: a research agenda. *Financial management*, 47-60.
- Phillips McDougall, P., Shane, S., & Oviatt, B. M. (1994). Explaining the formation of international new ventures: The limits of theories from international business research. *Journal of Business Venturing*, 9(6), 469-487.
- Porter, M. E. (1993). *The competitive advantage of nations*: Harvard Business School Management Programs.
- Pyke, F. (1992). *Industrial development through small-firm cooperation: theory and practice*: International Labour Organization.

- Qian, G., & Li, L. (2003). Profitability of small - and medium - sized enterprises in high - tech industries: the case of the biotechnology industry. *Strategic Management Journal*, 24(9), 881-887.
- Quinn, J. B., Anderson, P., & Finkelstein, S. (1996). Leveraging intellect. *The Academy of Management Executive*, 10(3), 7-27.
- Quinn, J. B., Anderson, P., & Finkelstein, S. (2005). Leveraging Intellect. *The Academy of Management Executive (1993-2005)*, 19(4), 78-94.
- Rauch, A., & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *European Journal of Work and Organizational Psychology*, 16(4), 353-385.
- Ray, D. M. (1989). *Entrepreneurial companies "born" international: Four case studies*. Paper presented at the Babson Entrepreneurship Research Conference on Entrepreneurship, St. Louis.
- Rennie, M. W. (1993). Born global. *McKinsey Quarterly*, 45-45.
- Reynolds, P. D., Camp, S., Bygrave, W., Autio, E., & Hay, M. (2002). Global entrepreneurship monitor gem 2001 summary report. *London Business School and Babson College*.
- Roberts, I., Sawbridge, D., Bamber, G. (1992). *Employee relations in small firms* (3rd edn. ed.). London: Kogan Page.
- Robson, C. (2002). Real World Research. 2nd. Edition. *Blackwell Publishing. Malden*.
- Robson, P. J., & Bennett, R. J. (2000). SME growth: the relationship with business advice and external collaboration. *Small Business Economics*, 15(3), 193-208.
- Roehrig, C. (1988). Conditions for identification in nonparametric and parametric models. *Econometrica: Journal of the Econometric Society*, 433-447.
- Rogers, E. M. (1983). *Diffusion of innovations*: Simon and Schuster.
- Roscoe, J. (1973). Can Entrepreneurship Be Taught? *MBA Magazine*, June-July.
- Rosenberg, N. (1990). Why do firms do basic research (with their own money)? *Research Policy*, 19(2), 165-174.
- Rubin, A., & Babbie, E. (2015). *Empowerment series: Essential research methods for social work*: Cengage Learning.
- Ryan, G. W., & Bernard, H. R. (2000). Data management and analysis methods.
- Saich, T. (2001). The Changing Role of the State in Reform China. *Kennedy School of*.
- Saunders, M. N., Saunders, M., Lewis, P., & Thornhill, A. (2011). *Research methods for business students, 5/e*: Pearson Education India.
- Schmitz, H. (1992). On the clustering of small firms. *IDS bulletin*, 23(3), 64-69.
- Schmitz, H., & Musyck, B. (1994). Industrial districts in Europe: policy lessons for developing countries? *World Development*, 22(6), 889-910.
- Schöllhammer, H., & Kuriloff, A. H. (1979). *Entrepreneurship and small business management*: Wiley New York.
- Schreyer, P. (1996). SMEs and employment creation: Overview of selected quantitative studies in OECD member countries: OECD Publishing.
- Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle* (Vol. 55): Transaction Publishers.
- Segerstrom, P. S. (2000). The long-run growth effects of R&D subsidies. *Journal of economic growth*, 5(3), 277-305.
- Shane, S. (1996). Explaining variation in rates of entrepreneurship in the United States: 1899-1988. *Journal of Management*, 22(5), 747-781.

- Shane, S. (2000). Prior Knowledge and the Discovery of Entrepreneurial Opportunities. *Organization Science*, 11(4), 448-469.
- Shane, S. (2003). *A general theory of entrepreneurship: The individual-opportunity nexus*: Edward Elgar Publishing.
- Shane, S., & Venkataraman, S. (2000). The Promise of Entrepreneurship as a Field of Research. *Academy of Management Review*, 25(1), 217-226.
- Shefer, D., & Frenkel, A. (2005). R&D, firm size and innovation: an empirical analysis. *Technovation*, 25(1), 25-32.
- Shuman, J. C., & Seeger, J. A. (1986). The theory and practice of strategic management in smaller rapid growth firms. *American Journal of Small Business*, 11(1), 7-18.
- Signorini, L. F. (1994). The price of Prato, or measuring the industrial district effect. *Papers in Regional Science*, 73(4), 369-392.
- Solow, R. M. (1997). *Learning from" learning by doing": lessons for economic growth*: Stanford University Press.
- Stam, E., & Wennberg, K. (2009). The Roles of R & D in New Firm Growth. *Small Business Economics*, 33(1), 77-89.
- StateCouncil. (2014a). the Government Departments Retrieved 22/01/2014, 2014, from <http://www.gov.cn/guowuyuan/>
- StateCouncil. (2014b). *Some suggestions for accelerating the development of science and technology service industry*. Beijing: StateCouncil.
- StateCouncil. (2014c). *Some suggestions for improvement and strengthening scientific research projects and fund management of central financial institution*. Beijing: StateCouncil.
- Stein, J. M. (1989). *The random house college dictionary*: Random House Inc.
- Stevenson, L., & Lundström, A. (2001). *Patterns and trends in entrepreneurship/SME policy and practice in ten economies* (Vol. 3): Elanders Gotab.
- Stiglitz, J. E. (1993). Incentives, Organizational Structures, and Contractual Choice in the Reform of Socialist Agriculture. *The Agricultural Transition in Central and European Europe and the Former USSR, Washington DC: The World Bank*, 27-46.
- Storey, D. J. (1982). *Entrepreneurship and the new firm*: Croom Helm London.
- Storey, D. J. (1994). Understanding the small business sector. *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.
- Storey, D. J. (2005). Entrepreneurship, small and medium sized enterprises and public policies *Handbook of entrepreneurship research* (pp. 473-511): Springer.
- Sveiby, K. E. (1997). *The new organizational wealth: Managing & measuring knowledge-based assets*: Berrett-Koehler Publishers.
- Sveiby, K. E. (1997). The new organizational wealth: Managing and measuring knowledge-based assets. *San Francisco: Barrett-Koehler*.
- Swinnen, J. F., & Gow, H. R. (1999). Agricultural credit problems and policies during the transition to a market economy in Central and Eastern Europe. *Food Policy*, 24(1), 21-47.
- Tambunan, T. (2008). SME development, economic growth, and government intervention in a developing country: The Indonesian story. *Journal of International Entrepreneurship*, 6(4), 147-167.
- Temple, B., & Young, A. (2004). Qualitative research and translation dilemmas. *Qualitative research*, 4(2), 161-178.

- TheWorldBank. (2014). China Development Indicators. Retrieved 10/07/2014, from The World Bank <http://databank.worldbank.org/data/reports.aspx?source=2&country=CHN&series=&period=>
- Thurow, L. C. (1996). *The future of capitalism: How today's economic forces shape tomorrow's world*: Nicholas Brealey London.
- Twinn, S. (1997). An exploratory study examining the influence of translation on the validity and reliability of qualitative data in nursing research. *Journal of Advanced Nursing*, 26(2), 418-423.
- USITC.gov (2010). [Small and Medium-Sized Enterprises: Overview of Participation in US Exports].
- USTR. (2013). 2013 Special 301 Report. United States.
- Van Praag, M., & Versloot, P. (2008). The economic benefits and costs of entrepreneurship: A review of the research. *Foundations and Trends in Entrepreneurship*, 4(2), 65-154.
- Varum, C. A., & Rocha, V. C. (2013). Employment and SMEs during crises. *Small Business Economics*, 40(1), 9-25.
- Venkataraman, S. (1997). The distinctive domain of entrepreneurship research. *Advances in entrepreneurship, firm emergence and growth*, 3(1), 119-138.
- Webb, E. J., Campbell, D. T., Schwartz, R. D., & Sechrest, L. (1966). *Unobtrusive measures: Nonreactive research in the social sciences* (Vol. 111): Rand McNally Chicago.
- Webb, E. J., Campbell, D. T., Schwartz, R. D., & Sechrest, L. (1999). *Unobtrusive measures* (Vol. 2): Sage Publications.
- Wennekers, S., van Wennekers, A., Thurik, R., & Reynolds, P. (2005). Nascent Entrepreneurship and the Level of Economic Development. *Small Business Economics*, 24(3), 293-309.
- Westhead, P., & Batstone, S. (1998). Independent technology-based firms: the perceived benefits of a science park location. *Urban Studies*, 35(12), 2197-2219.
- Wheeler, D., Wang, H., & Dasgupta, S. (2003). Can China grow and safeguard its environment? The case of industrial pollution. *How far across the river?: Chinese policy reform at the millennium*, 353.
- Wilkinson, A. (1999). Employment relations in SMEs. *Employee relations*, 21(3), 206-217.
- Winter, S. G., & Nelson, R. R. (1982). An evolutionary theory of economic change. *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.
- WorldBank. (2014). GDP Growth (annual %). from The World Bank <http://databank.worldbank.org/data/reports.aspx?source=2&country=CHN&series=&period=>
- WorldBank. (2015). The Total Tax Rate (% of commercial profits) Retrieved 29/10/2015, from <http://databank.worldbank.org/data/reports.aspx?source=2&country=CHN&series=&period=#>
- Wright, M., Hmieleski, K. M., Siegel, D. S., & Ensley, M. D. (2007). The role of human capital in technological entrepreneurship. *Entrepreneurship Theory and Practice*, 31(6), 791-806.
- www.sme.gov.cn. (2013).
- Xu, C. (2011). The fundamental institutions of China's reforms and development. *Journal of economic Literature*, 1076-1151.

- Yang, C., Motohashi, K., & Chen, J. (2009). Are new technology-based firms located on science parks really more innovative?: Evidence from Taiwan. *Research Policy*, 38(1), 77-85.
- Yang, M. (1994). *Gifts, favors, and banquets: The art of social relationships in China*: Cornell University Press.
- Yin, R. K. (2014). *Case study research: Design and methods*: Sage publications.
- Yu, T. (1997). Entrepreneurial state: the role of government in the economic development of the Asian newly industrialising economies. *Development Policy Review*, 15(1), 47-64.
- Zahra, S. A., & Covin, J. G. (1994). The financial implications of fit between competitive strategy and innovation types and sources. *The Journal of High Technology Management Research*, 5(2), 183-211.
- Zecchini, S., & Ventura, M. (2009). The Impact of Public Guarantees on Credit to SMEs. *Small Business Economics*, 32(2), 191-206.
- Zhang, C. (2009). *Promoting enterprise-led innovation in China*: World Bank-free PDF.
- Zhongguancun. (2007). Zhongguancun Science Park: 20th Anniversary Development Retrospect Retrieved 15/04, 2015, from www.zgc.gov.cn/document/20100608161241000603.pdf
- Zhongguancun. (2010). *1+6 Policies*. Beijing: Zhongguancun Science Park Retrieved from http://www.zhongguancun.com.cn/cyzc/zcid/201311/t20131127_578588.htm.
- Zhongguancun. (2013). *Supportive fund management regulations for talents cultivation* Beijing: Zhongguancun.
- Zhou, Y., & Xin, T. (2003). An Innovative Region in China: Interaction between Multinational Corporations and Local Firms in a High-Tech Cluster in Beijing. *Economic Geography*, 79(2), 129-152.
- Zirger, B. J., & Hartley, J. L. (1996). The effect of acceleration techniques on product development time. *Engineering Management, IEEE Transactions on*, 43(2), 143-152.

10. Appendices

10.1 Appendix 1: Ethical Approval Form

University of Exeter Business School
Ethical Approval Form: Research Students

Please refer to 'Guidance for completing Business School ethics form' when completing the form.

This form is to be completed by the research student. When completing the form be mindful that the purpose of the document is to clearly explain the **ethical considerations** of the research being undertaken.

Once completed, please submit the form **electronically and a signed hard copy** to Helen Bell at H.E.Bell@exeter.ac.uk. A copy of your approved Research Ethics Application Form together with accompanying documentation **must be bound into your PhD thesis**.

Part A: Background

Student name	MEIYING CHEN		
Supervisors names	MARC COWLING		
Title of thesis	Effects of Government Interventions on Chinese High-tech SMEs		
Date of entry	24/Sep/2012	Status	FT
Start and estimated end date of the research	24/Sep/2012		24/Sep/2015
Aims and objectives of the research	Make clear the advantages and disadvantages of Government interventions in China. Help high-tech firms make good use of different policies. To see if the theories which were proved by high-tech SMEs in developed countries are also to cover the case of developing countries.		
Please indicate any sources of funding for the research			

Part B: Ethical Considerations

Describe the methodology that will be applied in the project (no more than 250 words)	Mix methodology: first, Interview. I will interview 10 individuals in China. Two are public officials; two are professors in university; six are managers in high-tech firms. I will have face-to-face interviews with them. Second, send questionnaires to high-tech firms that have been selected. There will be 200 high-tech firms and I will send questionnaire by email.
Describe the method by which you will recruit participants and gain their informed consent. If written consent will not be obtained, this must be justified.	First: Interviewees. The professors from university: find their information and profile from universities' homepage, and send email to them directly. Ask for a favour. The public officials: my parents worked in the other department of

<p><i>[Note: Please attach a copy of any Information Statements and Consent Forms used, including translation if research is to be conducted with non-English speakers]</i></p>	<p>government, and they are more than happy to introduce some public officials who work on this area to me. The managers in high-tech firm: send them email or call them directly. And also ask friends for help. Second, survey respondents. Just send email to them randomly who I find from internet and government homepage.</p>
<p>Will there be any possible harm that your project may cause to participants (e.g. psychological distress or repercussions of a legal, political or economic nature)? What precautions will be taken to minimise the risk of harm to participants?</p>	<p>No. I will make interview face to face and will tell the information to people who attend the interview and survey.</p>
<p>How will you ensure the security of the data collected? What will happen to the data at the end of the project, (if retained, where and how long for)?</p> <p><i>[Note: If the project involves obtaining or processing personal data relating to living individuals, (e.g. by recording interviews with subjects even if the findings will subsequently be made anonymous), you will need to ensure that the provisions of the Data Protection Act are complied with. In particular you will need to seek advice to ensure that the subjects provide sufficient consent and that the personal data will be properly stored, for an appropriate period of time.]</i></p>	<p>I will keep clear and accurate records of the procedures followed and the approvals granted during the research process, including records of the interim results obtained as well as the final research outcomes. No individuals will be named and interview will be anonymised.</p>

Part C: Ethical Assessment

Please complete the following questions in relation to your research project.

	yes	no	n/a
Will participants' rights, safety, dignity and well-being be actively respected?			
Will you describe the main details of the research process to participants in advance, so that they are informed about what to expect?			
Will you tell participants that their participation is voluntary?			
Will you tell participants that they may withdraw from the research at any time and for any reason?			
Will confidentiality be appropriately maintained at all stages of the project, including data collection, storage, analysis and reporting?			
Will any highly personal, private or confidential information be sought from participants?			
Will participants be involved whose ability to give informed consent may be limited (e.g. children)?			

	yes	no	n/a
Will participants' rights, safety, dignity and well-being be actively respected?			
Will you describe the main details of the research process to participants in advance, so that they are informed about what to expect?			
Will you tell participants that their participation is voluntary?			
Will you tell participants that they may withdraw from the research at any time and for any reason?			
Will the project raise any issues concerning researcher safety?			
Are there conflicts of interest caused by the source of funding?			

Please provide any additional information which may be used to assess your application in the space below.

10.2 Appendix 2: Consent Form

CONSENT FORM

FULL TITLE OF RESEARCH	Effects of Government Interventions on Chinese High-tech SMEs
NAME	Meiying Chen
POSITION	PGR student of Entrepreneurship
UNIVERSITY	University of Exeter, UK
CONTACT ADDRESS	Streatham Court, Rennes Drive, Exeter UK EX4 4PU
EMAIL	mc406@exeter.ac.uk

Hello, my name is Meiying Chen; I am a PGR student of Entrepreneurship in University of Exeter in UK. I am writing to ask if you would be willing to participate in my research. The purpose of this study is to learn how government interventions influence high-tech SMEs in China. If you agree to participate, I will ask you questions about what you think of the macroeconomic environment of China, the status of high-tech SMEs in China, and how you feel with the government interventions in this industry. Third Parties will **NOT** be given access to the information, and it will be analysed anonymously if you request and used for research purposes only. This will take about 30 minutes of your time.

Please Initial Box

- I agree to take part in the above study.
- I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.
- I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.
- I agree with using my name in the report.
- I agree to the interview consultation being audio recorded.
- I would like to receive a copy of the summary report on the findings of research.

My address is _____

Name of Participant: _____ Date: _____
Signature: _____

Name of Researcher: _____ Date: _____
Signature: _____

同意书

研究课题名称：政府干预对中国高科技中小企业的影响
名字：陈美瑛
职业：创新创业管理博士生
学校：英国艾克赛特大学
联系地址：Streatham Court, Rennes Drive, Exeter UK EX4 4PU
邮箱地址：mc406@exeter.ac.uk

你好，我叫陈美瑛，是在英国艾克赛特大学学习创新创业管理的博士生。我研究的课题是政府干预对中国高科技中小企业的影响。如果您同意参与这项课题的研究，我将会问您对于中国宏观经济环境，中国高科技企业情况，以及您对政府干预的看法。第三方将**绝对不会**有接触这些信息的权利，这些信息将根据您的要求被匿名研究，并且仅用于研究目的。这次访问将花费您 30 分钟的宝贵时间。

- 我同意参加上述的研究。
- 我是自愿参加这个研究讨论，并且我有权利没有任何理由的随时取消我的看法。
- 我已经明白所要研究的内容，并且知道我有权利提出质疑。
- 我同意在研究中出现我的名字。
- 我同意我们的讨论被音频录音。
- 我希望收到这个研究的总结报告。

我的地址是： _____

参与者姓名： _____ 日期： _____ 签名： _____

研究人姓名： _____ 日期： _____ 签名： _____

10.3 Appendix 3: Interview Discussion Guide: Public Officials

DISCUSSION GUIDE

PUBLIC OFFICIALS

Good morning / afternoon

I am conducting these interviews as a part of my PhD studies at the University of Exeter Business School in the UK. My thesis seeks to establish how conducive conditions in China are for the start up and development of high technology firms. I am particularly interested in how the Chinese government can play a key role in supporting and promoting high technology SMEs.

Can we begin by talking about general economic conditions in China

1. THE ECONOMY

HOW DO YOU PERCEIVED GENERAL ECONOMIC CONDITIONS IN CHINA AT THE MOMENT?

PROMPTS

- General economic growth
- Unemployment
- Exporting

AND HOW DO YOU PERCEIVE THAT THESE FACTORS HAVE CHANGED IN THE LAST 3 YEARS?

2. MARKETS AND COMPETITION

HOW DO YOU PERCEIVE THE GENERAL LEVEL OF COMPETITION IN DOMESTIC MARKETS AT THE MOMENT?

PROMPTS

- General competitiveness
- Lots of market opportunities
- Are markets dominated by SOEs

3. THE STATE OF SMES IN CHINA

NOW I WOULD LIKE TO ASK YOU ABOUT THE GENERAL STATE OF THE SME SECTOR IN CHINA

- How do you perceive that Chinese SMEs are doing at the moment in general
- Has their position strengthened or got worse in the last 3 years
- Do you know what the official definition of SMEs is in China

WHAT DISTINCTIVE CHARACTERISTICS DO SMES HAVE THAT DISTINGUISH THEM FROM LARGE FIRMS IN CHINA

- Flexibility
- Family ownership
- New technologies

WHAT ARE THE MAIN BENEFITS OF SMES

- Innovation
- Job creation
- Productivity
- GDP growth

WHAT DO YOU SEE AS THE MAJOR LIMITATIONS OF SMES IN CHINA

- Limited access to finance
- Lack of human capital (management skills)
- Inexperience
- Lack of skilled workers
- Networks
- Access to information
- Marketing
- Finding premises
- Market barriers
- Accessing suppliers
- Accessing customers

4. BUSINESS START-UP CONDITIONS

NOW I WOULD LIKE TO TALK TO YOU ABOUT HOW EASY OR DIFFICULT IT IS TO START UP A NEW BUSINESS IN CHINA

DO YOU THINK THAT THE GOVERNMENT IS GENERALLY SUPPORTIVE OF PEOPLE TRYING TO START THEIR OWN BUSINESSES

IN WHAT WAYS DO THEY SUPPORT PEOPLE

- Access to finance
- Simplified legal procedures
- Access to advice and general support
- Information and guidance

CAN YOU EXPAND ON THE COMMENTS YOU MADE? IN WHAT SPECIFIC WAYS DOES GOVERNMENT SUPPORT PEOPLE TO BECOME ENTREPRENEURS?

- Financial policies
- R&D support
- Taxation
- Education
- Training

THINKING ABOUT THE POLICY AREAS YOU JUST MENTIONED, WHAT ARE THE SPECIFIC OBJECTIVES AND OUTCOMES THAT GOVERNMENT IS TRYING TO ACHIEVE

ARE THERE REGIONAL DIFFERENCES OR DIFFERENCES BETWEEN URBAN AND RURAL AREAS IN THE PROVISION AND SCALE OF SUPPORT OFFERED BY GOVERNMENT TO SMES

- Is Beijing different
- If so why
- Infrastructure
- Competition
- Access to resource
- Easy to get advanced information
- If no why
- Higher costs
- More government regulation
- Cutthroat competition (price-war, bribery)

5. INDIRECT SUPPORT AND DIRECT SUPPORT

NOW I WOULD LIKE TO TALK TO YOU ABOUT THE MAIN SUPPORT METHODS THAT GOVERNMENT USES.

DOES GOVERNMENT TEND TO DIRECT SUPPORT HIGH-TECH FIRMS OR SUPPORT HIGH-TECH FIRMS VIA INTERMEDIARIES?

WHY YOU PREFER THAT WAY?

- If direct
- Could see if it works well or not
- Avoid the possibilities of misleading
- Avoid the possibilities of unfairness
- If indirect
- Hard to supervise
- Easy to do

6. HIGH TECHNOLOGY FIRMS

NOW I WOULD LIKE TO TALK TO YOU ABOUT THE SITUATION OF HIGH-TECH FIRMS IN CHINA

DO YOU KNOW WHAT THE OFFICIAL DEFINITION OF HIGH-TECH SMES IN CHINA

- The differences between high-tech SMEs and SMEs

WHAT ARE THE SPECIFIC REGULATIONS AND SUPPORT THAT HIGH-TECH SMES RECEIVE OR BENEFIT FROM

- Tax deduction

- External expertise
- Training opportunities
- Information
- Infrastructure

7. OWNERSHIP

NOW I WOULD LIKE TO TALK ABOUT OWNERSHIP OF HIGH-TECH SMES IN CHINA

AS WE KNOW, CHINESE HIGH-TECH FIRMS HAVE MORE CONSTRAINTS ON CONDUCTING INDEPENDENT R&D, MOST OF HIGH-TECH SMES ARE ORIGINALLY OWNED BY FOREIGN FIRMS OR OPERATE THROUGH PURCHASED PATENT AND LICENCES

WHAT PERCENTAGE OF HIGH-TECH SMES ARE WHOLLY OWNED BY CHINESE

- What products do they produce
- The main markets
- Domestic or foreign markets
- Are they VERY high-tech COMPARED TO FOREIGN OWNED

HOW DO THEY DO R&D

- Independent R&D
- How is the performance
- Their appropriability
- Rely on foreign firms patents
- How is the performance
- Their appropriability

HOW DOES PERFORMANCE OF HIGH-TECH FIRMS THAT ARE NOT WHOLLY OWNED BY CHINESE COMPARE

- If better than wholly owned high-tech SMEs, why
- Advanced information
- Parent firm support
- Chinese regulation support
- If worse than wholly owned high-tech SMEs, why
- Less market power
- Unfamiliar native culture
- High entrance barriers
- Negative regulation

8. THE LIMITATION OF WHOLLY OWNED HIGH-TECH SMES AND HIGH-TECH SMES NOT WHOLLY OWNED BY CHINESE

WHAT ARE ADVANTANGES AND DISADVANTAGES OF WHOLLY OWNED HIGH-TECH SMES

- Advantage
- Market power

- Familiar culture
- Government support
- Disadvantage
- Lack of human capital
- Less abilities to do independent R&D

CAN YOU EXPAND ON THE COMMENTS YOU MADE? IN WHAT SPECIFIC WAYS DOES GOVERNMENT SUPPORT WHOLLY OWNED HIGH-TECH SMES?

- Financial policies
- R&D support
- Taxation
- Education
- Training

WHAT ARE ADVANTAGES AND DISADVANTAGES OF HIGH-TECH SMES NOT WHOLLY OWNED BY CHINESE

- Advantages
- Advanced information
- Existing technology
- Less R&D costs
- Disadvantages
- Less market power
- Unfamiliar culture
- Negative native regulation

CAN YOU EXPAND ON THE COMMENTS YOU MADE? IN WHAT SPECIFIC WAYS DOES GOVERNMENT SUPPORT HIGH-TECH FIRMS NOT WHOLLY OWNED BY CHINESE?

DO THE DIFFERENT REGULATIONS ENCOURAGE OR HINDER THEIR PERFORMANCE

- How DO they differ
- What are the effects

HOW IS THEIR APPROPRIABILITY

- Protected
- Permanent

9. INTERNATIONALISATION

NOW I WOULD LIKE TO TALK TO YOU ABOUT THE GLOBALISATION OF HIGH-TECH FIRMS IN CHINA

WHEN DO HIGH-TECH FIRMS GO GLOBAL

- Start-ups
- 3-5 years

- 5 years or more

DO CHINESE HIGH-TECH SMES GO GLOBAL VERY NORMALLY

- If so why
- The main characteristic of high-tech firms
- Government promotion
- Good products
- opportunities
- If no why
- Strong international competition
- Less government support
- Financial limitation
- Less opportunities
- Lack of human capital

WHAT KINDS OF SUPPORT DO GOVERNMENT PROVIDE TO PROMOTE INTERNATIONALISATION

- Taxation
- Financial policies
- Less entrance barriers
- Access to network
- Advanced information
- Exchange guarantee

IF FIRMS HAVE ALREADY GONE GLOBAL, WHAT KIND OF SUPPORT DO GOVERNMENT PROVIDE TO STRENGTHEN THEIR INTERNATIONAL POSITION

- Taxation
- Financial policies
- Less entrance barriers
- Access to network
- Advanced information
- Exchange guarantee

WHAT ARE THE MAIN BARRIERS FOR INTERNATIONALISATION

- The ten barriers ranked by SMEs from the OECD-APEC 2007

WHAT KINDS OF SMES FIND IT EASIER TO GO GLOBAL

- Firms with international experienced managers
- Sufficient financial capital
- High R&D quality

IT IS THE END OF MY INTERVIEW, THANK YOU FOR YOUR PATIENT AND SUPPORT.

IF YOU HAVE ANY OTHER COMMENTS, IT WILL BE VERY WELCOME.

10.4 Appendix 4: Interview Discussion Guide: Technology-based SMEs

DISCUSSION GUIDE

HIGH-TECH FIRMS

Good morning/ afternoon

I am conducting these interviews as a part of my PhD studies at the University of Exeter Business School in the UK. My thesis seeks to establish how conducive conditions in China are for the start up and development of high technology firms. I am particularly interested in how the Chinese government can play a key role in supporting and promoting high technology SMEs.

In order to strengthen the aim of the research, I have divided the high-tech firms into two categories: high-tech firms that wholly owned by Chinese and others. Then, compare the effects of different policies on two categories.

Can we begin by talking about general economic conditions in China

1. THE ECONOMY

HOW DO YOU PERCEIVED GENERAL ECONOMIC CONDITIONS IN CHINA AT THE MOMENT?

- General economic growth
- Unemployment
- exporting

AND HOW DO YOU PERCEIVE THAT THESE FACTORS HAVE CHANGED IN THE LAST 3 YEARS?

2. MARKETS AND COMPETITION

HOW DO YOU PERCEIVE THE GENERAL LEVEL OF COMPETITION IN DOMESTIC MARKETS AT THE MOMENT?

PROMPTS

- General competitiveness
- Lots of market opportunities
- Are markets dominated by SOEs

3. THE STATE OF SMES IN CHINA

NOW I WOULD LIKE TO ASK YOU THE GENERAL STATE OF THE SME SECTOR IN CHINA

HOW DO YOU PERCEIVE GENERAL STATE OF SME SECTOR IN CHINA AT THE MOMENT?

- Has the position strengthened or got worse in the last 3 years

WHAT DISTINCTIVE CHARACTERISTICS DO YOU HAVE THAT DISTINGUISH YOU FROM LARGE FIRMS IN CHINA

- Flexibility
- Family ownership
- New technologies

WHAT DO YOU PERCEIVE TO BE THE MAIN BENEFITS OF SMES

- Innovation
- Job creation
- Productivity
- GDP growth

IN YOUR OPINION, WHAT ARE THE MAJOR LIMITATIONS OF SMES IN CHINA

- Limited access to finance
- Lack of human capital (management skills)
- Inexperience
- Lack of skilled workers
- Networks
- Access to information
- Marketing
- Finding premises
- Market barriers
- Accessing suppliers
- Accessing customers

4. BUSINESS START-UP CONDITIONS

NOW I WOULD LIKE TO TALK TO YOU ABOUT HOW EASY OR DIFFICULT IT IS TO START UP A NEW BUSINESS IN CHINA

WHAT ARE THE MAIN BARRIERS FOR PEOPLE TO START A BUSINESS

- Financial limitation
- Lack of experience
- Lack of an entrepreneurship culture
- Lack of information and guidance
- Strong market competition
- Monopolised by large firms
- Complicated legal procedures
- Lack of access to advice and general support

DO YOU THINK THAT THE GOVERNMENT IS GENERALLY SUPPORTIVE OF PEOPLE TRYING TO START THEIR OWN BUSINESSES

IN WHAT WAYS DO THEY SUPPORT PEOPLE

- Access to finance
- Simplified legal procedures
- Access to advice and general support
- Information and guidance

- Fair market condition

CAN YOU EXPAND ON THE COMMENTS YOU MADE? IN WHAT SPECIFIC WAYS DOES GOVERNMENT SUPPORT PEOPLE TO BECOME ENTREPRENEURS?

- Financial policies
- R&D support
- Taxation
- Education
- Training
- Other (please specify)

THINKING ABOUT THE POLICIES YOU JUST MENTIONED, WHAT DO YOU PERCEIVE AS THE BEST PROMOTED POLICIES AND THOSE THAT HAVE POSITIVE EFFECTS ON THE SME SECTOR?

HAVE YOU RECEIVED ANY SUPPORT FROM GOVERNMENT WHEN YOU START A BUSINESS?

- If yes, what TYPE OF SUPPORT, AND WAS IT HELPFUL
- If no, why

ARE THERE REGIONAL DIFFERENCES OR DIFFERENCES BETWEEN URBAN AND RURAL AREAS IN THE PROVISION AND SCALE OF SUPPORT OFFERED BY GOVERNMENT TO SMES

- Is Beijing different
- If so why
- Infrastructure
- Competition
- Access to resource
- Easy to get advanced information
- If no why
- Higher costs
- More government regulation
- Cutthroat competition (price-war, bribery)

5. INDIRECT SUPPORT AND DIRECT SUPPORT

NOW I WOULD LIKE TO TALK TO YOU ABOUT THE MAIN SUPPORT METHODS THAT GOVERNMENT USES.

DOES GOVERNMENT TEND TO DIRECT SUPPORT HIGH-TECH FIRMS OR SUPPORT HIGH-TECH FIRMS VIA INTERMEDIARIES?

IN YOUR OPINION, WHICH WAY IS MORE EFFICIENT?

6. HIGH TECHNOLOGY FIRMS

NOW I WOULD LIKE TO TALK TO YOU ABOUT THE SITUATION OF HIGH-TECH SMES IN CHINA

WHAT ARE THE SPECIFIC REGULATIONS AND SUPPORT THAT HIGH-TECH SMES RECEIVE OR BENEFIT FROM

- Tax deduction
- External expertise
- Training opportunities
- Information
- Infrastructure
- Other (please specify)

7. OWNERSHIP

NOW I WOULD LIKE TO TALK ABOUT OWNERSHIP OF HIGH-TECH SMES IN CHINA

AS WE KNOW, CHINESE HIGH-TECH FIRMS HAVE MORE CONSTRAINTS ON CONDUCTING INDEPENDENT R&D, MOST OF HIGH-TECH SMES ARE ORIGINALLY OWNED BY FOREIGN FIRMS OR OPERATE THROUGH PURCHASED PATENT AND LICENCES

ARE YOU WHOLLY OWNED HIGH-TECH FIRMS OR THE OTHER

- If wholly owned high-tech firms
- What products do you produce
- What do you perceive that other wholly owned firms mainly produce
- And what are their main markets (domestic or foreign markets, national or regional markets)
- Are they VERY high-tech COMPARED TO FOREIGN OWNED
- If you are not wholly owned high-tech firms
- What products do you produce
- What do you perceive that other firms like you mainly produce
- And what are their main markets (domestic or foreign markets, national or regional markets)
- Are they VERY high-tech COMPARED TO WHOLLY OWNED FIRMS

7.1 IF YOU ARE WHOLLY OWNED

HOW DO YOU DO R&D

- Independent R&D
- R&D cooperation
- FDI
- External expertise
- University spin-off
- Rely on foreign firms patents
- How is the performance
- Their appropriability

WHAT ARE THE ADVANTAGES AND DISADVANTAGES

- **Advantages**
- **Market power**
- **Familiar culture**
- **Government support**
- **Disadvantages**
- **Lack of human capital**
- **Less abilities to do independent R&D**

CAN YOU EXPAND ON THE COMMENTS YOU MADE? IN WHAT SPECIFIC WAYS DOES GOVERNMENT SUPPORT WHOLLY OWNED HIGH-TECH SMES?

- **Financial policies**
- **R&D support**
- **Taxation**
- **Education**
- **Training**

WHAT ARE THE EFFECTS

WHO ARE YOUR MAIN COMPETITORS

- **Not wholly owned**
- **Large firms**
- **Substitute**
- **Foreign firms from other countries**

7.2 IF YOU ARE NOT WHOLLY OWNED BY CHINESE

HOW DO YOU DO R&D

- **Existing technology (parent company)**
- **R&D cooperation**
- **FDI**
- **External expertise**
- **With university**
- **Independent R&D**
- **How is the performance**
- **Their appropriability**

WHAT ARE THE ADVANTAGES AND DISADVANTAGES

- **Advantages**
- **Advanced information**
- **Existing technology**
- **Less R&D costs**
- **Disadvantages**
- **Less market power**
- **Unfamiliar culture**
- **Negative native regulation**

CAN YOU EXPAND ON THE COMMENTS YOU MADE? IN WHAT SPECIFIC WAYS DOES GOVERNMENT SUPPORT NOT WHOLLY OWNED HIGH-TECH SMES?

WHAT ARE THE EFFECTS

DO YOU MEET DIFFERENT TAX POLICIES

- Tax free
- Tax deduction
- More tax

WHO ARE YOUR MAIN COMPETITORS

- Wholly owned
- Large firms
- Substitute
- Foreign firms from other countries

HOW DOES PERFORMANCE OF HIGH-TECH FIRMS THAT ARE NOT WHOLLY OWNED BY CHINESE COMPARE

- If better than wholly owned high-tech SMEs, why
- Advanced information
- Parent firm support
- Chinese regulation support
- If worse than wholly owned high-tech SMEs, why
- Less market power
- Unfamiliar native culture
- High entrance barriers
- Negative regulation

8. APPROPRIABILITY

NOW I WOULD LIKE TO TALK TO YOU ABOUT THE APPROPRIABILITY IN CHINA

AS YOU KNOW, THE LAW ON APPROPRIABILITY IS STILL IMPERFECT, IT SHOULD BE A BIG LIMITATION FOR THE DEVELOPMENT OF HIGH-TECH FIRMS.

HOW IS YOUR APPROPRIABILITY?

- Protected
- Permanent
- Frequently be copied
- Not protected by law
- Temporary

DO YOU HAVE SOLUTIONS FOR THIS SITUATION, AND DO YOU RECEIVE ANY SUPPORT FROM GOVERNMENT?

9. INTERNATIONALISATION

NOW I WOULD LIKE TO TALK TO YOU ABOUT THE GLOBALISATION OF HIGH-TECH FIRMS IN CHINA

GENERALLY, WHEN DO HIGH-TECH FIRMS GO GLOBAL?

- Start-ups
- 3-5 years
- 5 years or more

DO CHINESE HIGH-TECH SMES GO GLOBAL NORMALLY?

- If so why
- The main characteristic of high-tech firms
- Government promotion
- Good products
- opportunities
- If no why
- Strong international competition
- Less government support
- Financial limitation
- Less opportunities
- Lack of human capital

WHAT KINDS OF SUPPORT DO GOVERNMENT PROVIDE TO PROMOTE INTERNATIONALISATION ?

- Taxation
- Financial policies
- Less entrance barriers
- Access to network
- Advanced information
- Exchange guarantee

DOES YOUR FIRM GO GLOBAL?

- If yes, when
- Why
- What supports do you receive from government
- What barriers do you meet
- If no, why
- Did you receive any support from government
- What are the main barriers

IN YOUR OPINION, WHAT KINDS OF SMES FIND IT EASIER TO GO GLOBAL?

- Firms with international experienced managers
- Sufficient financial capital
- High R&D quality

IT IS THE END OF MY INTERVIEW, THANK YOU FOR YOUR PATIENT AND SUPPORT.

IF YOU HAVE ANY OTHER COMMETS, IT WILL BE VERY W

10.5 Appendix 5: Transcribe Interview Example

Sources		Look for:	Search In	Interview	Find Now	Clear	Advanced																																																																																																																
<ul style="list-style-type: none"> Internals <ul style="list-style-type: none"> Interview Externals Memos Framework Matrices 	Interview <table border="1"> <thead> <tr> <th>Name</th> <th>Nodes</th> <th>References</th> <th>Created On</th> <th>Created By</th> <th>Modified On</th> <th>Modified By</th> <th></th> </tr> </thead> <tbody> <tr><td>Cai</td><td>45</td><td>68</td><td>15/03/2015 16:11</td><td>MC</td><td>03/04/2015 14:21</td><td>MC</td><td>●</td></tr> <tr><td>He</td><td>17</td><td>27</td><td>15/03/2015 16:11</td><td>MC</td><td>15/03/2015 17:39</td><td>MC</td><td>●</td></tr> <tr><td>Rui</td><td>52</td><td>97</td><td>15/03/2015 16:11</td><td>MC</td><td>04/04/2015 17:48</td><td>MC</td><td>●</td></tr> <tr><td>Tie</td><td>31</td><td>49</td><td>15/03/2015 16:11</td><td>MC</td><td>04/04/2015 17:48</td><td>MC</td><td>●</td></tr> <tr><td>Xu</td><td>36</td><td>74</td><td>15/03/2015 16:11</td><td>MC</td><td>02/04/2015 18:39</td><td>MC</td><td>●</td></tr> <tr><td>Wen</td><td>11</td><td>27</td><td>15/03/2015 16:11</td><td>MC</td><td>17/03/2015 15:36</td><td>MC</td><td>●</td></tr> <tr><td>Yan</td><td>17</td><td>38</td><td>15/03/2015 16:11</td><td>MC</td><td>04/04/2015 18:03</td><td>MC</td><td>●</td></tr> <tr><td>Lei</td><td>19</td><td>42</td><td>15/03/2015 16:11</td><td>MC</td><td>04/04/2015 17:32</td><td>MC</td><td>●</td></tr> <tr><td>Li</td><td>12</td><td>23</td><td>15/03/2015 16:11</td><td>MC</td><td>18/03/2015 14:42</td><td>MC</td><td>●</td></tr> <tr><td>Ying</td><td>9</td><td>14</td><td>15/03/2015 16:11</td><td>MC</td><td>03/04/2015 14:44</td><td>MC</td><td>●</td></tr> <tr><td>York</td><td>28</td><td>54</td><td>15/03/2015 16:11</td><td>MC</td><td>17/03/2015 21:32</td><td>MC</td><td>●</td></tr> <tr><td>Zh</td><td>33</td><td>77</td><td>15/03/2015 16:11</td><td>MC</td><td>03/04/2015 14:44</td><td>MC</td><td>●</td></tr> <tr><td>刘</td><td>12</td><td>19</td><td>15/03/2015 16:11</td><td>MC</td><td>17/03/2015 20:14</td><td>MC</td><td>●</td></tr> </tbody> </table>							Name	Nodes	References	Created On	Created By	Modified On	Modified By		Cai	45	68	15/03/2015 16:11	MC	03/04/2015 14:21	MC	●	He	17	27	15/03/2015 16:11	MC	15/03/2015 17:39	MC	●	Rui	52	97	15/03/2015 16:11	MC	04/04/2015 17:48	MC	●	Tie	31	49	15/03/2015 16:11	MC	04/04/2015 17:48	MC	●	Xu	36	74	15/03/2015 16:11	MC	02/04/2015 18:39	MC	●	Wen	11	27	15/03/2015 16:11	MC	17/03/2015 15:36	MC	●	Yan	17	38	15/03/2015 16:11	MC	04/04/2015 18:03	MC	●	Lei	19	42	15/03/2015 16:11	MC	04/04/2015 17:32	MC	●	Li	12	23	15/03/2015 16:11	MC	18/03/2015 14:42	MC	●	Ying	9	14	15/03/2015 16:11	MC	03/04/2015 14:44	MC	●	York	28	54	15/03/2015 16:11	MC	17/03/2015 21:32	MC	●	Zh	33	77	15/03/2015 16:11	MC	03/04/2015 14:44	MC	●	刘	12	19	15/03/2015 16:11	MC	17/03/2015 20:14	MC	●
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10.6 Appendix 6: Questionnaire (First Draft)

12.12.2013

Effects of Government Interventions on Chinese High-tech SMEs

A survey as a part of PGR study in University of Exeter in the UK

Please note: Third parties will NOT be given access to individual company data. Data will be analysed anonymously and used for research purposes only.

If you have any queries about this survey, please contact Meiyong Chen at Exeter Business School:

Phone:

E-mail: mc406@exeter.ac.uk

Company profile

1. Please state the year of formation (first legal incorporation) of your company:

2. Was your company founded as:
 - A. Independent new private enterprise (Natural Person Holding)
 - B. State-owned enterprise
 - C. Management buy-out
 - D. Management buy-in
 - E. Subsidiary of another firm (in China)
 - F. Subsidiary of another firm (from abroad)
 - G. De-merger or spin-out from an existing firm (in China)
 - H. De-merger or spin-out from an existing firm (from abroad)
 - I. Other (e.g. merger), please state: _____
3. What are the advantages of the organisational form (see question 2)? (please tick the choice you make)

advantages

- Market power
- Familiar culture
- Positive government support
- Existing R&D or Technology
- Less R&D costs
- Advanced information
- Others _____

4. Who are your main competitors? (multiple choice)
 - A. Wholly owned SMEs
 - B. Large firms
 - C. Firms with similar products/services
 - D. Foreign firms
 - E. Jointly owned Chinese-foreign firm
 - F. Others _____

5. Which industry does your firm belong to:

- A. Agriculture/Fishery/Animal husbandry/Forestry
- B. Industry
- C. Construction
- D. Wholesale
- E. Retail
- F. Transport
- G. Warehousing
- H. Post
- I. Hotel & Restaurant
- J. Information transmission
- K. Software and information service industry
- L. Real estate development and management
- M. Property management
- N. Others: _____

6. Please indicate the TOTAL turnover of your company:

- ❖ in the FIRST year your company had sales: ¥ _____
- ❖ in the year you FIRST got government support: ¥ _____
- ❖ in the LAST financial year: ¥ _____
- ❖ the year-end forecast for your CURRENT financial year: ¥ _____

7. How many persons were/are employed your company (including owners)?

- ❖ At the time of start-up:
- ❖ At the time got government support:
- ❖ Today:

8. How many employees have technical/scientific education at degree level: _____

9. How much did you spend on R&D in your last financial year? _____%of total sales

10. How many employees currently work exclusively or for at least 50% of their time on the development of existing and new product? _____(in full-time equivalents)

11. What products do you mainly produce? _____

12. How many persons were founders of the enterprise? _____

What is the nationality of partners?

- ❖ Chinese (from mainland China, not returnee)
- ❖ Chinese (from mainland China, returnee)
- ❖ Chinese (from Hong Kong, Macao, and Taiwan)
- ❖ Foreigner: from _____

If more than one, had any of the founders worked together for a period of at least 6 months prior to start-up?

- ❖ Yes
- ❖ No

Economic profile

13. How do you perceive general state of SME sector in China at the moment?



14. How strong do you perceive that the government support on SMEs?



15. In your opinion, what are the limitations of SMEs in China? (Indicate the strength of the limitation. 1=not at all limiting 2=a little limiting 3=fairly limiting 4=very limiting)

- Limited access to finance
- Lack of human capital (management skills)
- Inexperience
- Lack of skilled workers
- Lack of networks
- Limited abilities to access to information
- Marketing
- Finding premises
- Market barriers
- Accessing suppliers
- Accessing customers
- Strong competition with large firms
- Less positive supports from government
- Others _____

Business Start-up Conditions

16. What are the barriers for people to start a business? (Indicate the strength of the barrier. 1=not a barrier at all. 2=A minor barrier. 3=A modest barrier. 4=A significant barrier)

- Financial limitation
- Lack of experience
- Lack of an entrepreneurship culture
- Lack of information and guidance
- Strong market competition
- Monopolised by large firms
- Complicated legal procedures
- Lack of access to advice and general support
- Others _____

17. Do you think that the government is generally supportive of people trying to start their own businesses?



18. How do you do R&D? (multiple choice)

- Independent R&D
- Existing technology (from parent company)
- R&D cooperation
- FDI
- External expertise (from governmental institutions)
- External expertise (from non-governmental institutions)
- University spin-off
- Rely on foreign firms patents
- Others _____

19. Please indicate whether your company received any of the government support?
(E.g. financial support, education and training opportunities, external expertise and guidance, free or lower cost infrastructure supplied by government)

- Yes: please indicate all supports you received _____

(To question No.20)
- No (To question No.24)

Firms with governmental supports

20. Where did you get the information? (multiple choice)

- ❖ From internet
- ❖ From counterparts
- ❖ From governmental websites
- ❖ From intermediaries
- ❖ From family members or friends
- ❖ Others _____

21. What are the specific regulations and support that high-tech SMEs receive or benefit from? (Please rank it. Don't need to rank all of the options)

- Tax deduction
- External expertise
- Financial supports
- Training opportunities
- Information supplied by government
- Infrastructure
- Support of internationalisation
- Other _____

22. As you received specific support from government, what kind of benefits do you receive?

- A. Increase of operation revenue: _____% increase
- B. Increase of R&D expenditure: _____% increase
- C. Increase employment: _____% increase
- D. Higher level of brand recognition
- E. Increasing market share
- F. Increasing business network
- G. Competitive market power with large firms and state owned firms

23. In your opinion, what is the reason that you have been chosen to be the receiver of supports? (to question 26)

- A. Not many firms know the information
- B. I'm the exemplary enterprise
- C. I have potential to grow my business
- D. I have close relationship with government, and got the priority
- E. Others _____

Firms without governmental supports

24. What is the reason that you never received any support from government? (multiple choice)

- A. I don't know the information
- B. I'm not exemplary enterprise
- C. They didn't recognise my potential
- D. They have closer relationship with government, and have priority
- E. Others _____

25. Compared with firms received government support, do you meet any constraints with your operation?

- A. Unfair market condition
- B. Low brand recognition
- C. More operate costs
- D. Lower market share
- E. No access to useful information
- F. Others _____

Appropriability

26. How is your appropriability?

- Protected

- Permanent
- Frequently be copied
- Not protected by law
- Temporary

27. How is governmental support in terms of appropriability?

- 1
- 2
- 3
- 4
- others

Internationalisation

28. Do you go international?

- Yes, at YEAR _____ I begin to have international trade (to question 29)
- No (to question 32)

29. Why you decide to go global? (multiple choice)

- A. Encouraged by government policies
- B. It is the main characteristic of high-tech firms
- C. Most of my counterparts do it
- D. Huge market potential and opportunities in global market
- E. There is a manager in my firm who have international trade experience
- F. Lessened market in China
- G. I have sufficient capital
- H. I am not concerned about the risks of expanding internationally
- I. Others _____

30. What barriers do you meet? (Please indicate the strength of any barriers you might face in internationalising. 1=not a barrier at all. 2=A minor barrier. 3=A modest barrier. 4=A significant barrier)

- Shortage of working capital to finance exports
- Identifying foreign business opportunities
- Limited information to locate/analyse markets
- Inability to contact potential overseas customers
- Obtaining reliable foreign representation
- Lack of managerial time to deal with internationalisation
- Inadequate quantity of and/or untrained personnel for internationalisation
- Difficulty in matching competitors' prices
- Lack of home government assistance/incentives
- Excessive transportation costs
- Developing new products for foreign markets
- Unfamiliar foreign business practices
- Unfamiliar exporting procedures/paperwork
- Meeting export product quality/standards/specification
- Others _____

31. Do you receive any support that government provide to promote internationalisation? (multiple choice) (to question 33)

- A. Taxation
- B. Financial policies
- C. Less entrance barriers
- D. Access to network advanced information
- E. Exchange guarantee
- F. Others _____

32. Why don't you expand to international market? (to question 33)

- A. I'm afraid of stronger international competition
- B. I have no access to government support
- C. I don't know there is government support on international business
- D. I don't have enough financial capital
- E. I didn't realise any opportunities to go global
- F. I don't have a manager who have international trade experience
- G. I don't want to go global, no reason
- H. Others _____

33. In your opinion, what kinds of SMEs find it easier to go global?

- A. Firms with international experienced managers
- B. Sufficient financial capital
- C. High R&D quality
- D. Old firms
- E. Others_____

10.7 Appendix 7: Pre-test Questionnaire

12.03.2014

Effects of Government Interventions on Chinese High-tech SMEs

A survey as a part of PGR study in University of Exeter in the UK

Please note: This survey is conducted as part of a PhD research at University of Exeter regarding the effects of government interventions on high-tech SMEs in China. The participation is completely voluntary and any the responses to this survey will be kept confidential. No access will be given to third parties. Data will be documented securely and analysed anonymously, and used for research purposes only.

If you have any queries about this survey, please contact Meiyong Chen at Exeter Business School:

Phone: 15711136787 (China)/00447429342466 (UK)

E-mail: mc406@exeter.ac.uk

Part One: Company Profile

1. Which industry does your firm belong to _____; what are the main products and/or services do you provide? _____
2. Please state the year of establishment (first legal incorporation) of your company: ____; Was your company founded as:
 - A. Independent new private enterprise (Natural Person Holding)
 - B. State-owned enterprise
 - C. Management buy-out
 - D. Management buy-in
 - E. Subsidiary of another Chinese firm
 - F. Subsidiary of another overseas firm
 - G. De-merger or spin-out from an existing Chinese firm
 - H. De-merger or spin-out from an existing overseas firm
 - I. Other (e.g. merger), please state: _____
3. What are the advantages of the organisational form of your company (see question 2)? (please choose relevant option(s) from lists below)

advantages

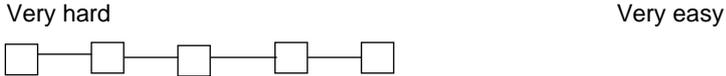
- Sufficient Financial Capital
- Strong Market Power
- Advantages in Accessing Information
- An Existing Network
- Abundant Human Resources
- Access to International Market
- Familiarity to Local Culture
- Government Support
- Achieved R&D facility or Technology
- Less R&D Costs

<input type="checkbox"/> Better Capability in Conducting Independent R&D <input type="checkbox"/> Others _____

4. Is your firm a national-level high-tech firm? Yes ___ No ___
 Is your firm a Haidian-level high-tech firm? Yes ___ No ___

Do you consider/understand your company as a high-tech firm? Yes ___ No ___

To what extent do you think it is easy to be qualified as a high-tech firm?



5. Who are your main competitors? (multiple choice)

- A. SMEs providing similar products/services
- B. Large firms providing similar products/services
- C. Similar foreign products/services
- D. Others _____

6. Please indicate the TOTAL turnover of your company:

- ❖ Annual sales for the FIRST year following establishment: ¥ _____
- ❖ Annual sales for the year following being qualified as high-tech firm: ¥ _____ (leave blank if not applicable)
- ❖ Annual sales for the LAST financial year: ¥ _____
- ❖ The proportion of R&D expenditure in sales of last financial year: _____ %
- ❖ The year-end prediction for your CURRENT financial year: ¥ _____
- ❖ Since founding the firm, the sales increasing rate: _____

7. How many employees were/are in your company (including founders)?

	Number of employees below bachelor degree-level	Number of employees with bachelor degree or above	Number of employees who are oversea returnees
At the start-up stage			
When qualified as a high-tech firm			
Currently			

8. How many full-time employees currently work exclusively or for at least 50% of their time on the development of existing and new product? _____

9. Before found your enterprise, what did you do? (please choose relevant options and indicate how long you have been under that category)

	Founder 1	Founder 2	Founder 3	Founder 4	Founder 5
Founders					
Oversea returnees					
Graduates without work experience					
Employee in another SMEs within the same industry					
Employee in another SMEs in a different industry					
Employee in a large firm within the same industry					

Employee in a large firms in a different industry
 Owner of a firm (already closed) in the same industry
 Owner of a firm (already closed) in different industry
 Researcher in an institution in China
 Others (please indicate)

Part Two: Economic Profile

10. How do you perceive general state of SME sector in China at the moment? (please tick the choice you make)

Very Weak Very Strong

— — — —

11. How strong do you perceive that the government support for SMEs in China? (please tick the choice you make)

Strongly ignored Strongly supportive

— — — —

12. In your opinion, what are the limitations of SMEs in China? (Indicate the strength of the limitation)

	Strongly agree	agree	disagree	Strongly disagree	Neither
Limited access to finance	<input type="checkbox"/>				
Lack of financial capital	<input type="checkbox"/>				
High taxation burden	<input type="checkbox"/>				
Strong competition from large firms	<input type="checkbox"/>				
Strong market competition from SMEs	<input type="checkbox"/>				
High market barriers	<input type="checkbox"/>				
Lack of human capital (management skills)	<input type="checkbox"/>				
Lack of technicians	<input type="checkbox"/>				

Inexperience in operating a firm	<input type="checkbox"/>				
Lack of networks	<input type="checkbox"/>				
Limited access to information	<input type="checkbox"/>				
Limited abilities to target potential market	<input type="checkbox"/>				
Lack of supports from government	<input type="checkbox"/>				
Lack of cooperation with suppliers	<input type="checkbox"/>				
Difficulty in finding premises	<input type="checkbox"/>				
Others					

Part Three: Business Start-up Conditions

13. What are the barriers for people to start a business?

	Strongly agree	agree	disagree	Strongly disagree	Neither
Financial limitation	<input type="checkbox"/>				
Lack of experience	<input type="checkbox"/>				
Lack of an favourable environment for entrepreneurship	<input type="checkbox"/>				
Lack of information and guidance	<input type="checkbox"/>				
Strong market competition	<input type="checkbox"/>				
High entrance barriers	<input type="checkbox"/>				
Monopoly/Oligopoly by large firms	<input type="checkbox"/>				
Monopoly/Oligopoly by stated-owned firms	<input type="checkbox"/>				

Complicated legal procedures	<input type="checkbox"/>				
Lack of access to advice and general support	<input type="checkbox"/>				
Lack of government support	<input type="checkbox"/>				
High taxation burden	<input type="checkbox"/>				
Others					

14. Do you think if the government is generally supportive to entrepreneurs willing to start up their own businesses? (please tick the choice you make)



15. Your start-up capital is mainly from:

- A. Self-raised funds (your reserves or borrowings from family or friends)
- B. Investment from State-owned firms
- C. Investment from government
- D. Bank loan
- E. Venture capital
- F. Angel fund
- G. Financing from other capitalists (please indicate _____)
- H. Others _____

16. After start-up stage, what sources do you access to for additional finance? (multiple choice)

	Already tried this way	Plan to use this way	Don't know yet
Equity financing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Venture capital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bank loans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government capital involved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Self-raised funds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Initial public offering (IPO)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others			

17. Are you familiar with the science park in Beijing?

- If yes, where did you get the information? (Multiple choice)
 - A. From internet
 - B. From counterparts
 - C. From governmental websites
 - D. From intermediaries
 - E. From family members or friends
 - F. Others _____
- If no, the reasons are _____ (Multiple choice)
 - A. Know it but not very familiar with it

- B. Never heard about it
- C. Not interested in these area
- D. Others _____

18. Is your firm located on a science park in Beijing?

- If yes: name of the science park _____; the year your firm moved in or founded in this science park _____; (To question No.19)
- No (skip to question No.22)

Part Four: Firms in and outside the Science Park

Firms in the Science Park

19. Why do you moved in or founded in this science park? (multiple choice)

- A. Originally located in nearby
- B. Better access to government support
- C. Better access to advanced information about policy tendency
- D. Better access to advanced information about market
- E. Better access to capital market
- F. To expand the network
- G. Rent is lower
- H. Housing subsidies
- I. Was attracted by Beijing hukou (registered permanent residence permission) quota
- J. Was attracted by cluster effect
- K. Just respond to the call of government
- L. Others _____

20. Do you think preferential policies give priorities to enterprises in the science park?

- If yes, the reasons are _____ (multiple choice)
 - A. Geographical concentration (not usually forgotten or ignored)
 - B. The science park has government background
 - C. The science park has strong connection with government
 - D. Advanced information (the science park passes information quickly)
 - E. Advanced information (get information from other firms in the same park)
 - F. Generally assumed as well-run firms
 - G. The science park could help remedy firms' limitations
 - H. Others _____
- If no, the reasons are _____
 - A. There exists competitive firms outside science park
 - B. Targets are all high-tech firms in Beijing
 - C. Did not feel the differences
 - D. Others _____

21. Do you think that firms in a science park perform better than firms outside a science park?

- If yes, the reasons are _____
 - A. Better access to government support
 - B. Advanced information: about the policy tendency
 - C. Advanced information: about market
 - D. Better access to finance
 - E. Expanded network
 - F. Lower rent fee
 - G. Housing subsidies
 - H. Science park can help remedy firms' limitations

- If no, the reasons are _____

- A. Market demands are the main source for the development of firms
- B. Firms outside of science park can also get essential advanced information
- C. Firms outside of science park can also get access to governmental resources
- D. Firms outside of science park can operate with more flexibility
- E. Others_____

(To question 24)

Firms outside the Science Park

22. Why don't you consider moving to a science park? (multiple choice)

- A. Not familiar with science park
- B. Do not think joining in a science park will conducive to the development of firms
- C. Have enough resources to develop the firm (e.g. network, human capital or money)
- D. Consideration about geographic distance to main customers
- E. Consideration about geographic distance for employees
- F. Do not think as qualified to join in the science park
- G. Do not think there are any differences between operating firms in and outside a science park
- H. Discouraged by complicated applying procedures
- I. Others_____

23. Do you think preferential policies give priorities to enterprises in the science park?

- If yes, the reasons are_____ (multiple choice)
 - A. Geographical concentration (not usually forgotten or ignored)
 - B. The science park has government background
 - C. The science park has strong connection with government
 - D. Advanced information (the science park passes information quickly)
 - E. Advanced information (get information from other firms in the same park)
 - F. Generally assumed as well-run firms
 - G. The science park could help remedy firms' limitations
 - H. Others_____
- If no, the reasons are_____
 - A. There exists competitive firms outside science park
 - B. Targets are all high-tech firms in Beijing
 - C. Can receive the same information from government outside
 - D. Do not feel the differences
 - E. Others_____

Part Five: Government Support

24. Which government support do you think are conducive to the development of a high-tech SMEs?

	Very important	important	Unimportant	Very unimportant	Neither
Taxation relief	<input type="checkbox"/>				
External expertise	<input type="checkbox"/>				
Financial supports (providing free government investment)	<input type="checkbox"/>				
Financial supports (discounted interest on bank loans)	<input type="checkbox"/>				

Financial supports (research funds provided by government)	<input type="checkbox"/>				
Indirect financial supports (from venture capital that received governmental guiding funds)	<input type="checkbox"/>				
Housing subsidies	<input type="checkbox"/>				
Advice and guidance from government	<input type="checkbox"/>				
Support of internationalisation	<input type="checkbox"/>				
Training and education opportunities	<input type="checkbox"/>				
Advanced information that benefit development of firms	<input type="checkbox"/>				
Free or low cost infrastructure	<input type="checkbox"/>				
Others					

(In this part, if you get any support from government, please to 25, if you didn't get any support, please to 29)

25. What government support have you actually received? (multiple choice)

- A. Tax relief
- B. External expertise
- C. Financial supports (government investment)
- D. Financial supports (discounted interest on bank loans)
- E. Financial supports (research funds provided by government)
- F. Indirect financial supports (from venture capital that got governmental guiding fund)
- G. Housing subsidies
- H. Advice and guidance from government
- I. Support of internationalisation
- J. Training and education opportunities
- K. Advanced information that benefit development of firms
- L. Free or low cost infrastructure
- M. Others _____

26. As the result of specific support from government, what kind of benefits do you receive? (multiple choice)

- A. Increase in operation revenue
- B. Increase in R&D expenditure
- C. Increase in employment
- D. Higher level of brand recognition
- E. Increase in working capital
- F. Increase in market share
- G. Increase in business network
- H. Competitive advantages in market power against large firms and state owned firms
- I. Competitive advantages in market power against firms in the similar size

J. Others _____

27. In your opinion, to what extent do you consider government intervention useful?

Very useful Very useless

— — — —

28. In your opinion, what is the reason for you to be chosen to receive government support?

(multiple choice)

- A. Not many firms know the information
- B. My firm is an exemplary enterprise
- C. I have potential to grow my business
- D. I have close relationship with government, and got the priority
- E. I got advanced information from government
- F. I had priority from government
- G. Others _____

(To question 31)

29. If you have not received any support from government, the reasons

are _____ (multiple choice)

- A. I don't know the information
- B. I'm not exemplary enterprise
- C. They didn't recognise my potential to grow my business
- D. They have closer relationship with government,
- E. They got priority
- F. I didn't apply (I don't need these supports)
- G. I didn't apply (I'm afraid being constrained)
- H. Others _____

30. Compared with firms received government support, have you experienced any constraints for your operation? (multiple choice)

If yes, the reasons are _____ (multiple choice)

- A. Unfair market condition
 - B. Low brand recognition
 - C. More operate costs
 - D. Lower market share
 - E. No access to useful information
 - F. Others _____
- If no, the reasons are _____
- A. Market condition is fair
 - B. Market power is the main competition
 - C. The firm already got strong market reputation
 - D. Can get equal information as firms inside science park through agency
 - E. Can develop more flexible
 - F. Others _____

Part Six: Internationalisation

31. Is your firm international?

- Yes, at YEAR _____ I started to have trade internationally
- No (skip to question 35)

32. Why you decide to go international? (multiple choice)

- A. Encouraged by government policies
- B. It is the main characteristic of high-tech firms
- C. The merchandise is developed for foreign markets
- D. Stumble upon the merchandise is more popular in foreign markets
- E. Most of my counterparts do it
- F. Huge market potential and opportunities in global market
- G. There are one or more managers in my firm who have international trade experience
- H. There are one or more scientific staffs who studied or researched in foreign laboratories
- I. Lessened market in China
- J. I have sufficient capital
- K. I am not scared by the risks of expanding internationally
- L. Others _____

33. What barriers have you met?

	Very significant	Significant	Insignificant	Very insignificant	Neither
Shortage of working capital to finance exports	<input type="checkbox"/>				
Lack of abilities to identify foreign business opportunities	<input type="checkbox"/>				
Limited information to locate/analyse markets	<input type="checkbox"/>				
Inability to contact potential overseas customers	<input type="checkbox"/>				
Obtaining reliable foreign representation	<input type="checkbox"/>				
Lack of managerial time to deal with internationalisation	<input type="checkbox"/>				
Inadequate quantity of and/or untrained personnel for internationalisation	<input type="checkbox"/>				
Difficulty in matching competitors' prices	<input type="checkbox"/>				
Lack of assistance/incentives from home government	<input type="checkbox"/>				
Excessive transportation costs	<input type="checkbox"/>				
Difficulty in developing new products for foreign markets	<input type="checkbox"/>				
Unfamiliar with foreign business practices	<input type="checkbox"/>				
Unfamiliar with exporting procedures/paperwork	<input type="checkbox"/>				

Difficulty in meeting export product quality/standards/specification	<input type="checkbox"/>				
Others					

34. Do you receive any government support to promote internationalisation? (multiple choice)

- A. Export rebates
- B. Get a special fund from government
- C. Provide opportunities about international communication and cooperation
- D. Advanced information from government
- E. Encourage and help attend international trade show
- F. Provide opportunities for managers in firms to developed countries to have a trade study
- G. Chinese government that cooperates with foreign governments who help train the outstanding managers in high-tech SMEs
- H. Others _____ (Skip to question 36)

35. Why don't you expand to international market? (multiple choice)

- A. I'm discouraged by the stronger international competition
- B. I have no access to government support
- C. I don't know there is government support on international business
- D. I don't have enough financial capital
- E. I didn't realise any opportunities to go global
- F. I don't have a manager who have international trade experience
- G. I don't want to go global, no reason
- H. Others _____

36. In your opinion why Chinese firms hardly go to international markets?

	Very significant	Significant	Insignificant	Very insignificant	Neither
Home market is big enough to make profit	<input type="checkbox"/>				
Exhausted to survive in home market	<input type="checkbox"/>				
Most firms do not have a long-range planning	<input type="checkbox"/>				
The merchandises do not cater to the needs in foreign markets	<input type="checkbox"/>				
Believe it is harder to explore the international markets than survive in home market only	<input type="checkbox"/>				
The differences in culture, language and legal regulation	<input type="checkbox"/>				
Lower abilities on R&D compared with foreign merchandises	<input type="checkbox"/>				

R&D is mainly from learning and absorbing foreign technology	<input type="checkbox"/>				
Do not have competitive advantages compared with foreign firms	<input type="checkbox"/>				
Immature of financial institution (like Angel capital and VC), SMEs cannot get useful resources from them	<input type="checkbox"/>				
Shortage of working capital to finance exports	<input type="checkbox"/>				
Lack of abilities to identify foreign business opportunities	<input type="checkbox"/>				
Limited information to locate/analyse markets	<input type="checkbox"/>				
Inability to contact potential overseas customers	<input type="checkbox"/>				
Obtaining reliable foreign representation	<input type="checkbox"/>				
Lack of managerial time to deal with internationalisation	<input type="checkbox"/>				
Inadequate quantity of and/or untrained personnel for internationalisation	<input type="checkbox"/>				
Difficulty in matching competitors' prices	<input type="checkbox"/>				
Lack of assistance/incentives from home government	<input type="checkbox"/>				
Excessive transportation costs	<input type="checkbox"/>				
Difficulty in developing new products for foreign markets	<input type="checkbox"/>				
Unfamiliar with foreign business practices	<input type="checkbox"/>				
Unfamiliar with exporting procedures/paperwork	<input type="checkbox"/>				
Difficulty in meeting export product quality/standards/specification	<input type="checkbox"/>				
Others					

10.8 Appendix 8: Questionnaire (Final)

07.04.2014

Effects of Government Interventions on Chinese High-tech SMEs

A survey as a part of PGR study in University of Exeter in the UK

Please note: This survey is conducted as part of a PhD research at University of Exeter regarding the effects of government interventions on high-tech SMEs in China. The participation is completely voluntary and any the responses to this survey will be kept confidential. No access will be given to third parties. Data will be documented securely and analysed anonymously, and used for research purposes only.

If you have any queries about this survey, please contact Meiyong Chen at Exeter Business School:

Phone: 15711136787 (China)/00447429342466 (UK)

E-mail: mc406@exeter.ac.uk

Part One: Company Profile

1. Which industry does your firm belong to _____; what are the main products and/or services do you provide? _____
2. Please state the year of establishment (first legal incorporation) of your company: ____; Was your company founded as:
 - A. Independent new private enterprise (Natural Person Holding)
 - B. State-owned enterprise
 - C. Management buy-out
 - D. Management buy-in
 - E. Subsidiary of another Chinese firm
 - F. Subsidiary of another overseas firm
 - G. De-merger or spin-out from an existing Chinese firm
 - H. De-merger or spin-out from an existing overseas firm
 - I. Other (e.g. merger), please state: _____
3. What are the advantages of the organisational form of your company (see question 2)? (please choose relevant option(s) from lists below)

advantages

- Sufficient Financial Capital
- Strong Market Power
- Advantages in Accessing Information
- An Existing Network
- Abundant Human Resources
- Access to International Market
- Familiarity to Local Culture
- Government Support
- Achieved R&D facility or Technology
- Less R&D Costs
- Better Capability in Conducting Independent R&D
- Others _____

4. Is your firm a national-level high-tech firm? Yes ___ No ___
 Is your firm a Haidian-level high-tech firm? Yes ___ No ___

Do you consider/understand your company as a high-tech firm? Yes ___ No ___

To what extent do you think it is easy to be qualified as a high-tech firm?

Very hard Very easy

— — — —

Part Two: Economic Profile

5. How do you perceive general state of SME sector in China at the moment? (please tick the choice you make)

Very Weak Very Strong

— — — —

6. How strong do you perceive that the government support for SMEs in China? (please tick the choice you make)

Strongly ignored Strongly supportive

— — — —

7. In your opinion, what are the limitations of SMEs in China? (Indicate the strength of the limitation)

	Strongly agree	agree	disagree	Strongly disagree	Neither
Limited access to finance	<input type="checkbox"/>				
Lack of financial capital	<input type="checkbox"/>				
High taxation burden	<input type="checkbox"/>				
Strong competition from large firms	<input type="checkbox"/>				
Strong market competition from SMEs	<input type="checkbox"/>				
High market barriers	<input type="checkbox"/>				
Lack of human capital (management skills)	<input type="checkbox"/>				
Lack of technicians	<input type="checkbox"/>				

Inexperience in operating a firm	<input type="checkbox"/>				
Lack of networks	<input type="checkbox"/>				
Limited access to information	<input type="checkbox"/>				
Limited abilities to target potential market	<input type="checkbox"/>				
Lack of supports from government	<input type="checkbox"/>				
Lack of cooperation with suppliers	<input type="checkbox"/>				
Difficulty in finding premises	<input type="checkbox"/>				
Others					

Part Three: Business Start-up Conditions

8. What are the barriers for people to start a business?

	Strongly agree	agree	disagree	Strongly disagree	Neither
Financial limitation	<input type="checkbox"/>				
Lack of experience	<input type="checkbox"/>				
Lack of an favourable environment for entrepreneurship	<input type="checkbox"/>				
Lack of information and guidance	<input type="checkbox"/>				
Strong market competition	<input type="checkbox"/>				
High entrance barriers	<input type="checkbox"/>				
Monopoly/Oligopoly by large firms	<input type="checkbox"/>				
Monopoly/Oligopoly by stated-owned firms	<input type="checkbox"/>				

Complicated legal procedures	<input type="checkbox"/>				
Lack of access to advice and general support	<input type="checkbox"/>				
Lack of government support	<input type="checkbox"/>				
High taxation burden	<input type="checkbox"/>				
Others					

9. Do you think if the government is generally supportive to entrepreneurs willing to start up their own businesses? (please tick the choice you make)



10. Your start-up capital is mainly from:

- A. Self-raised funds (your reserves or borrowings from family or friends)
- B. Investment from State-owned firms
- C. Investment from government
- D. Bank loan
- E. Venture capital
- F. Angel fund
- G. Financing from other capitalists (please indicate _____)
- H. Others _____

11. After start-up stage, what sources do you access to for additional finance? (multiple choice)

	Already tried this way	Plan to use this way	Don't know yet
Equity financing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Venture capital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bank loans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government capital involved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Self-raised funds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Initial public offering (IPO)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others			

12. Is your firm located on a science park in Beijing?

- If yes: name of the science park _____; the year your firm moved in or founded in this science park _____; (To question No.13)
- No (skip to question No.16)

Part Four: Firms in and outside the Science Park

Firms in the Science Park

13. Why do you moved in or founded in this science park? (multiple choice)

- A. Originally located in nearby
- B. Better access to government support
- C. Better access to advanced information about policy tendency
- D. Better access to advanced information about market
- E. Better access to capital market
- F. To expand the network
- G. Rent is lower
- H. Housing subsidies
- I. Was attracted by Beijing hukou (registered permanent residence permission) quota
- J. Was attracted by cluster effect
- K. Just respond to the call of government
- L. Others_____

14. Do you think preferential policies give priorities to enterprises in the science park?

- If yes, the reasons are_____ (multiple choice)
 - A. Geographical concentration (not usually forgotten or ignored)
 - B. The science park has government background
 - C. The science park has strong connection with government
 - D. Advanced information (the science park passes information quickly)
 - E. Advanced information (get information from other firms in the same park)
 - F. Generally assumed as well-run firms
 - G. The science park could help remedy firms' limitations
 - H. Others_____
- If no, the reasons are_____
 - A. There exists competitive firms outside science park
 - B. Targets are all high-tech firms in Beijing
 - C. Did not feel the differences
 - D. Others_____

15. Do you think that firms in a science park perform better than firms outside a science park?

- If yes, the reasons are_____
 - A. Better access to government support
 - B. Advanced information: about the policy tendency
 - C. Advanced information: about market
 - D. Better access to finance
 - E. Expanded network
 - F. Lower rent fee
 - G. Housing subsidies
 - H. Science park can help remedy firms' limitations
- If no, the reasons are
 - A. Market demands are the main source for the development of firms
 - B. Firms outside of science park can also get essential advanced information
 - C. Firms outside of science park can also get access to governmental resources
 - D. Firms outside of science park can operate with more flexibility
 - E. Others_____

(To question 18)

Firms outside the Science Park

16. Why don't you consider moving to a science park? (multiple choice)

- A. Not familiar with science park
- B. Do not think joining in a science park will conducive to the development of firms
- C. Have enough resources to develop the firm (e.g. network, human capital or money)
- D. Consideration about geographic distance to main customers
- E. Consideration about geographic distance for employees
- F. Do not think as qualified to join in the science park
- G. Do not think there are any differences between operating firms in and outside a science park
- H. Discouraged by complicated applying procedures
- I. Others _____

17. Do you think preferential policies give priorities to enterprises in the science park?

- If yes, the reasons are _____ (multiple choice)
 - A. Geographical concentration (not usually forgotten or ignored)
 - B. The science park has government background
 - C. The science park has strong connection with government
 - D. Advanced information (the science park passes information quickly)
 - E. Advanced information (get information from other firms in the same park)
 - F. Generally assumed as well-run firms
 - G. The science park could help remedy firms' limitations
 - H. Others _____
- If no, the reasons are _____
 - A. There exists competitive firms outside science park
 - B. Targets are all high-tech firms in Beijing
 - C. Can receive the same information from government outside
 - D. Do not feel the differences
 - E. Others _____

Part Five: Government Support

18. Which government support do you think are conducive to the development of a high-tech SMEs?

	Very important	important	Unimportant	Very unimportant	Neither
Taxation relief	<input type="checkbox"/>				
External expertise	<input type="checkbox"/>				
Financial supports (providing free government investment)	<input type="checkbox"/>				
Financial supports (discounted interest on bank loans)	<input type="checkbox"/>				
Financial supports (research funds provided by government)	<input type="checkbox"/>				
Indirect financial supports (from venture capital that received governmental guiding funds)	<input type="checkbox"/>				
Housing subsidies	<input type="checkbox"/>				
Advice and guidance from government	<input type="checkbox"/>				

Support of internationalisation	<input type="checkbox"/>				
Training and education opportunities	<input type="checkbox"/>				
Advanced information that benefit development of firms	<input type="checkbox"/>				
Free or low cost infrastructure	<input type="checkbox"/>				
Others					

(In this part, if you get any support from government, please to 19, if you didn't get any support, please to 22)

19. What government support have you actually received? (multiple choice)

- A. Tax relief
- B. External expertise
- C. Financial supports (government investment)
- D. Financial supports (discounted interest on bank loans)
- E. Financial supports (research funds provided by government)
- F. Indirect financial supports (from venture capital that got governmental guiding fund)
- G. Housing subsidies
- H. Advice and guidance from government
- I. Support of internationalisation
- J. Training and education opportunities
- K. Advanced information that benefit development of firms
- L. Free or low cost infrastructure
- M. Others _____

20. As the result of specific support from government, what kind of benefits do you receive? (multiple choice)

- A. Increase in operation revenue
- B. Increase in R&D expenditure
- C. Increase in employment
- D. Higher level of brand recognition
- E. Increase in working capital
- F. Increase in market share
- G. Increase in business network
- H. Competitive advantages in market power against large firms and state owned firms
- I. Competitive advantages in market power against firms in the similar size
- J. Others _____

21. In your opinion, what is the reason for you to be chosen to receive government support? (multiple choice)

- A. Not many firms know the information
- B. My firm is an exemplary enterprise
- C. I have potential to grow my business
- D. I have close relationship with government, and got the priority
- E. I got advanced information from government
- F. I had priority from government
- G. Others _____

(To question 24)

22. If you have not received any support from government, the reasons are _____(multiple choice)

- A. I don't know the information
- B. I'm not exemplary enterprise
- C. They didn't recognise my potential to grow my business
- D. They have closer relationship with government,
- E. They got priority
- F. I didn't apply (I don't need these supports)
- G. I didn't apply (I'm afraid being constrained)
- H. Others _____

23. Compared with firms received government support, have you experienced any constraints for your operation? (multiple choice)

If yes, the reasons are _____(multiple choice)

- A. Unfair market condition
- B. Low brand recognition
- C. More operate costs
- D. Lower market share
- E. No access to useful information
- F. Others _____

If no, the reasons are _____

- A. Market condition is fair
- B. Market power is the main competition
- C. The firm already got strong market reputation
- D. Can get equal information as firms inside science park through agency
- E. Can develop more flexible
- F. Others _____

Part Six: Internationalisation

24. Is your firm international?

- Yes, at YEAR _____ I started to have trade internationally
- No (skip to question 28)

25. Why you decide to go international? (multiple choice)

- A. Encouraged by government policies
- B. It is the main characteristic of high-tech firms
- C. The merchandise is developed for foreign markets
- D. Stumble upon the merchandise is more popular in foreign markets
- E. Most of my counterparts do it
- F. Huge market potential and opportunities in global market
- G. There are one or more managers in my firm who have international trade experience
- H. There are one or more scientific staffs who studied or researched in foreign laboratories
- I. Lessened market in China
- J. I have sufficient capital
- K. I am not scared by the risks of expanding internationally
- L. Others _____

26. What barriers have you met?

	Very significant	Significant	Insignificant	Very insignificant	Neither
Shortage of working capital to finance exports	<input type="checkbox"/>				
Lack of abilities to identify foreign business opportunities	<input type="checkbox"/>				
Limited information to locate/analyse markets	<input type="checkbox"/>				
Inability to contact potential overseas customers	<input type="checkbox"/>				
Obtaining reliable foreign representation	<input type="checkbox"/>				
Lack of managerial time to deal with internationalisation	<input type="checkbox"/>				
Inadequate quantity of and/or untrained personnel for internationalisation	<input type="checkbox"/>				
Difficulty in matching competitors' prices	<input type="checkbox"/>				
Lack of assistance/incentives from home government	<input type="checkbox"/>				
Excessive transportation costs	<input type="checkbox"/>				
Difficulty in developing new products for foreign markets	<input type="checkbox"/>				
Unfamiliar with foreign business practices	<input type="checkbox"/>				
Unfamiliar with exporting procedures/paperwork	<input type="checkbox"/>				

Difficulty in meeting export product quality/standards/specification	<input type="checkbox"/>				
Others					

27. Do you receive any government support to promote internationalisation? (multiple choice)

- A. Export rebates
- B. Get a special fund from government
- C. Provide opportunities about international communication and cooperation
- D. Advanced information from government
- E. Encourage and help attend international trade show
- F. Provide opportunities for managers in firms to developed countries to have a trade study
- G. Chinese government that cooperates with foreign governments who help train the outstanding managers in high-tech SMEs
- H. Others _____ (Skip to question 29)

28. Why don't you expand to international market? (multiple choice)

- A. I'm discouraged by the stronger international competition
- B. I have no access to government support
- C. I don't know there is government support on international business
- D. I don't have enough financial capital
- E. I didn't realise any opportunities to go global
- F. I don't have a manager who have international trade experience
- G. I don't want to go global, no reason
- H. Others _____

29. In your opinion why Chinese firms hardly go to international markets?

	Very significant	Significant	Insignificant	Very insignificant	Neither
Home market is big enough to make profit	<input type="checkbox"/>				
Exhausted to survive in home market	<input type="checkbox"/>				
Most firms do not have a long-range planning	<input type="checkbox"/>				
The merchandises do not cater to the needs in foreign markets	<input type="checkbox"/>				
Believe it is harder to explore the international markets than survive in home market only	<input type="checkbox"/>				
The differences in culture, language and legal regulation	<input type="checkbox"/>				
Lower abilities on R&D compared with foreign merchandises	<input type="checkbox"/>				

R&D is mainly from learning and absorbing foreign technology	<input type="checkbox"/>				
Do not have competitive advantages compared with foreign firms	<input type="checkbox"/>				
Immature of financial institution (like Angel capital and VC), SMEs cannot get useful resources from them	<input type="checkbox"/>				
Shortage of working capital to finance exports	<input type="checkbox"/>				
Lack of abilities to identify foreign business opportunities	<input type="checkbox"/>				
Limited information to locate/analyse markets	<input type="checkbox"/>				
Inability to contact potential overseas customers	<input type="checkbox"/>				
Obtaining reliable foreign representation	<input type="checkbox"/>				
Lack of managerial time to deal with internationalisation	<input type="checkbox"/>				
Inadequate quantity of and/or untrained personnel for internationalisation	<input type="checkbox"/>				
Difficulty in matching competitors' prices	<input type="checkbox"/>				
Lack of assistance/incentives from home government	<input type="checkbox"/>				
Excessive transportation costs	<input type="checkbox"/>				
Difficulty in developing new products for foreign markets	<input type="checkbox"/>				
Unfamiliar with foreign business practices	<input type="checkbox"/>				
Unfamiliar with exporting procedures/paperwork	<input type="checkbox"/>				

Difficulty in meeting export product quality/standards/specification	<input type="checkbox"/>				
Others					

Thank you for your cooperation!

In order to thank responding companies for their assistance with this study, I will be sending out a summary report on the findings of our research. If you would like to receive a copy of the report, please indicate your address:

Name:

Company Name:

Address:

Telephone:

Fax:

E-Mail:

Please send the completed questionnaire to:

Chen, Meiyang

mc406@exeter.ac.uk

10.9 Appendix 9: Statistics

A7.10		Q7market	Q7inno	Q7entrep	Q7net	Q7Gov	Q8finance	Q8Entre	Q8Entre pervi	Q8net	Q8Mark	Q8gov	Q8tax
Q7finance	Pearson Correlation	.325**					.346**		.290**		.242*	.319**	
	Sig. (2-tailed)	0.001					0.001		0.005		0.018	0.002	
Q7tax	Pearson Correlation		.225*										.452**
	Sig. (2-tailed)		0.029										0
Q7market	Pearson Correlation		.248*		.241*		.312**		.270**		.445**	.218*	
	Sig. (2-tailed)		0.015		0.019		0.002		0.009		0	0.034	
Q7inno	Pearson Correlation			.297**	.412**		.255*						
	Sig. (2-tailed)			0.003	0		0.014						
Q7entrep	Pearson Correlation				.623**			.545**	.337**	.385**		.273**	
	Sig. (2-tailed)				0			0	0.001	0		0.007	
Q7net	Pearson Correlation								.260*	.355**			
	Sig. (2-tailed)								0.012	0.001			
Q7Gov	Pearson Correlation												
	Sig. (2-tailed)												
Q8finance	Pearson Correlation							.235*	.530**				
	Sig. (2-tailed)							0.024	0				
Q8Entre	Pearson Correlation							.384**	.265*	.239*	.360**		

	Sig. (2-tailed)							0	0.011	0.022	0
Q8Entrepenvi	Pearson Correlation								.330**	.281**	.349**
	Sig. (2-tailed)								0.001	0.007	0.001
Q8net	Pearson Correlation									.331**	.503**
	Sig. (2-tailed)									0.001	0
Q8mark	Pearson Correlation										.590**
	Sig. (2-tailed)										0

A7.15

Rank		N	Mean	Std. Deviation
11	Inability to Contact Potential Oversea Customers	90	3.4889	1.37591
12	Difficulty in Developing New Products for Foreign Markets	90	3.4000	1.18795
13	Unfamiliar with Foreign Business Practices	90	3.3778	1.17634
14	Limited Information to Locate/Analyse Markets	90	3.3222	1.32247

15	Inadequate Quantity of and/or Untrained Personnel for Internationalisation	90	3.3111	1.24200
16	Why Chinese Firms Hardly Go International: Home Market is Big Enough to Make Profit	90	3.1889	1.33992
17	Do Not Have Competitive Advantages Compared with Foreign Technology	90	3.1778	1.25937
18	Lack of Managerial Time to Deal with Internationalisation	90	3.1333	1.11375
19	Obtaining Reliable Foreign Representation	90	3.1333	.99662
20	Lack of Assistance/Incentives from Home Government	90	3.1111	1.09590
21	Difficulty in Matching Competitors' Prices	90	3.0222	1.16095
22	Excessive Transportation Costs	90	2.9222	1.20138
23	Difficulty in Meeting Export Product Quality/Standards/Specification	90	2.9000	1.17129
24	Unfamiliar with Exporting Procedures/Paperwork	90	2.9000	1.16165