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# Access to Finance in Beijing

Dissertation submitted for the degree of Doctor of Philosophy

Jia Wang

Durham University  
Durham, United Kingdom

October 2011

## Abstract

This dissertation examines the accessing of finance by entrepreneurs in the Beijing area of China using a bespoke survey of 452 entrepreneurs which was gathered by the researcher. Human capital theory along with theories of finance such as the pecking order theory, and agency theory provide the theoretical contextualisation of the research. Within human capital theory, innovation is the key variable which is investigated. Innovations in: (i) products, (ii) processes, (iii) work practices or workforce organisation, (iv) supply and supplier relations, (v) markets and marketing, (vi) administration and office systems, and (vii) product distribution are investigated which allows a comprehensive study which is more faithful to Schumpeter's earlier writings.

Chapter 1 provides an overview of the research. Chapters 2 will provide the theories of entrepreneurship. The companion chapter 3 will provide a review of the theories of finance and empirical studies of access to finance by small businesses. Chapter 4 completes the triumvirate and overviews credit rationing and constraints. Chapter 5 details the methodology used in the rest of the dissertation and the data set which was gathered by the researcher.

The empirical contribution of the dissertation is presented in chapters 6 to 8. In each of the three empirical chapters the key focus of attention is upon seeing whether innovators fair worse, and are disadvantaged in comparison to their non-innovating counterparts. This analysis includes bivariate analysis and then multivariate regression techniques which allow innovation to be investigated in models which simultaneously controls for the characteristics of the businesses and the entrepreneurs.

Chapter 6 investigates the use of sources of finance at the start-up stage of the businesses. Chapter 7 investigates the applications for external finance, whether or not the finance was successfully accessed, and also the levels of awareness of sources of finance. Chapter 8 investigates the amount of external finance sought, the amount of external finance received and the ratio of sought to received external finance.

Chapter 9 concludes the dissertation on the access to finance in Beijing. In this chapter a summary of the dissertation findings will be presented. Additionally, the chapter will provide a series of discussions on the implications of the empirical results for theory, practitioners, government, policy and the entrepreneurial and small business community in Beijing, China, and beyond.

## **Preface**

This dissertation is the result of my own work and includes nothing which is the outcome of work done in collaboration. This dissertation does not exceed 100,000 words.

This dissertation is not substantially the same as any other I have submitted for a degree or diploma or other qualification at any other university. I further state that no part of this dissertation has been or is being concurrently submitted for any such degree, diploma or other qualification.

**Jia Wang**

## **Statement of copyright**

The copyright of this thesis rests with the author. Due acknowledgement must always be made of any material contained in, or derived from this thesis.

In spite of the teamwork which has produced this thesis, I take ultimate responsibility for any outstanding errors of omission and commission.

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## **Chapter 1:**

### **Introduction and Overview**

#### **1.1 Introduction**

There has been a substantial amount of previous research which has explored and attempted to quantify the prevalence of credit rationing to small businesses in developed nations (Miller, 1962; Jaffee and Russell, 1976; Stiglitz and Weiss, 1981; Levenson and Willard, 2000; Russo and Rossi, 2001; Beck, 2007; Blumberg and Letterie, 2008). However, there has been substantially less research into credit rationing in developing or emerging nations (Baydas et al., 1994; Pruteanu, 2004; Wu and Tan, 2005; Okurut et al., 2005) and within this area of research there are comparatively few studies where the entrepreneur is the unit of analysis when investigating businesses' access to finance, and where a quantitative econometric methodology has been adopted. In order to increase our understanding of credit rationing and access to finance, this study utilises a bespoke set of data from entrepreneurs in Beijing, China. The study has several implications for small business research and also practitioners and policy makers, as well as entrepreneurs and would-be entrepreneurs in both Beijing and other regions of China.

The objective of this study was to investigate the extent to which, over the 3 years between 2004-2006, entrepreneurs who were owners and the main decision makers of small businesses with up to 500 employees in Beijing were able to access external finance, particularly bank finance, which they required for working capital and long-term investment projects. Particular attention is paid to human capital theory and whether there are differences between innovators and non-innovators in terms of access to finance in the following areas. Firstly, the utilisation of sources of

finance at the start-up stage, which is explored in the first empirical chapter. As China moves to become a more completely free market economy, it is important to see the take up rate or prevalence of each of the possible sources of finance at the start up stage.

Secondly, applications for external finance by source, and whether or not the applications were successful by source, and the levels of awareness of sources of finance, which are analysed in the second empirical chapter. Again it is important within the context of a radically changing economy to identify to which sources of finance the entrepreneurs are actually making applications and the extent to which they are successful. Finance is the life blood of any business and hence it is important to gauge the success and failure rates of attempts to seek external finance. However, hand in hand with the aforementioned, it is important to see to what extent entrepreneurs are aware of each of the full portfolio of financial providers in China. Such information will be important to entrepreneurs and policy makers alike.

Thirdly, the percentage of money received from that sought, the amount of money sought, and lastly, the amount of money received. This companion set of analysis takes the research forward by looking at external finance collectively. There is very little previous research which has not only quantified the amount of external finance sought and received in local currency terms, but also as a relative ratio. This allows us to see the demand for external finance and the extent to which entrepreneurs get a high, or a low proportion of the finance sought.

These objectives are pursued within a quantitative research methodology of a large-scale study of entrepreneurs in Beijing. A large sample allows the utilisation of sophisticated econometric models to establish whether or not there are differences

between innovators and non-innovators; also the extent to which other characteristics of the entrepreneurs and the businesses are important variables.

There has been much debate upon what constitutes a small and medium sized enterprise (SME), and in particular what is the appropriate upper size limit (Storey, 1994). In the UK, an SME has an official upper size limit of 250 employees, but other scholars such as the Cambridge researchers Cosh and Hughes have continued to use 500 employees as an upper limit. However, in China, there is no standardised figure. An SME can have an upper limit of up to 2000 employees in industrial sectors, 3000 employees in building industries, 500 employees in retail and wholesale industries, 3000 employees in transport and logistics industries and 800 employees in hospitality industries (Law of the People's Republic of China on Promotion of Small and Medium-sized Enterprises, 2003) <sup>1</sup>. In order to allow more meaningful comparisons with previous western studies and at the same time tempering the abundance of labour in China, it was decided to put 500 employees as the upper limit.

This is the overall introduction chapter of the dissertation. Section two provides a brief overview of the contributions of small businesses to China. Section three informs the reader of the development of entrepreneurship in China over the last three decades. Section four presents the focus and purpose of the study. Finally, section five presents the dissertation structure and that completes the chapter.

---

<sup>1</sup> On 29<sup>th</sup> June 2002, President JIANG Zemin pronounced: "The Law of the People's Republic of China on Promotion of Small and Medium-sized Enterprises, adopted at the 28th meeting of the Standing Committee of the Ninth National People's Congress of the People's Republic of China, is hereby promulgated and shall go into effect as of 1<sup>st</sup> January 2003."

## **1.2 The Contributions of Small Businesses to China**

There is a lack of consensus upon the exact economic and non-economic contributions provided by entrepreneurs and new businesses in developed nations (Johnson, 2007). There is a similar debate raging on developing or emerging nations particularly China which is the focus of this study (Van Stel et al., 2005). With the launch of the 'open door' policy in 1978, China made a great leap forward from the previous planned or command economy, and throughout the 1990s and through the first decade of the new millennium the People's Republic of China has enjoyed unprecedented growth and become a much more market based society (Peng, 2000; Li and Matlay, 2006; Zhou and Li, 2007; Li et al., 2009; He, 2009). Clearly, entrepreneurs and small businesses have an important role in continuing this economic development (Carree et al., 2007).

In a nation of over one billion people (the population of China was 1.32 billion at the end of 2008) where labour is abundant and employment creation is a challenge for the Chinese government, entrepreneurial small businesses clearly have a part to play in reducing unemployment, creating jobs and alleviating poverty (Storey, 1982; 1994). Moreover, entrepreneurial businesses are catalysts for wealth creation and the businesses, entrepreneurs and employees alike can provide tax revenue for the Chinese government for policy initiatives to continue development and advancement. Moreover, small businesses are seen as the seedbeds from which future large businesses will grow. Such businesses would provide a welcome substitute and / or replacement for the state owned enterprises which have had to rationalise employment in the period in which private ownership of the means of production has again returned to China.

### **1.3 The Development of Entrepreneurship in China during the Last Three Decades**

Chinese private businessmen have been cautious ever since the disastrous events of the 1950s that liquidated all individual and private businesses, despite the continuing assurances and enforcement of property rights since then (Guthrie, 2009). Moreover, they probably have good enough reasons to fear political and policy changes during economic reforms, as the central government maintained an ambiguous attitude towards problems related to private property and corporate ownership rights (Cong, 2009). In addition, the Constitution of 1988 grants the state the power to exercise guidance, supervision and control over the private sector of the economy (Zhang, 2008). However, “only the capable and flexible Chinese were able, without fuss, to give up the nearly sanctified standpoints of an ossified Communism and Marxism and to reconstitute the system according to market economy and entrepreneurial principles (Kraus, 1991 pp.21)”.

Chinese economic reform began in the 1980s and the reconstruction of the private sector set in motion a remarkable process of re-stratification and development. Emphasis on this was reported at the XIII<sup>th</sup> Congress of the Chinese Communist Party in October 1987 by Zhao Ziyang, who at the time was Secretary General of the Central Committee of the Party and he stated: “the sole criterion for the economy is not its level of public ownership, but the level of its productivity.” In order to promote productivity, he also said: “the State should encourage the non-public sector of the economy, that is the private sector, to expand (Zhao, 1987 pp.5)”.

Even though China was reluctant to pass legislation to protect private property in the 1980s, due to the sensitive nature of the term “Private Ownership”, courageous, hard working entrepreneurs took the plunge and became the driving force of economic development (Peng, 2000). Unfortunately, because China had operated as a planned economy for decades before the economic reforms kicked in, the debilitating nonchalant attitudes and the lack of efficiency in organizations had impeded the development of entrepreneurship in China to a significant degree (Zapalska and Edwards, 2001; Zhou and Li, 2007). Given the low level of managerial skills of the decision-makers within Chinese enterprises even today, there is still large scope for improvement in terms of organizational capabilities in order to enhance the performance of the Chinese private sector (Li et al., 2009). Having said that, the successes that have been achieved by these small and medium sized enterprises (SMEs) so far and the contributions they have made to the Chinese economy should be highlighted.

The 1990s was a period of booming activity for SMEs and entrepreneurship in China. Utilising a broad definition, there are currently about 40 million SMEs in China and they have accounted for approximately 99%, 60%, 40% and 60% in total numbers of enterprises, turnovers, official tax income and exports, respectively. SMEs are not only employing 75% of the labour force, but also creating almost 90% of the new jobs (National Administration of Industry and Commerce, 2003). It is well documented that SMEs have become a major driving force in China’s unique brand of economic growth (Li and Matlay, 2006). It needs to be noted that 85% of SMEs are private firms, among which 15.2% are technology-based enterprises (China SMEs Yearbook 2000; Jiang, 2007). Without doubt, SMEs are playing and will continue to play a vital role in the national economy.

As can be seen in figure 1.1, with average annual growth rate at 11%, the absolute number of enterprises increased from 18 million to 38 million in the short period of just 10 years. The designer of Chinese reform and opening-up, Deng Xiaoping, when he visited South China in 1992, provided both firm assurance for the principles of a market economy and significant encouragement to private entrepreneurs (Guthrie, 2009). Thereafter, private sector funds were invested with more confidence and from the institutions' point of view, bank loans were released relatively easier. Hence, the dramatic growth results until 1995 confirmed an ever stronger willingness for development from top to bottom. However, the pressure from an obviously inflated currency forced the Chinese government to intervene in order to keep the economic heat and inflation rate under control (Yu, 2001). Actions such as the strictly controlled size of loans and a tight monetary policy made the financial environment rather tense for entrepreneurial firms (Gao, 2002).

**Figure 1.1:** The change in number of small firms 1990-1999

Year	Small firms *(1M) (1)	Individually owned ** (1 M) (2)	(3) = (1)+(2)	Numbers of start-ups per year (1M); (4)= (3)Y <sub>n+1</sub> - (3)Y <sub>n</sub>
1990	4.64	13.28	17.92	—
1991	4.86	14.17	19.03	1.11
1992	5.91	15.34	21.25	2.12
1993	7.50	17.67	25.17	3.92
1994	8.25	21.87	30.12	4.94
1995	8.42	25.28	33.70	3.59
1996	8.21	27.04	35.25	1.55
1997	7.72	28.51	36.23	0.98
1998	6.75	31.20	37.95	1.72
1999	6.52	31.60	38.12	0.17

Data sources: \* Chinese SMEs Yearbook (2000); \*\* Collection of industrial and commercial management Statistics (1991–1998), Office of State Administration of Industry and Commerce. Forty-Year Statistics of Administration of Industry and Commerce of China, China Statistics Press.

*(Also quoted in Gao, 2002)*

Peng (2004) asserted that whether a formal institution can achieve the desired results depends to a large extent on whether it is supported by informal institutions such as customs, traditions and codes of behaviour. The author would always stand by the argument of preserving the essentials of cultural independence and many worthy aspects of the great heritage of China (Kraus, 1991). The conjunction of a sound market-based economic system and pride in their heritage is the all important driving force behind the actions of individuals (including entrepreneurs, employees, policy makers and any stakeholders) which eventually result in economic activities.

The Chinese private sector has entered an affluent and flourishing era since 2000. By that year, private enterprises already employed 30% of the Chinese labour force and contributed 40% to the national output (National Bureau of Statistics of China, 2000). The newest figures available to the researcher, for 2007, revealed that private enterprises in China were growing at a rate of more than 20% per annum and contributing 70-80% of the annual national GDP growth (China Xinhua News Agency, 2007). In more developed regions offering favourable business environments to entrepreneurs, for instance along the southern coast of China, including Zhejiang province, the average private sectors' output comprises 65% of the total regional GDP (He, 2009). The Global Entrepreneurship Monitor Study (2007) measured the percentage of adults aged between 18 to 64 who had been involved in new ventures as an indication of the population's prevalence in entrepreneurship. The results show that China was ranked first in the world. In view of the surprising but encouraging result, it is obvious that Chinese entrepreneurs are providing fuel to the enormous engine of China's economic growth. This view draws our attention to the most important men and women of this thesis, the Chinese entrepreneurs.

### **1.3.1 The background of Chinese entrepreneurs**

As summarised in Peng's (2000) book, the very complex population of entrepreneurs can be simplified into four groups whose members have similar backgrounds. These four groups are farmers, "gray" individuals, cadres of former government officials and professionals. His coverage might not be fully comprehensive, yet it certainly identified typical characteristics of each type of entrepreneur and therefore gave us clues to the business activities they performed, strategies they were likely to undertake and networking approach they adopted. It is important that the reader is aware of these distinct types of Chinese entrepreneurs. However, in this dissertation the selection of the entrepreneurs was not based upon these four types of background. Further clarification is provided in the Methodology Chapter.

#### **1.3.1.1 Farmers**

Farmers are considered to be a long-standing entrepreneurial force in China. The reason for this is that their substantially disadvantaged social and financial position, compared to industrial workers in the early days of China, denied them a sense of security in the stable orbit of state socialism, and therefore, they relied more on themselves or family members. Gradually, some of them became organised and attempted to grow beyond their family holdings. The Hope Group is the largest private company currently in China with an annual turnover exceeding \$20 million and specialises in animal feed, vegetables, meat, and food processing (Au and Sun, 1998; Peng, 2000). Its success is a direct consequence of the Chinese farmers' steady, hard-working nature and the land and food shortages China will always face bearing

in mind the size of its population (Choe et al., 1996; Nee, 1989; 1991; Peng, 2000). Overall, despite the size of successful farmers' companies which can grow into firms as big as the Hope Group, they are in society still less visible to urban entrepreneurs. To an extent, the consistent and unassuming nature of the entrepreneurial farmers is also revealed.

### **1.3.1.2 “Gray” individuals**

To discuss “gray” entrepreneurs or even to define them is a difficult and troublesome task. However, most of them nowadays are indeed entrepreneurs in the classical sense as asserted by Burt (1997 pp.342): “Persons who add value by brokering the connection between others.” Typically, they make good use of their wide social networks to gather insider information (which is superior to publicly available information) from parties who either actively or passively are involved in a transaction to discover and exploit entrepreneurial opportunities (Peng and Heath, 1996; Peng, 2000). Valuable information can be collected but is not limited to sources such as finance institutions, the government, foreign investors and local investors. The characteristics of, if we prefer, the colour of “gray” entrepreneurs in China, is not so radical and extreme as the frequently criminal behaviour of entrepreneurs in Russia in the 1990s, but instead it is more akin to those entrepreneurs who were more involved with policy or who took advantage of legal loopholes (Batjargal, 2007).

To them, the law is only ‘black and white’ on paper, but when it comes to the interpretation or enforcement, the law becomes grey (Liu, 2005). Because of the fact that “gray” entrepreneurs often built up their “empire” from nothing and went through extremely hard times in their lives, psychologically, they tend to have a strong belief

that they can control their own fate and are more willing to take risks and deal with the ambiguities within the Chinese system (Peng 2000).

### **1.3.1.3 Cadres of former government officials**

From a strategic point of view, together with the privatisation of State Owned Enterprises (SOEs), cadres in special positions have the incentive to set up businesses and therefore conveniently to take advantage of state property, or to put it bluntly, to steal from the state or from the people, as per communism (Chen et al., 2006). They not only maintain extremely good relationships with their colleagues in order to be able to access valuable information and resource in the government, but it is also common that they are part of the society of the “gray” economy (Rashid, 1997). Thus, in China, the power of these ties acts as social capital, the value of which is almost impossible to calculate.

Peng (2000 pp.174) said that: “They can be better viewed as rational, opportunistic individuals driven by strong self-interest.” However, as the economy progresses more and more towards a market-based one, the already small number of cadre-entrepreneurs will in fact diminish further.

### **1.3.1.4 Professional**

As soon as the economic climate improved and the education system was back in order after the damaging 10-year Cultural Revolution, more and more professionals joined the ranks of entrepreneurs. They should be and are indeed widely supported and encouraged by the government, as well as by the general public. Entrepreneurs

from professional backgrounds are considered to be virtually the ultimate fuel for the development of the private sector in China. Controversially, the occupational surveys of Chinese private enterprises carried out by the Department of United Front of the Central Committee of the Chinese Communist Party (CCP) of 1993 (11.1%), 1997 (3.9%), 2000 (10.4) and 2002 (3.8%) show a trend of huge fluctuations in terms of the proportion of the total number of entrepreneurs that is made up by qualified professionals. These proportions are included in parentheses in the previous sentence. Chen et al. (2006) suggested one explanation for the sudden changes, that of being due to a possible trade-off effect of choosing and balancing between the prestigious status of being a business owner versus the loss of security, power and resources of having a professional career. However, as with all entrepreneurs, the real motives of this specific group of entrepreneurs is hard to identify, as is the scale of their sustainability, in light of the historical fluctuations reported above.

To sum up, the Chinese version of the market economy concept does not equate exclusively with Western capitalism and certainly departs from traditional socialist thoughts. The already embedded social and organisational structures and local cultures are simply the rules to follow. It is argued by Gibb and Li (2003 pp.417) that “highly decentralised structures allowing differentiation, complexity and associated ambiguity may be a necessary condition for substantial stimulation of MSME (Micro, Small and Medium Sized Enterprise) development.”

#### **1.4 The Focus and Purpose of the Study**

This study has explored the prevalence of credit rationing in Beijing. The key emphasis has been to see whether innovating businesses compared to non-innovating

businesses are able to access external finance. More specifically, this study has extended research beyond previous studies by utilising a broader range of types or facets of innovation, beyond the narrow areas of product and process innovation which has received a disproportionate amount of attention, and applying this to access to finance. Another aim in pinpointing different types of innovation in this study which is pertinent to a Chinese audience is to purposely raise the awareness of the areas in business where innovative activities can be exercised, that are outside the more traditional and restricted viewpoint of innovation. It is clear that the fulfillment of this aim makes practical sense to Chinese entrepreneurs, practitioners and policy makers and benefits the society as a whole.

The focus with regard to innovators and non-innovators and access to finance centres upon a) the utilisation of sources of finance at the start-up stage, which is explored in the first empirical chapter, b) applications for external finance by source, and whether or not the applications were successful by source and the levels of awareness of sources of finance, which are analysed in the second empirical chapter, and c) the percentage of money received from that sought, the amount of money sought, and lastly, the amount of money received.

The study aimed to collect and explore an adequate data set, designed in a robust manner, where the number of harvested questionnaires would be of sufficient size to make the analysis statistically robust. The primary data used in this study comes from a survey of businesses with up to 500 employees located in Beijing. Databases of two local Inland Revenue Offices were used as a sample framework. After slimming down numbers of firms to be surveyed according to the selection criterion, three batches of surveys, totalling 1200 questionnaires were identified. Liaising with the Inland Revenue officials, the researcher sought clarification of who

the owner or main decision-maker was in the business. Because of the range and depth of the questions asked in the survey and the quality of the responses, the researcher was reasonably convinced that the decision-maker was the person who actually completed the questionnaire.

The 1200 questionnaires were sent to the short-listed entrepreneurs. During the six month survey, 457 responses were received, of which 5 were unusable as the numbers of employees in the business exceeded the 500 employee upper limit and so were eliminated. To ensure the quality of the responses, a telephone line was available for questions from the respondents during business hours and a series of telephone prompts, which not only helped to boost the response rate but also offered opportunities to clarify ambiguities which may have existed. Due to the sensitivity of the survey questions, crucial figures were cross-checked with the database that is held at the local Inland Revenue Offices to verify the validity, reliability and authenticity of the respondents. Implicit within this approach is checking that the respondent entrepreneur is the owner or the decision-maker in the business. A healthy response rate of 37.67% was achieved. This rate is considerably higher than similar studies on finance and entrepreneurship or small businesses (Storey, 1994). The final sample consisted of 261 manufacturing and 191 service sector firms.

## **1.5 Dissertation Structure**

This dissertation is organised into five parts, made up of nine chapters. Part two contains three chapters. Chapter two will provide the theories of entrepreneurship. The following companion chapter will provide a review of the theories of finance and empirical studies of access to finance by small businesses and

chapter four overviews credit rationing and credit constraints. Taken together, chapters two to four provide the theoretical underpinnings of the thesis relating to entrepreneurship and to access to finance, as well as the identification of the relevant and pertinent previous studies which have had a strong bearing upon how the researcher identified the research gaps which this thesis is alleviating. Part three consists solely of chapter five, the methodology chapter. This provides the stepping stone to allow the mechanisms of the study. Part four comprises three empirical chapters which are a blend of bivariate and multivariate regression analysis. These chapters provide the bulk of the new contributions of the thesis. Part five, chapter nine, provide the concluding chapter.

Chapter two will provide the theoretical framework from entrepreneurship and small business research. Following an introduction, the chapter will review human capital theory, with particular attention placed upon the specific human capital of innovation. The chapter also elucidates social capital theory and the limitations concerning the collection of empirical evidence for social capital theory for this study.

Chapter three presents the core theoretical material on finance. It examines the market efficient hypothesis and then moves to present issues revolving around asymmetric information issues and agency theory. Then the capital structure is examined, with or without taxation and an extended discussion about possible determinants is also included in the exposition. After the access to both internal and external sources of finance are explained, the dissertation moves on to present the pecking order theory, which has endeavoured to order sources of finance by preference. An illustration of policy influences and various financial support from the Chinese government to small businesses in China completes the chapter.

Chapter four develops the material presented in the previous chapters, and focuses upon exploring credit constraints and credit rationing with particular reference to the possible financial constraints and difficulties which can be encountered by entrepreneurs and small business in Beijing. The phenomenon of credit rationing is discussed with particular attention to market anomalies which result from information asymmetry and the problems of adverse selection and moral hazard. The Stiglitz and Weiss (1981) position on credit rationing is then illustrated and is tempered against the various criticisms which were raised against the model and which have provided an impetus to take the theory forward. The discussion progresses to relationship lending and the importance of collateral in lending decisions. The literature on previous empirical research on credit rationing, particularly in developing and emerging nations, completes this chapter.

Chapter five presents the methodology, the reasoning behind the choice of research methods adopted and the actual research itself which has been applied in subsequent chapters. The chapter provides the reader with an outline of the time frame of the study, as well as the theoretical structure which has been utilised. Additionally, the reasoning for the researcher adopting a quantitative rather than a qualitative research methodology, why the survey was chosen as the method of data collection and why Beijing was selected to be the geographical location of the study is covered. The selection of the sample and some of the reasons why other available methods were not used, are presented in section five. This then leads to providing insights into the data collection instruments and, in particular, the creation of a quantitative survey. Section seven indicates the measures of the variables to be utilised in the empirical chapters. It is important to pilot and test questions and surveys and section eight overviews the steps which were undertaken to ensure that,

as far as humanly possible, the questions and the data which has been harvested are safe and robust, and that the results are valid. Section nine indicates the difficulties encountered in getting responses back. This is followed by the data presentation and analysis steps which needed to be taken on board before undertaking the empirical analysis in chapters six to eight. The problems encountered in undertaking the fieldwork are also presented

Chapter six is the first of three empirical chapters. This chapter has the objective of analysing entrepreneurs' access to start-up capital and the influence of innovation in accessing start-up capital in Beijing. The chapter provides a combination of cross-tabulation analysis of the innovation and control variables of the businesses and the entrepreneurs against the use of start-up finance, and the mean percentage of start-up finance by source. This is complimented with multivariate regression analysis which allows the influence of innovation upon start-up finance to be examined within models while controlling simultaneously the control characteristics of the businesses and the entrepreneurs.

Chapter seven commences with a detailed overview of the overall levels of applications for external finance – by source, and bivariate analysis against innovation and the control variables which capture the characteristics of the businesses and the entrepreneurs. This is followed by analysing whether firms were successful in their applications for external finance and utilises the same bivariate methodology which was applied to applications for finance. The third strand of the bivariate analysis looks at the awareness of external sources of finance. This allows the reader to have a good grasp of the applications for external finance, whether or not these applications were successful, and also the awareness of the range of external sources of finance. Subsequently the analysis is taken forward by applying econometric model techniques.

In chapter eight, the analysis moves on to investigate the demand and the supply of credit in Beijing using a sub-sample of 384 firms (those who had applied for external finance). In practical terms, the chapter explores the relationship between innovation and the control characteristics of the businesses and the entrepreneurs against: (i) the amount of external finance sought, (ii) the amount of external finance received, and (iii) the ratio of 'sought' to 'received' external finance. As with the previous chapter six, on sources of finance at start-up, chapter eight again utilises a blend of cross-tabulations and multivariate regression analysis. The cross-tabulation analysis presents bivariate results of the characteristics of innovation and the control variables against the three measures of finance indicated above. The multivariate regression analysis involves the applying of tobit regression techniques to the percentage of finance received from that sought, and OLS regression models of the amount of money sought, and the amount of money received.

Chapter nine concludes the dissertation on the access to finance in Beijing by small businesses. In this chapter, a summary of the dissertation findings will be presented. Additionally, the chapter will provide a series of discussions on the implications of the empirical results for theory, practitioners, government, policy and the entrepreneurial and small business community in Beijing and where applicable throughout China.

## **Chapter 2:**

### **Human Capital, Social Capital and Innovation**

#### **2.1 Introduction**

Shane and Venkataraman (2000) emphasised two related processes that signify the existence of entrepreneurship, which are the discovery of entrepreneurial opportunities and the exploitation of such opportunities (specifically referred to an opportunity that had been acted upon rather than just contemplated). We know very little about specific qualities of the entrepreneur or the firm or any social process that may enhance the ability to discover and accomplish opportunities. Therefore, a direction is given to researchers to make sure they perform studies to build sound empirical longitudinal observations leading to better understanding of both human and social capital that can influence entrepreneurial activities (Davidsson and Honig, 2003). There is a lack of studies focusing on the entrepreneur as the unit of analysis to assess small businesses' financing problems, and studies where a quantitative research approach has been adopted.

The argument that firms founded by entrepreneurs with greater human capital outperform others is not new in the literature and there is evidence to support relationships between the founders' human capital and the likelihood of firms survival and growth (Gimeno et al., 1997; Colombo and Grilli, 2005). "Successful exploitation of a new business opportunity generally requires the integration of complementary context-specific knowledge" (i.e. technological, managerial and/or marketing knowledge) (Colombo and Grilli, 2005 pp.800), which are precisely parts of individuals' human capital.

A distinction is made in the literature to split human capital into two domains: *general* (sometimes also referred to as *generic*) human capital and *specific* human capital. Human capital theory is by far the most intuitive and well-established theory upon which it is suitable to base a wide variety of research projects (Ucbasaran et al., 2004). Human capital theory highlights the core of entrepreneurship, the entrepreneur, therefore it is specifically appropriate as the basis for entrepreneurship research, offering a wide selection of usable variables. (Westhead and Wright, 1998; Ucbasaran et al., 2003; Westhead et al. 2005a; 2005b).

Furthermore, entrepreneurs' human capital influences the likelihood of obtaining outside finance (Westhead, 1995). It is recognised that high human capital individuals are more competent to escape financial constraints and carry on developing the firm to benefit the economy as a whole. As the investigation into the possible difficulties encountered by entrepreneurs in gaining access to finance is the main objective of this study, the researcher is keen to base her research on human capital theory and feels confident that this is the most sensible route to take from designing to accomplishing the whole research project. Drawing on earlier insights on the relationship between R&D, innovation and firm value from Schumpeter (1934) and Griliches (1981), human capital has long been recognised as the engine of innovation and sustainable growth of a firm (Romer, 1990; Aghion and Howitt, 1998; Nelson, 2005; Messinis and Ahmed, 2009). The 'technological and value dimensions of an innovation' is a particularly useful indicator of the integration of the 'cognitive skills' and the 'market value' of human capital resources possessed by a firm (Lanjouw and Schankerman, 2004 pp.443). It then offers possibilities to scholars to obtain new estimates of human capital as a latent factor through assessments of the

innovativeness of a firm and make 'valuable cognitive skills' identifiable (Hanushek and Kimko, 2000; Messinis and Ahmed, 2009).

Innovation as the knowledge-intensive side of economic activity and as one of the fundamental elements of entrepreneurship will be addressed with relation to human capital theory. In fact, innovation stems from human capital reserves conditional on the availability of finance to facilitate innovative projects (Westhead and Storey, 1997). An innovators' borrowing pattern "reflects an aggressive attempt to innovate and forge ahead in high technology markets where development costs are high" (Oakey, 1984 pp.116). Because the cost of external financing is considerably greater than the opportunity cost of internally generated funds, resorting to the latter type of capital becomes an apparently sensible choice for entrepreneurs taking into consideration the limited ability of innovators to convince lenders to release funding (Fazzari et al., 1988).

Putnam (2000) defined social capital as the connection between individuals, their social networks, their norms of reciprocity, and the existence of trust to maintain such connection. Similarly, Cohen and Prusak (2001) described social capital as a mechanism to bring people who bear mutual understanding and shared values together and to bind the group. In spite of different versions of the definition of social capital (Arrow, 2000; Keefer and Knack, 2005; Knight and Yueh, 2008), it is generally agreed that there are numerous benefits to an entrepreneur who has a high level of social capital in areas such as access to information, knowledge acquisition, market influence and control, opportunity discovery, and so forth (Burt, 1992; Shane and Venkataraman, 2000; Cohen and Prusak, 2001; Adler and Kwon, 2002). The quality, relevance and timeliness of information transferred through social networking are critical to entrepreneurial activities (Coleman, 1988; Powell and Smith-Doerr,

1994; Uzzi, 1997; Podolny and Page, 1998), particularly in the context of a transitional economy (i.e. China) where asymmetric information often directly translates into business opportunities. The connection culture of China, also called “Guanxi” is well known to the western world (Park and Luo, 2001; Knight and Yueh, 2008; Anderson and Lee, 2008). As a matter of fact, firms’ survival and success are hugely dependent on the entrepreneur’s social capital in China (Xin and Pearce, 1996; Luo and Chen, 1996). It is therefore worthwhile to study social capital theory from the Western perspective, as the views would be more objective.

The chapter is organised as follows. The review of the human capital theory and the proxies that are to be included in the survey are discussed in detail in section two. This is followed by an extensive discussion of innovation in relation to human capital theory, and then the subject moves onto the measures of innovation, as well as some financing issues which specifically can apply to innovative firms. Thirdly, social capital theory is reviewed to offer a different aspect of the views of the benefits and risks associated with social capital. Finally, a brief review of the development of entrepreneurship in China in the last two and a half decades finishes the main part of the chapter. This part of the dissertation focuses light upon the uniqueness and worthiness of pursuing entrepreneurial studies in China, and it is also the motive behind this research project. A conclusion then completes the chapter. This is a precursor for the reader of the next literature review chapter, which is devoted to covering the theories of finance.

## 2.2 Human Capital Theory

Human capital is the capital that belongs to a person or a group of people and it bears a sense of accumulation through time (Wang and Yao, 2003). In entrepreneurship, scholars considered human capital as “inputs” of an individual into a business in exchange for “outputs” such as the decision to become self-employed, the size of the firm they own (Bates, 1990), the survival of the firm (Brüderl et al., 1992) and the performance of the firm (Bosma et al., 2004). One definition of human capital presented below shows the broadness of the scope of human capital theory which it encapsulates.

Human capital is ‘generally understood to consist of the individual’s capabilities, knowledge, skills and experience of the company’s employees and managers, as they are relevant to the task at hand, as well as the capacity to add to this reservoir of knowledge, skills and experience through individual learning’ (Dess and Picken, 1999 pp.8). It is assumed that broad labour market experiences and all forms of education (including formal, learning at work, training and any non-formal education) can increase one’s human capital (Becker, 1964). With mixed feedback from various research studies, management experience, previous business/entrepreneurial experience and labour market experience are significantly related to entrepreneurial activities, when gender and industry variables are controlled for (Robinson and Sexton, 1994; Bates, 1995; Gimeno et al., 1997).

The fact that there is ‘no substitute for knowledge and learning, creativity and innovation, competencies and capabilities’ (Rastogi, 2000 pp.196) has resulted in a shift in emphasis in terms of the view of what contributes to firms’ competitive advantages. Academics and practitioners are now favouring the argument that

knowledge based internal resources should be recognised as key to the sustainable effectiveness for firms' operations (Wright et al. 2001). Human capital, being an 'invisible asset' (Itami, 1987), is clearly a bundle of valuable, rare and hard to imitate resources that is held inside an organisation, and it is really what competitive advantage is dependent upon in the modern world (Benhabib and Spiegel, 1994). Although traditionally important resources, such as raw materials, technology and economies of scale are still important, they are increasingly easy to copy by other players in the market. Thus, it is asserted that if human capital is not equally distributed in the market, that is to say that some firms possess particular talents, experience and connections, when others do not, the ownership of such human capital can be a source of sustainable competitive advantage (Snell et al., 1996).

In the context of small business economics, the entrepreneur's own stock of human capital (i.e. education, prior business experience, reputation, connections, managerial skill, and so on and so forth) would be of critical importance to the performance of the company (Pfeffer, 1994; Rauch and Frese, 2000). Human capital as a form of resource to the entrepreneur can enable them to achieve the seemingly unachievable in a rather efficient manner (Brüderl et al., 1992). The engagement, devotion and determination of the entrepreneur to be successful in business can ensure all of his/her skills and expertise are invested in the organisation and be effectively utilised to generate the best possible outcome.

Small entrepreneurial ventures tend to be controlled by their owner-managers in terms of making any organisational decisions more than in larger or older firms (Meyer and Zucker, 1989). Because the entrepreneur's quality, skills and experience play a dominant role in dictating the direction of a newly formed business, it is essential to look into the entrepreneur's human capital reserves and his/her traits to

reveal what exactly will make a difference among this group of 'special' people (Brüderl et al., 1992; Cooper et al., 1994; Gartner, 1990).

With the intention to seek predictions for new ventures' future performance, researchers have explained how a model which captures factors of initial human and financial capital that can be observed at the time of start-up is useful with some degree of confidence (Cooper et al., 1994). Although some human capital variables are not easily changed, the advantages and/or risks associated with each can be assessed. As crucial as the initial financial capital, human capital, being part of the entrepreneur's contribution to the new venture, impacts upon how firms evolve (Bates, 1985). Therefore, if well utilised, that is to say if the potential problems or weaknesses associated with a certain type of human capital can be identified and so modified accordingly, it is believed that human capital plays a vital role in improving a firm's future prospects (Cooper et al., 1994). Boeker (1989) noted that the way a firm is founded could have important impacts on the future strategic choices of the entrepreneur and leave an imprint on the firms' development later on (Kimberly, 1979; Boeker, 1989). In other words, the initial resources that are available to the entrepreneur at the start-up stage of his/her new venture, which specifically include human and financial capital, would not only decide the range of strategies he/she may adopt to run the business but may also act as a buffer against any unexpected events (Cooper et al., 1994).

In addition to human capital (skills, behaviour and knowledge), there must also be social capital (valuable relationships and networks) and organisational capital (structures, processes and culture), which together complete the concept of intellectual capital of a business (Ulrich, 1998; Nerdrum and Erikson, 2001). The common factor

that links all of the aforementioned forms of capital together is knowledge, which is looked at in the next section.

### **2.2.1 Knowledge**

When an opportunity comes into existence in the market place, individuals with more knowledge or higher quality human capital are better placed to perceive them and make profit out of this opportunity (Ucbasaran et al., 2003; Ucbasaran et al., 2004). “Human capital theory maintains that knowledge provides individuals increases in their cognitive abilities, leading to more productive and efficient potential activity” (Davidsson and Honig, 2003 pp. 305).

The brain is the most complex construction of all. Knowledge is something that can be gained by every one of us 24 hours a day, 7 days a week, sometimes even without our noticing it is happening. Stewart (1997) stressed that every company depends increasingly on knowledge which includes from patents, processes, management skills, experiences, market awareness, management skills to literally any intellectual capital that could be part of the intangible asset of the company (Stewart, 1997). On this basis, scholars have paid a substantial amount of attention to issues of knowledge generation, leverage, transfer and integration in the human capital literature (Wright et al., 2001).

A distinction between tacit knowledge and explicit knowledge was often made in the literature that attempted to conceptualise and characterise knowledge (Nonaka, 1994). Tacit knowledge is often referred to as ‘know-how’, and it consists of non-codified components of an activity, whereas explicit knowledge is normally referred

to as 'know-what' and dictates information conveyed in procedures, processes, written documents and is taught in educational institutions (Davidsson and Honig, 2003; Polanyi, 1967). All of these forms of knowledge are obtainable through a process of entrepreneurial preparation (Cooper and Mehta, 2006). Knowledge as a unique form of capital will influence an entrepreneur's ability to withstand unexpected shocks to the firm and for an entrepreneur to take appropriate actions when needed (Cooper et al., 1994). It is also true that making entrepreneurial decisions requires the person to be able to utilise both types of knowledge and efficiently interact his/her knowledge within the social context (Davidsson and Honig, 2003).

The researcher intends to base her empirical research on one of the most intuitive and well-established theories in economy and many other areas of studies – human capital theory – especially innovation. Measures of human capital that are included in the survey design are classified under two main categories– general and specific human capital, which are examined in the next section.

### **2.3 Measures of Human Capital**

It is commonly acceptable in previous studies to categorise human capital into general human capital and specific human capital (Florin and Schultze, 2000). General human capital can be acquired through different forms or levels of education and general experience (Pennings et al., 1998). Specific human capital, on the other hand, places emphasis on skills and/or knowledge gained in a particular context or employment opportunity or industry. Because the specific human capital is embedded inside the entrepreneur and is not transferable or imitable, it to a degree represents the

entrepreneur's quality and capability to lead his/her business, and it is closely linked to the choice of activities of the operation (Gartner et al., 1999).

### **2.3.1 General human capital**

The distinction between general and specific human capital was made by Becker (1993). "General human capital relates to skills and knowledge that are easily transferable across a variety of economic settings" (Ucbasaran et al., 2008 pp. 155). It was found that measures of general human capital could influence both firms' survival and growth (Cooper et al., 1994). Traditionally, general human capital is measured by factors such as individual's age, gender, education, work experience and parental background (Becker, 1975). It appears that education, gender and work experience are the most important general human capital factors that could potentially influence the performance of the entrepreneur, therefore these will now be discussed in depth.

#### **2.3.1.1 Education**

Formal education is known to contribute to the accumulation of explicit knowledge to entrepreneurs and it is an important indicator of an individual's level of general human capital. Researchers have shown that the level of education could possess nonlinear effects upon the probability of an individual becoming an entrepreneur (Bellu et al., 1990; Davidsson, 1995). Matlay (2008) found that the need for entrepreneurship education does not automatically match outcomes in terms of entrepreneurial skills, knowledge and attitudes. Empirical results were presented to

show that the diversity of educational background of Chinese university students gave explanations to various entrepreneurial intentions (Wu and Wu, 2008). The positive relationship between education and the performance of an entrepreneur is also well documented (Evans and Leighton, 1989; Honig, 1996; Reynolds, 1997). It was noted that this positive relationship is more significantly found in the cases of male entrepreneurs who received higher education (i.e. he attended college or university) (Bates, 1995; Honig, 1998), and in general, education of all levels was particularly important to female entrepreneurs (Bates, 1995).

In contrast, Butler and Herring (1991) asserted that education could be negatively related to the performance of self-employed individuals. In addition, scholars also found that education might have no or even negative effects upon entrepreneurial activities (Greene, 2000).

In spite of the mixed views presented above, it is generally accepted that a good level of education should equip the entrepreneur with superior access to social networks compared to individuals who had received very limited education (Lange and Topel, 2006; Huang et al. 2009). Hence, through social networking, it is quite possible for well-educated entrepreneurs to have a better access to resources (particularly financial resources), to elevate opportunity recognition and so to safeguard their success (Anderson and Miller, 2003; Davidsson and Honig, 2003).

In term of channels of education, education can of course take different forms and they need not necessarily be formal. For instance, learning that took place on the job, training courses, vocational qualifications, apprenticeships and any forms of education that are not a part of traditional formal educational structure would broaden the scope of the entrepreneur's human capital and enhance one's explicit knowledge

(Schultz, 1961; Mincer, 1974; Corazzini, 1967). In addition to the level of education, the performance of businesses in relation to their owner-manager's gender has been the centre of the debate in numerous studies (Watson, 2002; Gatewood et al., 2009).

### **2.3.1.2. Gender**

Many previous researchers have found that female-owned businesses generally underperform male-owned businesses (Du Rietz and Henrekson, 2000). However, after more thoughtful measures of performance were adopted, Watson (2002) proved that female entrepreneurs are likely to be equally productive and effective in doing business as their male counterparts. He had also proposed an explanation for the possible divergence of performances found in earlier research and he suggested the fact that the approaches (or business models) women adopt to run their businesses are likely to be different from those of men could explain the lower output level in absolute numbers generally delivered by female-owned enterprises (Watson, 2002).

Two schools of thought were commonly cited in the area of study of male versus female entrepreneurs. The liberal feminist view suggests that because women are overtly discriminated against for important resources (i.e. women are more likely to be credit rationed), and women are also deprived of choices of opportunities in life (i.e. education and business experiences), small and medium sized enterprises run by female entrepreneurs will exhibit poorer performances than those of male entrepreneurs (Fischer et al., 1993). Alternatively, a social feminist theory viewpoint asserts that men and women are naturally different; in other words, they are two very different species, and thus it may not be the difference in capability that resulted in

varied performance outcomes, rather, the approaches adopted by women are in general less effective (Fischer et al., 1993). Apparently, Watson (2002) was quite happy to have taken a social feminist view in pursuing his research.

Having said that, it is not uncommon to find in real life that women are associated with lower levels of human capital in terms of education and training (Becker, 1993). It is also generally true that there are fewer opportunities made available to women to develop specific skills or enhance experiences (Watson, 2002), women are likely to end up doing business in less risky and mainly services industry sectors (Fletschner, 2006; Muravyev et al., 2007), and most importantly women encounter much greater difficulties in assembling resources (Becker, 1993; Verheul and Thurik, 2001). However, it is worth noting that women seeking equity financing are actually clustered in the appropriate industries (industries that are attractive to financiers, such as venture capitalists) and women utilise both formal and informal social networks in their search for capital (Gatewood et al. 2009). It is also recognised that, due to family considerations, women's career choice are less likely than male entrepreneurs to concentrate solely on pursuing economic goals (Brush, 1992).

Overall, gender is an important general human capital observation and is worth investigating in depth to reveal the role different gender plays in the development of entrepreneurship and in our ever-changing society. In addition to general human capital factors, there are more specific human capital indicators relating to the business context to be discussed in the next section.

### **2.3.1.3 Age**

On the one hand, it is claimed that younger owner-managers, who are energetic and ambitious, are more likely to aim at firm growth than older owner-managers, especially those who are getting closer to the retirement age (Storey, 1994). On the other hand, older owner-managers' experiences in business and their practical skills could impact positively on the performance of the company, yet relatively slower growth rates were also observed than firms controlled by younger owner-managers (Barkham et al., 1996).

Older entrepreneurs are known to be more experienced in doing business (Aldrich, 1999). Experiences relating to business ownership (Bates, 1990; Cooper et al., 1994), information processing, management skills, financing skills, and so on, represent elements that constitute the entrepreneur's human capital. However, Cressy (1996) claimed that an individual's human capital will increase with age until the person is middle-aged before it starts to diminish over time. This is seen as the ageing process. Generally, knowledge and experiences accumulate with age. In the next following two sections, the researcher is looking at entrepreneurs' work experience and business ownership experience in more detail.

### **2.3.1.4 Work experience**

The level of work experience obtained by an individual will partly determine how well this individual is capable of integrating the 'old' knowledge already obtained with the 'new' knowledge that is associated with the new task. The better and more often this integration process is performed, the better the intellectual

knowledge can be accumulated to enhance the human capital (Ucbasaran et al., 2008). Therefore, work experience is considered to be a key indicator of general human capital (Castanias and Helfat, 2001). Davidsson and Honig (2003) have further suggested that past work experiences can assist individuals to adapt to a new environment and deal with unfamiliar situations, and can potentially lead to higher productivity (Parker, 2006).

The positive relationship between previous work experience and the likelihood of an individual becoming an entrepreneur suggests that this form of human capital is directly linked to the ability, the adaptability of an individual and the successful rate of running an enterprise (Ucbasaran et al., 2008). Work experience has often been measured in terms of the number of years of experience of work; however, the nature of the skills and knowledge acquired is not mentioned (Evans and Leighton, 1989; Brüderl et al., 1992). Two alternative measures of work experience have been considered by Gimeno et al. (1997), one being the number of full-time jobs held in the past to indicate the broadness of one's knowledge bank, and the other being the achievements obtained in previous jobs to highlight the quality of knowledge learned. Although a more diverse range of knowledge is more likely to be obtainable from a number of jobs rather than from a single post, arguments against the number of prior full-time jobs held as an indicator of work experience raised the issue that frequent job changes may lead to weak knowledge and skills of an individual in each area of the work (Mincer, 1974, Ucbasaran et al., 2008).

Previous work experience related to a managerial role is regarded as a good indication of the quality of one's general human capital, which could well be leveraged to opportunity identification and the whole entrepreneurial process to pursue business objectives (Bates, 1990). In the next section, specific human capital

factors which are more entrepreneurial oriented are investigated. These entrepreneurship-specific human capitals would effectively differentiate entrepreneurs from the general crowd.

### **2.3.2 Specific human capital (Entrepreneurship-specific human capital)**

Adapted from Gimeno et al. (1997) and taking the view of Becker (1993), Ucbasaran et al. (2008) proposed the following definition of specific human capital. “Specific human capital relates to skills and knowledge that are less transferable and have a narrower scope of applicability” (Ucbasaran et al., 2008 pp.155). For instance, the most renowned form of specific human capital – prior business ownership experience - would allow experienced entrepreneurs to benefit from broader social networks and be more effective in establishing new social ties if needed (Mosey and Wright, 2007).

#### **2.3.2.1 Business ownership experience**

Prior business ownership experience differs to other forms of human capital in the sense that it is the most direct way to gain episodic knowledge of entrepreneurship, which is considered by many people – a mystery (Spender, 1996). The entrepreneur is the final decision maker of the company and takes full responsibility for his/her actions. Furthermore, the entrepreneur bears the ultimate risk of financial loss and/or reputation damage, and so the role as a business owner is going to be challenging. Hence, a much more complex combination of a very broad scope of knowledge is required from a successful entrepreneur, so that the knowledge can be leveraged into

the day-to-day operations and business strategies to identify opportunities and pursue goals (Shane and Khurana, 2003). In practice, valuable relationships with competent managers and potential investors come with business ownership experience regardless of the entrepreneur's academic discipline, age, gender, etc (Mosey and Wright, 2007). Business ownership experience can also assist entrepreneurs to create new resource combinations and business models that had never been practiced before (Parker, 2006), and the innovation of each new combination (successful or not) captures the essence of entrepreneurship at the root.

Various studies have asserted that entrepreneurs are not homogeneous entities and are of different types: novice, serial and portfolio (Birley and Westhead, 1993; Hall, 1995; Westhead and Wright, 1998). Yet, which factor is the best to use to divide entrepreneurs into various types in a sensible way? Prior business ownership experience is the answer and the ownership includes businesses that were created by the entrepreneur (Reynolds et al., 1994), inherited (Westhead, 1997) and purchased (Robbie and Wright, 1996). In the order of the various levels of prior business ownership experience the entrepreneur has encountered or achieved, different types of entrepreneurs are defined as follows. Novice entrepreneurs are those “individuals with no prior business ownership experience but are presently having shares in businesses they have inherited, purchased, acquired or founded” (Ucabasaran et al., 2001 pp.59). Serial entrepreneurs are those “individuals who had closed or sold previous business in which they had shares and presently have shares in a new business they have inherited, purchased, acquired or founded” (Westhead et al., 2005a pp.394), whereas portfolio entrepreneurs are defined as those “individuals with prior business ownership experience and shares in several businesses they have inherited, purchased, acquired or founded” (Westhead et al., 2005c pp.111).

Westhead et al. (2005a pp.394) specifically gave the meaning of habitual entrepreneurs as those “individuals with prior business ownership experience who have the capacity to start new businesses and launch new products”. They also showed in this paper that portfolio entrepreneurs (who own a number of businesses simultaneously as a portfolio), are more experienced in gathering information, spotting opportunities and have a greater capacity to process relevant information to turn opportunities to real profits than less experienced business owners (Westhead et al., 2005b). In addition to opportunity identification and exploitation, experienced entrepreneurs, for instance habitual entrepreneurs, will find prior business ownership experience is beneficial to them in terms of building reputation, cash management, networking skills, information search, crisis handling, developing expertise and many more, (Cooper et al., 1995; Shane, 2000). Prior ownership experience can make the entrepreneur more alert than novice entrepreneurs in a business environment (Ucbasaran et al., 2006).

It was noted that experienced entrepreneurs have better access to business opportunities compared to their inexperienced counterparts even if they are not actively looking for such opportunities (Kirzner, 1973). Because of this close link between the prior business ownership experience of an entrepreneur and the ability of opportunity identification and pursuit, it is an important element of entrepreneurial-specific human capital (Gimeno et al., 1997; Chandler and Hanks, 1998).

To sum up, the general and specific human capital profiles of entrepreneurs have a long history of being considered by scholars (Brüderl et al., 1992; Gimeno et al., 1997; Wiklund and Shepherd, 2003; Ucbasaran et al., 2008). The cognitive dimensions of entrepreneurship within a human capital framework have received an increased level of attention in recent years (Ferrante, 2005). For the purpose of this

study, measures of human capital were designed to capture a broad conceptualisation of human capital and still keep the later analysis intuitive. The researcher was limited to both time and the scope of the study (financing being the core of the research), as well as the length of the questionnaire and the number of questions which could be included to construct variables; therefore, not every conceivable measure of human capital was incorporated in the survey. This notwithstanding, a special type of human capital and arguably the key entrepreneurial measure - innovation - was extensively explored in the empirical chapters in relation to finance to reflect a gap in the literature and to advance our understanding of entrepreneurship in Beijing, China.

## **2.4 Innovation**

### **2.4.1 Conceptualizing innovation**

Innovation as a field of research has been hugely influenced by the work of Joseph Schumpeter. He defined five types of innovation, namely: (i) introduction of a new product or a qualitative change in an existing product and/or process; (ii) process innovation new to an industry; (iii) the opening of a new market; (iv) development of new sources of supply for raw materials or other inputs and (v) changes in industrial organisation (Schumpeter, 1934; OECD, 1997 pp.28). Later, the Oslo Manual concentrated on the first two of Schumpeter's types of innovation and attempted to set a benchmark for future research methodologies in innovation studies (Rogers, 1998). The Oslo Manual presented a definition of a *technological product innovation* as the introduction of "a new or improved product whose characteristics differ significantly from previous products" and a *technological process innovation* as the adoption of

“new or significantly improved production methods, including methods of product delivery” (OECD, 1997 pp. 49).

Dewar and Dutton (1986 pp.1422) adapted the definition of innovation proposed by Zaltman et al. (1973 pp.10) and defined this as: “an innovation is an idea, practice, or material artefact perceived to be new by the relevant unit of adoption”. They further defined “technical process innovation that contains a high degree of new knowledge (radical innovations) and a low degree of new knowledge (incremental innovations)” respectively (Dewar and Dutton, 1986 pp.1422). Similarly, but with different terminologies expressed from a different angle, a novel innovation is defined as an innovation that is new to the market, and this novelty is usually solely concerned with outputs, whereas an incremental innovation is only considered new to the firm (Freel, 2003).

Innovation in the context of entrepreneurship highlights the function of the recognition and realization of new economic opportunities (Schumpeter, 1912; 1942), in the sense that opportunities arise with potential products and production processes in many aspects of the business, not limited to the production cycle. In fact, Schumpeter’s view on innovation implicitly delivers a message of risk and uncertainty as integral parts of entrepreneurship (Audretsch et al., 2008).

Definitions that take into account the complexity of innovations often see innovation as a process of interactive learning and it is likely to be true that “the more complex the learning process, the more interactions it probably requires” (Johnson and Lundvall, 1993 pp.75). Following the work of Lundvall (1995), innovation can no longer be viewed as the simple outcome of independent decision-making at firm level, but rather it is suitable to be viewed as “an interactive, cumulative and cooperative

phenomenon, which incorporates more than simple phased dyadic or bilateral interactions between users, industry and the science base” (Freel, 2003 pp.751).

It is easily recognised from the inconclusive selection of definitions of innovation mentioned above, that there is no consensus of a generally accepted definition of innovation. In fact, innovation involves far too many factors and could be investigated in various contexts and settings based on numerous principles and can also be studied in conjunction with related theories (i.e. human capital, social capital, networking, etc.). In practice, researchers must adopt the definition that is most appropriate for the purpose of the study and accept the fact that respondents can have varied interpretations. It is however widely accepted that knowledge generation enhances regional economic performance (Lucas, 1988). Yet, to achieve economic development takes more than new knowledge creation, and in fact it is greatly determined by the competence and the willingness of innovative entrepreneurs to convert or translate knowledge into new products and processes (Audretsch et al., 2008).

#### **2.4.2 Innovation and human capital**

Innovation comprises knowledge based entrepreneurial opportunities and the passage to actually carry out innovative projects to develop new products, processes or technologies, is another part of the entrepreneurs’ role in exploiting such opportunities (Audretsch et al., 2008). A firm’s innovative technology spills over automatically to other market players once the technology is utilised in production, thus knowledge generation is an important driver of economic performance (Romer, 1990; Grossman and Helpman, 1991).

Successful innovative activities (i.e. inventions that become incremental to the production function), foster overall productivity and efficiency at all levels, micro and macro, to firms, regions, countries and the global village (Prais, 1995). Robson et al. (2009 pp.332) posits that “an innovative and thriving SME sector offers the potential for a country to generate employment, develop its domestic economy, and engage in international trade.” Practically, innovation is recognised as the most critical process to enable businesses attain competitive advantages in this modern era among local and international competitors, yet this process is incredibly costly. The United States and the OECD countries spend more than \$2.2 billion everyday on R&D (Razgaitis, 2003). This already large amount, however, does not include money spent on ‘soft’ innovations, including process innovation, marketing, distribution and so on and so forth. Logically, entrepreneurs want good enough reasoning to justify such substantial levels of expenditure and want to make sure the money is well spent. Nevertheless, evidence has long shown that the returns from invention are highly skewed, with failure a common outcome (Åstebro, 2003).

Academic studies of innovation have so far been dominated by research on the secondary sectors of the economy, such as the high-tech manufacturing sector (Drejer, 2004; Von Tunzelmann and Acha, 2004). Since there is a serious omission given the dominance of the primary sectors in developing countries (Robson et al., 2009) and economically significant innovations are equally likely to be carried out in tertiary sectors of the economy (i.e. from key service sectors and/or in terms of process developments), more conclusive quantitative studies that cover as many facets of innovation as possible are demanded (Howells et al., 2006).

According to Acs and Gifford (1996), as the firm grows, more attention is paid to trying to maintain the profitability of the existing production line rather than

investing in new product innovation. Furthermore, if the firm decides to conduct product improvements and new product innovation simultaneously, the obsolescence of the current product line will decide the share of resources allocated to each operation (Acs and Gifford, 1996). “R&D spending appears to be encouraged in youthful industries where a strong science base is present and where the government makes substantial contribution to technological knowledge” (Levin et al., 1985 pp.23).

Concerning the market structure that is the most suitable to innovation, neoclassical theories of innovation have suggested that technical change is better promoted in competitive markets that consist of many small firms, whereas Schumpeter argued in his 1942 book that large firms operating in imperfect markets are most conducive to innovation (Schumpeter, 1942). Acs and Audretsch (1987) performed a study to test whether the determinants of innovation in large and small firms are different and concluded that in addition to R&D activities, which are apparently more relevant to larger firms, certain market structure characteristics also promote innovation and the results were irrelevant to firm size.

Innovation cannot be feasible without adequate human capital and there are three forms of human capital to consider. Firm-specific human capital refers to skills and knowledge that are valuable only within a specific firm, and for this reason the impact of firm-specific human capital on the level of innovative activities in a wider society is limited due to its restricted transferability to other firms (Grant, 1996). On the other hand, industry-specific human capital pertains to knowledge and experience derived within a specific industry. According to previous research, industry experience is certainly beneficial to firm performance and growth (Siegel et al., 1993) and can take a rather important part in promoting innovative activities within an industry, provided that major players in that industry exchange quality knowledge and

information between each other (Bianchi, 2001). Hence the communication of knowledge and the innovation carried out on this basis is for the advancement of the industry as a whole rather than purely for the benefit of an individual firm. The tacit nature of industry-specific know-how that is only understandable to industry experts forms a protective boundary for the investments made by entrepreneurs towards innovative activities (David, 1975), and so to a degree protects economic return for these major players within the industry.

Intuitively, scholars then discussed the possibility of ‘cultural’ and / or ‘regional’ development of innovativeness, where people may be willing to exchange tacit knowledge on some sort of mutual grounds (Maskell and Malmberg, 1999). Any incremental knowledge to the general public is a desirable thing after all. Policies to counsel small firms to cooperate for innovation should be implemented with caution, as there may be an inverted U-shaped relationship between innovation performance and the extent to which firms access external know-how (Laursen and Salter, 2006).

Really and truly, the raw talent, the ability and core competences to innovate and be creative, is generated from individual-specific human capital more than anything else (Robertson and Langlois, 1995; Freel and Harrison, 2006). In the field of entrepreneurship, entrepreneurs’ human capital ranges extremely broadly and in fact it reflects years of accumulation of education and experience of all forms and unique ways of gathering and processing information (Pennings et al., 1998). Individual-specific human capital of the entrepreneur and of his/her employees can be considered as the initiator as well as the booster for innovative activities. The human capital factors relating to overall educational attainment, knowledge bank, economic resources and the physical well-being of the entrepreneur is therefore going to be the focus of attention and will be introduced one at a time to control the seven facets of

innovation that are investigated in this study. Innovation is at the heart of all of the hypotheses which are tested in the empirical chapters of the dissertation. It is important that the reader is made aware of the lack of consensus within the entrepreneurship, and indeed specialist innovation and R&D literature upon exactly what innovation is, but also the conundrum of how innovation can be measured. The next section looks at measures of innovation.

### **2.4.3 Measures of innovation**

The existing literature on the determinants of innovation has identified a good range of factors associated with innovation, but most of the studies have proven to be inconclusive (Robson et al., 2009). Many studies of innovation have adopted ‘technicalist’ views that narrowly looking at the technological innovative activities of product development and process advancement. The approach is likely to omit many innovative activities that are worthy of consideration (NESTA, 2006). For example, the neglected ideological innovations such as novel management practices need to be added as a dimension of innovation in the research design (Hausman, 2005; Robson et al., 2009).

Allowing a more comprehensive reckoning of the topic of innovation, Schumpeter (1912)’s broad view on innovative activities in different areas of businesses is adopted to construct the seven facets of innovation for the purpose of this study. Innovations in (i) products, (ii) processes, (iii) work practices or workforce organisation, (iv) supply and supplier relations, (v) markets and marketing, (vi) administration and office systems, and (vii) product distribution are to be addressed individually. Separately, respondents were requested to indicate whether they had

introduced innovations which were new to the market or only to the firm, so that the relative newness of the innovations is also measured.

#### **2.4.4 Financing innovation**

Small firms are typically efficient and flexible in the way they run their businesses; however, resources-wise, they are often disadvantaged and constrained (Hewitt-Dundas, 2006). As discussed at the beginning of this section, the cost of innovation is undoubtedly high and the likelihood of achieving a positive return from innovative activity is low (Åstebro, 2003; Freel, 2000a; Freel and Robson, 2004). “Innovation tends to result in growth and efficiency, but not immediately in more profits” (Heunks, 1998 pp.266). In spite of the fact that innovation is core to entrepreneurship, (Marvel and Lumpkin, 2007) and it can potentially enhance a firm’s market position and widen a firm’s business opportunities, conditions need to be met to facilitate innovation. Obviously, in addition to human capital, the availability of funding is the next in line.

It is all well and good to have risk capital injections once the innovative project is taking shape, but what about the infant stage of the business? Where do innovative entrepreneurs source start-up capital? Seed and early-stage entrepreneurs’ tend to have a few strong personal connections and brokers, whereas a wider network of professional advisors, incubators and prior-stage financiers, is largely absent (Dossani and Desai, 2006). Sensibly, motivations to innovate come from the financial advantages gained from current monopoly profits (Acs and Gifford, 1996). In other words, the experienced successful innovators are better positioned to finance future innovative projects. This experience is seen as another form of specific human capital

to the entrepreneur (Westhead and Storey, 1997). Financing innovation using internal funds may be advantageous for two reasons. Firstly, it is known to be extremely hard to convince lenders who do not possess specialist knowledge about the innovation to fund such projects from the beginning and to bear the probability of failure, which is more often than not very high (Van der Panne et al., 2003). Secondly, when an invention is waiting to be patented usually at the development stage of the innovation project, trying to obtain external financing increases the exposure of the information about the invention to the outside world through leaks and so is prone to imitation (Mukoyama, 2003; Zhou, 2006).

As far as the use of external finance at the start-up stage is concerned, public funding is an appropriate starting point for entrepreneurs (Moore and Garnsey, 1993; Dossani and Desai, 2006; Mason, 2009). Risk capital is still one of major players to support innovative ventures to start up (Global Venture Capital Survey, 2005). Due to the relatively large capital requirement for innovative activities, every possible source of finance has to be taken into account, both internally and externally (Hussain et al., 2006). Inspired by the above discussion, the following hypotheses are proposed:

*H1*: Entrepreneurs engaged in innovation are more likely to report a higher usage of their own savings as a source of finance at start-up compared with entrepreneurs not engaged in innovation.

*H2*: Entrepreneurs engaged in innovation are more likely to report higher usage of external sources of finance at start-up compared with entrepreneurs not engaged in innovation.

Several empirical studies show that both access and costs of finance hinder the growth of technology-based firms (Giudici and Paleari, 2000). Hyytinen and Toivanen (2005) found that SMEs face an upward-sloping capital supply curve under an imperfect capital market as the firm's increased use of external financing results in the marginal cost of capital to increase and eventually push the curve bent upwards. This finding is consistent with the argument that financial constraints hold back innovation and growth (David et al., 2000; Carpenter and Petersen, 2002).

Banks are perceived to assign a high-risk status to SMEs; entrepreneurs who want to pursue innovative projects are expected to find it even harder to gain access to finance (Moore and Garnsey, 1993; Westhead and Storey, 1997). Moore (1995 pp.24) suggests that "there is no clear relationship between...innovation and profitability", together with the huge sunk costs (Symeonidis, 1996) associated with innovative investment, innovative firms' ability to repay borrowings are questioned from a lender's perspective. Thus, in addition to the capital requirements, innovative firms are more prone to liquidity constraints (Acs and Audretsch, 1990). Studies have found that innovators are likely to seek more external finance and are more likely to be credit rationed (Freel, 2007). SMEs who lack technical supports, are weak in risk management, and are inexperienced with laws and regulations of innovation tend to find it is almost impossible to raise the requisite finance to even start the innovative project, not to mention the follow up funds that guarantee smooth and continuous progress (Hewitt-Dundas, 2006). Innovative ventures have to bear a high level of uncertainty (which widens the information gap which already exists between the firm and private finance providers), thus inducing the shortage of enterprise funding further (Moore and Garnsey, 1993). Two hypotheses result from the above discussion:

*H3*: Innovative ventures will possess a greater likelihood of having applied for external funding compared to non-innovating ventures

*H4*: Innovative ventures will possess a greater likelihood of having been refused access to external finance compared to non-innovating ventures.

Access to finance is an important prerequisite for establishing and developing a business (Christensen, 2007). Inevitably, it is the responsibility of the entrepreneur to be fully aware of the funding terms, positions and preferences of all possible finance providers toward projects involving different level of risks. However, enhancing the mutual awareness and coordination at the crossroads of innovation and finance is no easy task (Peneder, 2008). Apart from formal sources of finance, innovative ventures often appear to be attractive to risk capital providers (consisting of informal sources such as venture capitalists, and angel investments). A simple definition of risk capital is “capital in which repayment of the principle and expected return on capital are at least partly uncertain” (Dossani and Desai, 2006 pp.57). Because risk capital financiers own much more specialized information (particularly relevant to technology advancements), their lending decisions are much more strategic and so more likely in favour of innovative ventures which could offer fruitful potential for returns (Mason, 2009). In the light of the above concerns, a hypothesis designated to the awareness of risk capital is developed:

*H5*: The non-innovative ventures are less likely to be aware of, and to complete applications for, risk capital, compared to innovators.

Overall, looking into the two fundamental drives to initiate innovation may by and large simplify and clarify the ambiguities associated with innovation. According to Acs and Gifford (1996), innovations are either demand-pull or technology-push. Hence, knowing the initiatives of the innovation should be helpful to the entrepreneur to assess an innovative project more carefully from the start and so prepare for foreseeable difficulties lying ahead. Demand-pull manifests a higher and safer potential income from innovation, whereas technology-push manifests enhanced ability of an entrepreneurial firm to innovate (Crepon et al., 1998; Nemet, 2009). Therefore, being innovative is good so far as the business objective coincides with the motivation of innovation, since the project is more likely to be efficiently carried out and be successful (Li et al., 2006). To complete the discussion of innovation and to incorporate this important concept into the Chinese context, previous studies on innovation in China are presented in the next section.

#### **2.4.5 Innovation in China**

China, is one of the largest transitional economies in the world, and it is experiencing a transitional period switching from former centrally planned innovation regime to a more market-driven system, and this is particularly true for the private sector businesses (Li, 2009a). To quantify the achievement in the area of innovation in China in recent years, new production development serves as a good indicator. The number of finished new products recorded at the National Statistic Bureau of China for the year 2002 was 59,788 products and this number increased by 14.8% to 68,633 a year later (National Statistic Bureau of China, 2004). Since the launch of the open door policy, Chinese provinces are administered independently, in terms of

formulating economic and social development policies within their geographical area (Liu and White, 2001; Gu and Lundvall, 2006). Furthermore, cultures, customs and conventions of different regions in China can vary vastly, for both historical and social reasons, which could potentially influence both entrepreneurial and innovation processes (Li, 2009a). Thus, innovation studies performed in China need to be treated region by region as independent innovation systems (Edquist, 2005).

Innovation capacity variations across regions in China were assessed by Li (2009) for a transitional period from 1998 to 2005 using a stochastic frontier model. He found that the widening gap of innovation capacity among regions could be due to the withdrawal of injections of technology from universities to businesses that resulted in a reduction of innovation efficiency. Siu et al. (2006) carried out in-depth personal interviews of 43 Chinese, 26 Hong Kong and 28 Taiwanese small businesses. Because these businesses would be operating under different market settings, it is interesting to investigate the differences in new product development pursuits. Their findings suggest that government intervention and business approaches impact substantially upon the new product development process. They also performed a comparative study between Chinese and Western practices when it comes to innovation. They discovered apparent differences in behaviour and believe that an understanding of such differences requires knowledge about the culture and operational environment of these businesses.

It is also worth bearing in mind that government intervention remains of critical importance among Chinese enterprises, especially so for SMEs (Anderson et al., 2003). Government R&D spending is a great method to induce R&D activities in the private sector and so achieve overall technology advancement (Hu, 2001). Having to cope with years of turbulence in the private sector in China, Chinese entrepreneurs'

superior alertness and ability to respond quickly to market signals and to react to market demand are essential to the success of the undertaking of innovative projects (Siu, 2001).

Li et al. (2006) surveyed eight provinces of China from February to July 2002. In total, 850 enterprises were in their sample and 603 usable observations were gathered. Drawing from the management literature, they made a distinction between entrepreneurial-oriented innovation (viewed as a learning and selection mechanism that engenders exploratory and risk-taking behaviour, pp.336) and market-oriented innovation and they made an attempt to explain the impact of these two forms of innovation upon new product developments through the mechanisms of personal and / or output control.

An empirical study utilising a sample of 104 valid responses collected from three areas in China (Yangtze River Delta, Pearl River Delta and Jingjintang Economic Zone) was performed aimed at gaining insights into the performance of China based subsidiaries of multinational companies (Zhang et al., 2009). Their findings suggest that subsidiaries with better performance are generally associated with good use of knowledge about competition, are keen to develop moderate innovative products, smooth communication with various functional departments and product development groups, codified knowledge, and having a supportive culture within the firm.

Taken into the unique set of market conditions that there are in China, innovation and imitation strategies on new product developments were examined (Zhou, 2006). Empirical results were derived from a cross-industry survey of 298 usable respondents collected out of a sample of 1000 manufacturing firms that

spanned across a diverse range of manufacturing industries (i.e. chemical, furniture, food, plastic, electronics) in three cities in China (Beijing, Shanghai and Guangzhou). He asserted that innovation strategy is more favourable within a market with uncertain demand, rapid technology changes and intensified competition, which are exactly the characteristics of this economic growth period in China. He also proved that innovation leads to better new product performance compared to imitation.

Clearly, in order to promote innovative activities in the economy and so to fertilise the development of entrepreneurship, the functioning of communities and societies is vital (De Clercq and Dakhli, 2004). Storper (1995, pp.203) stated that: “the innovative milieu is essentially a context for development, which empowers and guides innovative agents to be able to innovate and to co-ordinate with other innovating agents.” The success of such milieus hugely depends on entrepreneurs’ social capital (Maillat, 1998). Knack and Keefer (1997) studied 29 market economies and found social capital was positively related to economic performance. Freel and Harrison (2006) pointed out that cooperation and networking are seen to be the means to not only preserve the behavioural advantages of small businesses but also to help to mitigate the extent of material constraints. Studies that account for the relationship between networking and cooperation among high-technology ventures have been relatively commonplace in recent years (Tödtling and Trippel, 2007; Xu and McNaughton, 2006). Hence, the understanding of the concept of social capital and its effect upon innovation and entrepreneurship offers another dimension to the research. In the next section, social capital theory will be discussed.

## 2.5 Social Capital Theory

Social capital is another of the key elements of entrepreneurship, in the sense that it is a crucial resource of the entrepreneur that can be withdrawn to boost the probability of success in many aspects of the business. These aspects could be connected but not limited to knowledge accumulation (Yli-Renko et al., 2001), the successfulness of innovation (Cooke and Wills, 1999), internationalisation (Keeble et al., 1998), entrepreneurial opportunities recognition and exploitation (Arenius and De Clarcq, 2005), and so on. Scholars have extensively explored the nature of social capital in entrepreneurial networks (Coleman, 1990; Cooke and Wills, 1999; Tsai and Ghoshal, 1998; Anderson and Jack, 2002; Shane and Stuart, 2002; Davidsson and Honig, 2003). Very precisely, social capital is defined as “a social relational artefact produced in social interactions...and it represents a pool of goodwill residing in a social network and it can be envisaged as a revolving mutual fund of traded and un-traded interdependencies (Anderson et al., 2007 pp.245).” In simpler terms, social capital is seen as “resources embedded in a social network accessed and used by actors for actions” (Lin, 2002 pp.25) and can also be referred to as the ability of actors to extricate rewards from their social structures, networks and memberships (Lin et al., 1981; Portes, 1998; Batjargal and Liu, 2004). It is a multidimensional concept that can occur both at individual and at firm level (Nahapiet and Ghoshal, 1998).

Within the variables created and used in the empirical analysis chapters, capturing suitable measures of human capital has been extremely challenging. Accordingly, the reader needs to be aware that the social capital construct is not ideal. The remainder of this section in outlining the multidimensional nature of social capital clearly signals the difficulties in developing social capital measures.

Extended family members, community networks, or organisational connections are the traditional social capital owned by individuals and are seen to supplement ones' human capital and financial capital in pursuing entrepreneurial ventures (Bourdieu, 1983; Coleman, 1988; 1990). To enable social connections to work in favour of the running of the business, the strength of ties between parties within that social circle need to be "meaningful and consequential"(Cook and Whitmeyer, 1992 pp.118; Burt, 2000). In other words, these ties can potentially have significant impacts on entrepreneurs' accessibility to key resources (Jack, 2005). Research of networks can involve a wide range of considerations, including network size, structure, impacts, interactive processes, benefits, skills, behaviour, and risks (Van Deth, 2003; Coviello, 2005). Even though networks have admittedly important theoretical and practical values in entrepreneurship studies, the diverse nature and the lack of a consensus in the approaches adopted to study the concept has proven to be less practical and meaningful to the understanding of the phenomena (Jack, 2010).

It is argued that 'trust' acts as an enhancer to the strength of the networking in the social circle, and it is recognised that the existence of 'trust' is often a result of obligation or threat of censure (Coleman, 1988). Hence, 'trust' only bonds beneficiaries together when the obligation still holds. For example, 'trust' plays a key role in lender-borrower relationships where both parties expect a mutual benefit from maintaining their relationship/fulfilling the loan contract (Saparito et al., 2004). Unfortunately, there is no single universally agreed definition of 'trust' and 'trust' takes different forms within different disciplines (Welter and Smallbone, 2006). The dimensions of trust are both diverse and debatable and can take forms of personal trust (Zucker, 1986; Chen and Barnes, 2007), institutional trust (Williamson, 1993), inherited (Coleman, 1988; Nguyen et al., 2005), calculus trust (Lewicki et al., 2005)

and unconditional trust (Jones and George, 1998; Howorth and Moro, 2006). Because ‘trust’ is not a theme that is going to be developed as an integral part of this research project, it is not specifically defined in the context of this dissertation.

Another important advantage of building a strong social capital reserve lies with the bridging and bonding mechanism social capital has to offer (Putnam, 2000). Exchange of information and the shared benefit of resources to external networks can be helpful to the entrepreneur to access critical resources that are normally scarce to others (Adler and Kwon, 2002; Putnam, 2000). Weak ties as opposed to close ties (i.e. family ties) mean loose relationships between individuals. A weak form of extended network is commonly found in a group of self-employed individuals who have a common interest in an area of business in order to maintain the flow of information, for instance, information about potential jobs (Granovetter, 1973). This argument is particularly true for the building trade. Some entrepreneurs join trade clubs or maintain memberships to gain access to industry-specific information, especially to keep on top of the latest technological innovations (Anderson and Jack, 2002).

The researcher included proxies for family business in the survey observation for three reasons. First, a family tie is believed to be the closest form of tie between people as it is by blood. Secondly, it is a Chinese tradition that family members quite often offer free (or at least very cheap) supports of all kinds (i.e. finance, premises, connection, etc) to their relatives, especially at the start-up stage of a new venture, in exchange for unquestioning loyalty (Lee, 1996). In some situations, for instance when the local community is very close, senior members of a family almost feel obliged to help out the younger generation (Zapalska and Edwards, 2001). Last but not least, such strong family ties in a business context provide an incomparable sense of security and confidence to the entrepreneur, in the sense that ideas are shared

collectively and a wider and easier access to resources is available at the entrepreneur's disposal (Sheh, 2001). Thus, the entrepreneur can make sure that his/her personal qualities and capabilities are fully utilised in achieving economic goals for the venture.

However, strong ties (i.e. family ties or partnership) can be restrictive when one's accumulation of personal resources grows to a certain level. Contradictions often occur when the entrepreneur makes strategic decisions (i.e. to take dramatic actions to expand or diversify). Although the intention is to take the firm to the next level, opinions are not easily agreed across all members with close ties and so a weak form of social capital becomes more attractive (Cook and Whitmeyer, 1992). It is also argued that networking investments in general may lead to diminishing marginal resource returns, which can include returns in the form of financial, informational, emotional and/or contact support (Semrau and Werner, 2009).

The typical ways of forming weak ties are results of association based on friendship or advice (Paxton, 1999). From an entrepreneurial perspective, social capital provides channels leading on to opportunity identification, information sharing and access to resources (Greene and Brown, 1997). Information is not readily available to everyone and is usually insider information to the owners of resources. In the event of asymmetric information, social capital becomes increasingly important to the entrepreneur who is prepared to nail the deal at the best time (Shane and Venkataraman, 2000). Things happen unexpectedly, and therefore timing is vital.

Social capital may be used to explain the phenomena that entrepreneurs often start businesses that are familiar to themselves somehow (Cooper and Dunkelberg, 1986). The connections could come from former occupations or families and close

friends who are also business owners. Basically, entrepreneurs rely on social capital to discover opportunities and successfully fulfill their firm's needs at different stages of the business cycle (Arenius and De Clarcq, 2005). Bridging and bonding social capital enables the entrepreneur to efficiently and effectively evaluate opportunities and facilitates the procurement and utilisation of resources necessary for opportunity exploitation (Aldrich and Zimmer, 1986). A rich endowment of social capital can effectively enhance information flows and resources allocations (Anderson and Jack, 2002). After recognising benefits associated with social capital, the serious issue of the risks of relying on social capital are to be looked at next.

### **2.5.1 Risks of relying on social capital**

One of the most distinctive beliefs of the Chinese philosophy is that there are two sides to every coin. The possession of a high level of social capital is by and large beneficial to the entrepreneurs, however, entrepreneurs may face a few risks associated with the over reliance on social capital and can potentially lose their individuality.

First of all, as mentioned earlier, the ties may not only bind, but also can blind (Powell and Smith-Doerr, 1994 pp.393). In other words, there are situations when the flow of information can actually be reduced. For instance, new ideas are only exhibited to linked group members and consequently opportunities remain static (Gargiulo and Bernassi, 1999). As a result, it could be hard to introduce something new.

Secondly, the bonding of friendship and/or membership obligations may force entrepreneurs to enter into second best (or not entirely beneficial contracts in the worst scenario) business contracts within the social circle (Portes, 1998), whereas there are better opportunities that cannot be exploited and this over embeddedness can be discouraging to entrepreneurial activities (Uzzi, 1997). Thus, inefficient allocation of resources appears which could be harmful to the firm and also to the economy.

Lastly, building and maintaining social connections are very costly and do not always promise a payoff in economic terms, because much of the reward for social interactions is intrinsic (Arrow, 2000). Zhang and Fung (2006) discovered that membership of an organisation or club does not appear to be significantly influential to the performance of Chinese enterprises. The efforts and time devoted to enhancing social capital may not be suitable to everyone (Knight and Yueh, 2008) and cannot be measured precisely (Fernandez et al., 2000). Social groups form naturally according to ideas, values, norms, rules and background. In fact, social capital establishment is a very complex issue and may come with unaffordable commitment and or obligations to individuals who do not naturally belong to the group (Hansen, 1998). Although it is never said, Chinese entrepreneurs sacrifice a considerable amount of financial capital as well as other forms of resources to open up new channels of connections and can eventually find themselves worse off in real terms (Park and Luo, 2001). Social capital entails obligations and costs (Yang, 1994) that must be repaid at some point.

In essence, when information is distorted in a transitional economy, the social network (Guanxi) becomes unavoidable to facilitate economic exchanges and administrative barriers (Park and Luo, 2001). Chinese entrepreneurs are engaged in extensive networking activities in order to gain an edge over competitors (Kao, 1993; Tsui and Farh, 1997). It is generally accepted that a good relationship with local

governments can be crucial for the entrepreneur if he/she wants to seal a deal during a negotiation (Pye, 1995). However, during a period of economic reform, due to the unstable nature of the society, social capital management is vital to ensure that 'guanxi' is indeed reciprocal and so a positive return can be expected from investments made to cultivate networks (Park and Luo, 2001).

Despite the fact that social capital (guanxi) is an integral part of Chinese business culture, to actually identify and quantify the mechanisms by which it functions, in other than the most general terms, is extremely difficult. The researcher has the undoubted advantage that, being a native of Beijing, she has a natural understanding of the culture. Asking questions about such a sensitive, even taboo, aspect of business – the networks of contacts, the informal sources, financial and other, - would not only deeply offend the respondent but also seriously put at risk the response rate of the survey. Because of this difficulty in gathering data on social capital, it is not included in the empirical section of the study.

## **2.6 Conclusion**

The purpose of Chapter 2 is to construct an intuitive and firm foundation to tie empirical findings of this thesis to well-received entrepreneurship theories, including human capital theory, innovation studies and social capital theory. Materials covered in this chapter play integral parts in the designing stages of the survey research. This literature review chapter signposts the reader to fundamental variables that have influence upon the access to finance of SMEs. More importantly, as the empirical findings are focused on financing issues related to innovative small business ventures, in-depth knowledge and debate of innovation is specifically dealt with in the review.

The chapter started by presenting reviews of arguably three of the most important elements of entrepreneurship, namely human capital, innovation and social capital. The traits, characteristics, knowledge, ability, capability, innovativeness, creativity, connections and many more special factors associated with the entrepreneur and their business model are fully captured within these aforementioned theories. In fact, these theories are the foundation for any entrepreneurial ventures and are unique from one person to another and from one venture to another (Davidsson and Honig, 2003; Mosey and Wright, 2007).

The understanding of the aggregate essence of human capital, innovation and social capital has made entrepreneurship such an interesting and exciting subject which can be full of surprises. At the same time, policy-makers and practitioners need to study these theories in order to obtain fundamental knowledge of SMEs and their leaders (Lundstrom and Stevenson, 2005). Entrepreneurs need to adapt to ever-changing business environments, and so do the regulators.

In addition to human and social capital, none of the entrepreneurial ideas or innovations can be facilitated without financing. SMEs are often found to be financially constrained and are disadvantaged over their larger counterparts (Berger and Udell, 2006; Beck, 2007; Ruis et al., 2009). The researcher is therefore seeking to explore the practical reasons and theoretical explanations behind the restrictive nature of finance availability faced by SMEs by performing an extensive review of the theories of finance in the next chapter.

## **Chapter 3:**

### **Theories of Finance**

#### **3.1 Introduction**

The main objective of this PhD study is to explore financing difficulties SMEs encounter in China, thereby gaining an understanding of a good range of theories in finance which are fundamental to this research. They set a theoretical framework, which allows the researcher to raise questions and construct arguments sensibly. More importantly, variables that are relevant to research questions can be correctly identified through theoretical thinking and so can be designed into the survey questionnaire later. Chapter 3 is designated to the insights of relevant theories of finance and acts as a foundation for the entire thesis.

The researcher will start the discussion by presenting the most important hypothesis in finance – the Market Efficiency Hypothesis, which will naturally lead us onto asymmetric information issues and the agency theory afterwards. Then, the capital structure is examined with or without taxation, and an extended discussion about possible determinants is also included. After the access to both internal and external sources of finance is explained, the researcher moves on to the pecking order theory which attempts to order sources of finance per preference. Finally, the illustration of policy influences and financial supports from the Chinese government to SMEs in China concludes this chapter.

### 3.2 Market Efficiency

The notion of market efficiency was first stated by Hayek (1945) and quoted in (Danthine and Donaldson, 2005 pp. 347) who celebrated “the virtues of the market as a formal and precise context in which the valuable pieces of information held by heterogeneously informed market participants are aggregated and freely transmitted to all via the trading process”. Fama (1970) further illustrated a similar view in the term of the *strong form efficiency*, defined as a situation where market prices fully reflect all publicly and privately available information. Fama (1970) also introduced the notions of *weak form efficiency*, covering situations where market prices only fully and instantaneously reflect historical prices, and of *semi-strong form efficiency* that covers situations where market prices reflect all public information.

The concept of market efficiency is paramount to finance. At the same time, economists more often refer market efficiency to operational efficiency of the economy as a whole. In other words, they concern the way resources are allocated or employed to facilitate the functionality of the market (Dimson and Mussavian, 2000).

More specifically, if the capital market is efficient, or the economic society is really operated by way of a pair of “invisible hands” (Adam Smith, 1776), finance providers should be able to value sufficiently what entrepreneurs’ have to offer. According to their evaluation, they should then make their decisions on whether or not the finance could be offered and at what rate. Depending on the risk attitude of different finance providers, risky and less risky projects all stand a chance of attracting sufficient investment as long as the project is viable. Therefore, the market should not present a gap in the allocation of finance.

Having said that, in his book Adam Smith also stressed that quite considerable structure was required in society to enable the invisible hand mechanism to work efficiently. He gave two crucial assumptions that were to be held before the economy could be left to run by itself. Firstly, property rights must be strongly protected, and secondly, there must be widespread adherence to moral norms. When referring to 'moral norms', he specifically meant that the prohibitions against theft and misrepresentation were vital. In order to exchange goods and services, contracts must be enforceable, people must have good access to information to assess the products and services on offer, and finally the law must hold to rule (Adam Smith, 1776). It is then obvious to us that the societies people live in nowadays have many moral loopholes and the system itself is far from satisfactory by Adam Smith's standard. Therefore, till today, even the most developed countries, such as the UK and USA, have settled for a predominantly free market approach with assistance from government interventions.

The Chinese economy has recently undergone a considerable transition, from central planning towards a more mixed market economy. Much of this followed the 'open door' policy of 1978, which was intended to open world markets to Chinese goods, and to open China to world markets and foreign investment (Anderson et al., 2003; Garcia-Fontes, 2005). The economic reforms associated with the 'open door' policy re-legitimised private enterprise, allowing individuals to own the means of production and exploit their labour to earn a living in a privately trading economy. Some argue that private entrepreneurs in China have gone through stages, of strict prohibition, tolerance, accommodation and encouragement (e.g. Peng, 2004). Currently, encouragement and accommodation are to the fore. For instance, on the XV<sup>th</sup> Congress of the Chinese Communist Party (CCP), Secretary-General Jiang

Zemin suggested that the CCP should actively recruit private entrepreneurs since they represent advanced productive forces (Peng, 2004). The “crossing the river by feeling the stones” reform mentality, proposed by Deng Xiaoping, meant that market reforms have been gradualist, with partial reforms introduced as localized experiments and allowed to spread gradually (Anderson et al., 2003). Therefore, from the researcher’s point of view, we would not be exaggerating if we say that although the improvement of efficiency throughout the special economic and political system in China is noticeable, the private sector still suffers from a weak form of market efficiency, as more often than not, information is not shared for public consideration.

The degree of market efficiency varies across economies. In reality, many previous studies have shown that in most developing countries, one of the major challenges for small business entrepreneurs is to gain access to finance (Levy, 1993; Parker et al., 1995; Abor and Biekpe, 2006; Zhao, 2008). There is also evidence that small business entrepreneurs, in both developed and developing countries, have experienced some difficulties in obtaining bank loans (Levitsky and Prasad, 1987; Berger and Udell, 2002; Shao, 2004; Wu et al., 2008). Banks are thought to assign high-risk status to small firm credit proposals and are, accordingly, less likely to provide financing to such businesses. This argument is most commonly made with reference to developed economies, though it has also been made with reference to emerging or transitional nations such as China (Chow and Fung, 2000). Giving an example of how well information is transferred from top to bottom, Zuo and He (2010) found that the capital market in China does not respond efficiently to any monetary policy changes. They particularly pointed out that the interest rate had not been used well as a balancing tool on many occasions due to problems associated with institutional settings (Zuo and He, 2010).

Information transparency of SMEs is significantly weaker than larger enterprises that are publicly listed (Uchida et al., 2006; Cong, 2009). This is one of the most severe factors that has contributed towards the SMEs' encountering financial disadvantages. The information set is a vital determinant of market prices and the market acts as an intermediary for information transmission. Therefore, it is essential for firms to convey firm-specific information to the market, especially but not limited to the time when the finance is needed. Provided the demand side has made the move first and information is readily available for evaluation, the supply side is less likely to be in a position to look for further excuses not to fulfill the financing gap in the market. As a result, a more efficient market is achieved.

As information is already been brought to the spot light and it is one of the main controversies inducing market failures, information asymmetry is discussed in the next section.

### **3.3 Information Asymmetry**

Since Akerlof (1970), asymmetric information is referred to as a situation where one or a subgroup of agents owns superior information and because this privately held piece of information is not absorbed in the market, it can potentially lead to a market failure where the market does not efficiently allocate resources. In the equity market, investors may be suspicious of the exact value of the underlying stock due to the lack of information transparency, which could be the result of improper institutional settings, untruthful disclosures and misrepresentation of the publications provided by firms (i.e. accounting and earnings manipulation) and/or weak enforcement of professional ethics upon practitioners (Such as in Enron and

WorldCom Cases). Investors therefore believe that the better-informed stockholders would only agree to sell at a price higher than the fundamental value of the firm and any rises in share prices are the result of speculative activities (Danthine and Donaldson, 2005). In the extreme case, the market value evaporates dramatically and it is hard to restore the investors' confidence again. The information problem contributed towards explaining the fact that capital raised by companies in equity markets is such a small proportion of total firm financing (Greenwald and Stiglitz, 1993).

Asymmetric information may also explain the credit-rationing phenomenon, where lenders are confronted with a demand for funds larger than they can accommodate, and hence to increase the interest rate levied on the loan balance demand and supply. Doing so, the lender literally discriminates against a group of applicants in an unfavourable way. Asymmetric information comes into play when the lender does not hold enough information about the applicants and their proposed projects in order to evaluate the risk that the lender is likely to tolerate (Danthine and Donaldson, 2005 pp. 338). However, the creditor can be worse off by lending to riskier borrowers at higher rates and eliminating low risk projects due to a high hurdle rate (Stiglitz and Weiss, 1981).

However, to prepare and convey information related to every project the entrepreneur is considering doing is far too expensive and time consuming, and it may not even be economically feasible to request all SMEs to prepare and convey information to the public with full or part disclosures included in their annual reports as their larger counterparts do. The significant costs they are deemed to incur in providing such information to outsiders may further hinder the willingness of entrepreneurs to carry out such practices, especially when not knowing whether a

higher proportion of their needs for extra finance are likely to be fulfilled when including such information with the loan application.

The costs associated with the preparation of financial reports in line with all relevant rules and regulations, so that the accounts can be seen as showing a “true and fair” view, are indeed very expensive for SMEs. The fact that the audit exemption thresholds were raised to the level of net turnover of not more than £6.5m (increased from £5.6m) for small firms and £25.9m (increased from £22.8m) for medium sized firms, applicable to accounting periods that began on or after 6 April 2008 in the UK in accordance with the Companies Act 2006 has shown the compliance cost burden to SMEs. Although all registered companies are requested to file their accounts every year, it is clear that the government intention is to ensure the cost to small firms of producing financial information is proportionate to their level of business activities and is kept to a sensible level of expense for compliance.

In contrast, the attitude towards solving information problems for SMEs in China is somewhat different from the Western countries. Despite the fact that all parties, including the bank, the entrepreneur and the authority, admit that information asymmetry is the most serious problem that affects the success of loan applications, particularly for SMEs, none of the parties involved is willing to initiate a positive move by building a sense of ‘trust’ among each other as a bridge to achieve better communication (You et al., 2003; Zheng and Zhao, 2009).

From the banks’ point of view, financial statements provided by SMEs are not accurate enough and many incidences revealing ambiguous ownership rights to enterprises make it even harder for the bank to believe the borrower is actually worthy

of credit (Cong, 2009). To make matters worse, banks' screening, evaluating and monitoring methods are inadequate.

'The report on the current issues of Chinese Small and Medium Sized enterprises' financing and the inquiry into the credit guarantee system 2009' published by Renmin University of China and The Ministry of Industry and Information Technology of the P.R.C. raised a few noticeable problems relating to the lack of information transparency which greatly affects the access to bank loans to SMEs in China (Renmin University and Fullertong Guarantee, 2009). Firstly, information being held by various government departments (such as the Taxation authority and the Customs) and also Inter-bank information which are considered to be official and more credible could be utilized in establishing a credit rating platform designated to SMEs. Secondly, the legal framework concerning subjects such as, the degree to which firm-specific information should be revealed and the protection of confidentiality of such information, should be in place and known to the public. By doing so, a sense of assurance could be given to both the lender and the borrower from the authorities.

Since bank loans are the main source of SME's finance, it is necessary to address the relationship between the entrepreneurs and the creditors (where the entrepreneur acts as the agent of the creditor). The information problem must also be taken into consideration, as it is inevitable to the successfulness of debt contracts and the terms of the loans (Jensen and Meckling, 1976).

### 3.4 Agency Theory

Agency theory must be carefully considered within the SME context, because most SMEs are privately owned, so managers are very likely also the owner of the SMEs. In this case, there are actually no agency costs between managers and shareholders. However, agency conflicts between shareholders and lenders may be particularly severe, as Van der Wijst (1989) and Ang (1992) denote. Lenders want to make sure that the entrepreneurs act in accordance with their contractual obligations, and particularly in paying back the loan and the interest. With very limited control over the firms and information problems, the interests of the lender (the principle) and the entrepreneur (the agent) cannot be identical (Storey, 1994). The agency problem is also one of the reasons why SMEs prefer internal funds to debt financing.

Agency problems in the form of information asymmetry, moral hazard and adverse selection are more likely to arise between SMEs and external providers of capital. In the financial context, moral hazard is “invoked to oppose policies that reduce the losses of financial institutions that have made bad decisions. In particular, it is used to caution against creating an expectation that there will be future bail-outs” (Summers, 2007 Financial Times 24<sup>th</sup> September). Akerlof (1970) first noted the adverse selection problem – sometimes referred to as the lemon problem, which arises from the inability of traders/buyers to differentiate between the qualities of certain products. Moral hazard and adverse selection problems may be greater for SMEs because of their hesitation to reveal private information to outsiders.

Similarly, the persistence of asymmetric information, to mitigate agency problems, monitoring could be costly. The trust between the lender and the borrower is not easily established either. The existence of these problems for small firms may

well explain the greater use of collateral in lending to small firms as a way of dealing with agency problems (Chittenden et al., 1996).

The supply side of the story having been explored in the earlier sections, other factors determining the demand are to be considered next. Influenced by institutional, economical and ideological factors, the composition and the preference of firm's finance may vary. In the next section, the researcher is moving onto another important theory in finance, namely capital structure, to explore this milestone theory in its original form, after taxation is introduced, the capital structure that is typical to SMEs, and the determinants of capital structure for SMEs.

### **3.5 The Capital Structure**

Capital structure is broadly speaking a mix of debt and/or equity that funds the operations of a company. Equity is held as shares of stock in a company and shareholders are in effect owners of the company. Debt can be an arrangement directly between the lender and the borrower on agreed repayment terms, or alternatively a "bond" can be created, thus allowing the transfer of ownership of future repayments to new bondholders. Although it is possible to create securities bearing elements of both equity and debt, the chances that SMEs to issue convertible debt are extremely small, therefore for the sake of simplicity, such complication is avoided.

By studying the capital structure in relation to SMEs, the researcher is hoping to identify the likely determinants of SME capital structure, to discover the role

entrepreneurs' behaviour and choice play in financing decisions and to gain a deeper understanding of the side who seeks finance.

### **3.5.1 The original Modigliani and Miller's (M&M) proposition I**

To allow further investigation of a firm's capital structure, an important assumption must be addressed, which is the notion of a perfect market. A perfect market is one in which there are neither taxes nor transaction costs and the numbers of buyers and sellers are sufficiently large, and any individual's controllable finance is small relative to the size of the market and therefore cannot affect the market prices through trading. Under the assumption of a perfect capital market, Modigliani and Miller (1958, 1963) demonstrated that a firm's capital structure was irrelevant to its market value and the value of the firm solely depends on the firm's asset capacity to generate profits. This theorem was later generalized in Stiglitz (1974), who argued that, in the absence of taxes, the lower cost of debt compared to equity would be exactly offset by the increase in cost of equity as debt increases (due to higher risk), and therefore the cost of capital remains constant. If the cost of capital does not change, the different combinations of debt and equity should be indifferent to each other, thus 'capital structure irrelevance' holds. Having said that, M&M proposition I relies on investors being able to borrow money at the same interest rate as companies, as if they cannot, companies can increase their market value simply by increasing their borrowing.

Ever since the original M&M's proposition was introduced, capital structure has been known as one of the most perennial puzzles in finance (Myers, 1984). A substantial boost of research works in the development of a capital structure

theoretical framework within which the irrelevance theory is questioned and revised were carried out by many scholars, who developed their own theoretical aspect and sculptured their own piece in the capital structure puzzle. For better or worse, as Myers (2003) notes, the present theories of capital structure are conditional and are relevant in different settings. This is well documented in empirical studies of capital structure, which have found support for all theories. Firms' behaviour seems to be a hybrid of the proposed theoretical foundations.

M&M's simple but strong statement about capital structure was a great starting point. From this, assumptions behind the proposition can be weakened conveniently and the phenomena can be studied in isolation. For instance, topics such as the introduction of transaction costs, bankruptcy costs and the creation of a new financial instrument aimed at making short-term abnormal returns before it is copied in the market were considered yet these concerns do not propose major issues to capital structure. Taxes, however, once introduced, can change the result dramatically. The researcher is going to look into this matter further in the next section.

### **3.5.2 Capital structure after introducing taxation**

When taxation was introduced in the model, the benefit of the deductibility of the interest paid on debt for tax purposes, made debt a cheaper choice of external finance. These tax advantages, also referred to as the 'tax shields', is given to debt rather than equity. When the model was modified to include corporation tax, M&M's proposition show that the value of the firm increased linearly with the increase in the amount of debt borrowed (Brealey and Myers, 1991). Modigliani and Miller (1958) thus concluded in their proposition II that firms should borrow as much debt as

possible. However, the financing behaviour of companies cannot be explained by M&M proposition II. Scholars were then motivated to do further modifications to the model.

Miller (1977) has argued that the advantage of the 'corporate tax shield' is reduced by the effect of personal taxes on investors. In addition, the cost of financial distress (typically an example being bankruptcy cost) increases with added debt. Mathematically, as debt increases, the corporate tax shield increases and is added to the firm's value, but the probability of financial distress increases too, thus the present value of the cost of financial distress increases and is deducted from the firm value. Consequently, the value of the firm is maximised when the present value of the tax savings only just compensates for the increase in the present value of the cost of financial distress (Myers, 2001), in other words there is a trade-off. Following the same logic as the discussion above, Miller presented the "static trade-off theory" in his 1977 paper; however he also stated that there is at the end of the day no simple formula for the optimum capital structure of a firm. A trade-off is a difficult balance to strike between the tax advantages of firm's borrowing (adjusted for investors' personal taxation liabilities) and the costs of financial distress.

Another cost associated with debt financing which is hard to quantify is the agency cost. As managers are frequently known to have incentives to spend company money for their own benefit instead of purely working on behalf of the shareholders, debt financing can limit the free cash available to managers and thus reduce the agency problem (Jensen and Meckling, 1976). However, if the debt becomes too large, the conflict between shareholders and debtors is triggered. Because of the limited liability nature of companies nowadays, under such circumstances, both the agency

cost and the bankruptcy cost are significantly raised (Modigliani and Miller, 1963; Jensen and Meckling, 1976).

Although theories have given us guidance about what we might discover in the capital market, and evidence has supported some modifications of M&M's propositions, studies concentrating on the capital structure of SMEs are really what matters to this study and are interesting to explore in details.

Berger and Udell's (1998) financial growth model tried to explain the change in financial needs from the SMEs' perspective through the business stages of start-up, growth and continued expansion and other scholars in later studies often adopted this financial growth cycle as a sensible view of small business capital structure (Gregory et al., 2005). Even though many scholars have examined the capital structure decisions from the perspective of small businesses (for instance, Poutziouris and Chittenden, 1996; Berger and Udell, 1998; Cassar and Holmes, 2003; Gregory et al., 2005), empirical research based on China has remained scarce. The researcher intends to present the best of the very limited body of empirical researches which have focused their studies on the topic of capital structure of SMEs in China in the next section.

### **3.5.3 Previous researches in SMEs' capital structure in China**

In emerging markets, where capital markets suffer from considerable numbers of imperfections and anomalies, the assumption of a perfect market cannot hold and rational behaviour from investors cannot be expected. It is also widely accepted that the capital structure decisions made in small businesses are different from their larger

counterparts for the obvious reason of information asymmetry we discussed earlier (Wu et al., 2008). Because the supply of finance to SMEs is generally limited in China, firms are not free to adjust their leverage ratio when they feel the change could be beneficial, as such adjustments are constrained by the financing sources available to them (Wu and Yue, 2009). Historical influences have also left an impact in the capital market which tends to act in favour of state-owned enterprises rather than SMEs, thus SMEs have often found themselves being discriminated against and had to suffer a lack of access to external funding, especially long-term financial support (Wu et al., 2008).

A research group headed by Hanchun Lin conducted two separate surveys on the financing condition of 2000 SMEs in 1998 and subsequently of 14000 SMEs. The first survey suggested that 75% of the SMEs studied funded their business using capital originated from self-accumulation, 53.5% of the firms took out bank loans and most of the loans were issued by state-owned commercial banks (Wang, 2004). The sample range of the second survey was widened, yet results remained very similar (Wang, 2004).

A later survey however on a much smaller scale survey was carried out in 2006 and investigated the access to different sources of capital at start-up and showed that 73.3% of the firms utilised owner's personal savings as initial capital, 63.3% of firms had to borrow from friends and family, bank loans were accessible to 56.7% of the sample, 28.3% of the firms had capital injections from business partners and 23.3% of firms obtained initial capital from external parties (presumably from business angels, informal channels, etc.) (Wu et al., 2008). From the empirical evidence, although the results are consistent and confirm the still tough financing

environment for SMEs in China, regrettably, much welcomed enlargement of debt financing provided by banks was not seen to be significant.

Considering the tax shield impact on capital structure, Wu and Yue (2009) presented interesting and profound results, after examining an unique circumstance in China, immediately after the central government scrapped the Local Government Tax Rebate (LGTR) policy, this effect gave scholars an opportunity to study the exogenous effect of a tax increase on capital structure to firms who received LGTR and to compare the changes with firms whose tax rate remained constant as they were not receivers of such tax rebate (Wu and Yue, 2009). They found first of all, an increase in corporate tax would lead to higher leverage, thus the result is in line with the theory which suggests firms with higher tax rates should use more debt (Graham, 2003). Secondly, they suggested that the actual level of increase in leverage after the tax is raised depends on firms' access to bank loans (Wu and Yue, 2009).

In the following sections, the researcher would like to try to identify an inconclusive list of determinants of capital structure taking into account the special circumstances of Chinese SMEs. The researcher has purposely selected a list of possible determinants, as the factors on the list are either very specific to SMEs or tells a controversial story to the audience.

### **3.5.4 Determinants of capital structure for Chinese SMEs**

#### **3.5.4.1 Firm size**

It is claimed by many scholars (see Warner, 1977; Smith and Warner, 1979; Ang et al., 1982; Pettit and Singer, 1985) the size of the firm is important to its capital

structure. They pointed out that the larger the firm, the more diversified their risks and thus the less likely they are to fail. Therefore size can be an inverse proxy for the probability of bankruptcy, which is a major cost to be taken into account for both investors and owner-managers in the financing decision-making process.

Gregory and Tenev (2001) concluded from a survey of over 600 Chinese SMEs conducted in 1999 that the firm size does have a relative importance in determining the sources of finance firms gained access to and therefore to a degree determined the firms' capital structure. They also found that the smallest firms would rely heavily on informal finance if they needed external financing and this group tended to decrease in number when the size of the firm became larger. Yan (2010) carried out an empirical analysis with a panel data from 2004 to 2007, including all Chinese listed SMEs in the manufacturing industry (sample of 202 firms) and found evidence to support a positive relation to firm sizes and the level of debt. Liu and Tian (2009) further confirmed that SMEs in China still face severe 'size discrimination, and this problem is harsher for smaller sized firms than for medium sized firms.

#### **3.5.4.2 Industry**

It is an interesting question to ask whether or not 'industry' plays a part in determining capital structure for SMEs (Jordan et al., 1998). An example was given by Myers (1984); he picked a very profitable firm operating in an industry with low growth. In other words, the firm would have a very healthy level of retained profit on its balance sheet, but a lack of positive NPV (Net Present Value) projects to invest in. Clearly, the firm is bound to have a low debt ratio and it would not make any sense for the firm to borrow more just to bring itself in line with the industry average debt

ratio. The implication was as Myers illustrated, that if the logic was valid, the average debt ratio should vary from industry to industry because of different asset types, asset risks and the need for external finance. A sensible inference was then made by Myers to say the fundamental differences across industries lie with its assets, its need for funds and its growth potential. Therefore, industry is not a meaningful determinant for capital structure.

However, Harris and Raviv (1991) argued that firms within an industry have more things in common and there should be a persistent difference in industry debt ratio over time. Balakrishnan and Fox (1993) then added that industry factors are not nearly as important as firm specific factors in terms of their impact on capital structure. It is particularly true for SMEs who often operate in niche markets, as influences from a broad industry are greatly reduced (Jordan et al., 1998).

Various ways of industry classification was experimented within Wu et al. (2008), for instance, protected versus non-protected, or manufacturing versus non-manufacturing; they were not able to establish a relationship between industry and the change in leverage.

#### **3.5.4.3 Profitability**

Views on profitability being a determinant of a firm's capital structure is divided as the predictions tend not to be consistent. The conflicting predictions of profitability's impact upon leverage have a few different sets of versions of explanations. Pecking order theory suggests that profitable firms have convenient access to retained earnings, which is placed at the top of the pecking order, thus more

profits means firms are less likely to access outside sources for extra finance (Myers, 1984). Jensen (1986) however asserted that there is a positive relationship between profitability and leverage because debt has a function of reducing free cash flow, and therefore can be used as a form of corporate governance control, and consequently reduces the agency cost between owner and managers. Taking the trade-off theory point of view, firms that are capable of generating more profit are exposed to lower risks of financial distress and hence have incentive to use debt financing to take advantage of the tax shields (Miller, 1977; Myers, 2001). Empirical evidence presented by Yan (2010) and Hutchinson (2003) both supported the pecking order theory by finding a negative coefficient on profitability to leverage. A firm's internal capital reserve is hugely dependant on its profitability and because SMEs are often financially constrained, firms with potential to grow may naturally choose to utilise their internally generated funds before sourcing external finance (Myers, 1977). The researcher is moving on to the topic of how growth potential impacts on firms' capital structure in the following section.

#### **3.5.4.4 Growth potential**

Weston and Brigham (1981) applied a life cycle approach to explain SMEs' financial structure. The SMEs have different financing choices and preferences in different stages of their life cycle. In the initial stage, SMEs are seen using owners' own resources to finance the project. In the growth stage, larger variations in the value of the firm that are caused by growth are often interpreted as greater risk. That is why a firm that has considerable growth opportunities will be considered a risky firm and will face difficulties in raising debt capital at favourable terms. This then leads the

firm into the problem of liquidity constraints, which would follow from an over-reliance on short-term finance. The over-reliance on short-term finance would result from the lack of availability of long-term funds, such as bank loans or equity issues.

Furthermore, a firm in the steady stage with predictable and stable cash flows can be financed with debt more easily than a firm with growth potential (Psillaki and Mondello, 1996). Myers (1977) argues that firms with growth potential will tend to have lower leverage. On the other hand, growth will push firms into seeking external financing, as firms with high growth opportunities are more likely to exhaust internal funds and require additional capital. From this point of view, growth is expected to have a positive relationship with leverage, as Michaelas et al. (1999) have already shown.

Setting the preference of sources of finance in a brand new order, Fluck (1999) suggests that firms will issue outside equity, or convertible debt first, then use their retained earnings, and finally issue long-term debt or outside equity to satisfy their subsequent financing needs given a implied life-cycle pattern of firm financing. Interestingly, this pattern differs from the Myers's (1984) pecking order theory in one most important aspect: the firm's initial financing choice.

Overall, growth potential seems to have an impact on firms' capital structure somehow. Yan (2010 pp.7) suggested that "growth might be a more important determinant for SMEs depending on which industry they operate in, whether they have access to the capital market and whether they are micro, small or medium-sized". Hutchinson (2003) recorded that growth is not a very important determinant of SME borrowing - either short-term or long-term and this might be the case where SMEs limit their growth to the finance they have available internally, which is consistent

with the pecking order theory. Similarly, Liu and Tian (2009) found an insignificant positive relationship between growth and leverage. In contrast, Yan (2010) concluded after studying 202 Chinese SMEs that, in general, firms with growth potential included more debt in their capital structure, yet it is far less profound than profit, asset structure, size and age.

#### **3.5.4.5 Accessibility to sources of finance**

Small businesses face a major challenge in resolving the information asymmetry problems, thus influencing their choice and access to external finance (Berger and Udell, 1998; Cassar and Holmes, 2003). The use of external finance by a start-up business is further impeded by the presence of adverse selection and moral hazard problems caused by their lack of proven track record and prior business reputation (Huyghebaert, 2003; Huyghebaert and Van de Gucht, 2007). Wu and Yue (2009) found empirical evidence to show that the leverage ratio was adjusted more easily when the firm had a high level of access to bank loans. In other words, their study suggests that the accessibility to finance can be a determinant of capital structure. In the Chinese context, social capital/connections of the entrepreneur is an unusual but vital determinant for the accessibility to debt financing in particular.

As far as the equity capital market is concerned, a reasonably well-structured and regulated stock market floatation platform should enable SMEs to restructure their capital composition and offers equity financing as an alternative to borrowing if the entrepreneur chooses. As equity finance is a type of long-term financing, access to the equity market can also improve the liquidity situation of SMEs by freeing up

short-term debt to a healthy and sustainable level, hence allowing floated firms to raise finance in a more balanced way in the future (Hutchinson, 2003).

In the next section, the researcher explores in isolation each source of finance available to SMEs and their access to it. Sources of finance are organised into two sub-groups: internal sources and external sources. The advantages and disadvantages of each type of finance and in what circumstances it is likely to be employed by the entrepreneur are also discussed.

### **3.6 Sources of Finance**

The access to finance together with property rights are the two most important barriers for firms' growth (Cull and Xu, 2005). A fascinating and concrete illustration of the liquidity constraints proposition was presented by Adam Smith, who said, using a small grocery store as the background, the owner-manager "must be able to read, write, and account, and must be a tolerable judge too of perhaps, fifty or sixty different sorts of goods, their prices, qualities, and the markets where they are to be had cheapest. He must have all the knowledge, in short, that is necessary for a great merchant, which nothing hinders him from becoming but the want of a sufficient capital (Wealth of Nations, bk.1, chap. 10, pt. 1; quoted in Holtz-Eakin et al., 1994)."

While it is commonly accepted that the problem of the higher cost of external finance compared to internal finance problem is more severe for small firms (Chow and Fung, 2000), an extended careful consideration of the sources of external finance available when money is needed is then crucial in the decision making process. Internal and external sources of corporate funding are discussed separately below.

### **3.6.1 Internal sources of finance**

#### **3.6.1.1 Personal savings and retained profit**

Entrepreneurs who invest personal savings, often referred to as their self-accumulations, into their business venture show their bravery to risk their own capital and also their determination to be good at what they are going to do. The amount of money needed to start a business venture is often larger than their years of self-accumulation; this capital investment is considered one of entrepreneurs' major contributions into the business venture.

In many instances, entrepreneurs have to sell or integrate their personal assets to fund the beginning and the growing stages of their businesses (Van Auken et al., 1996). Since money is always tight at startup, it is very common that homes are used as offices or factories to start with; one can imagine the disturbance there must be to the life of the entrepreneur's family (Landstrom and Winborg, 1997). If there is surplus of cash in the business, the retained earnings would be used for working capital, to purchase fixed assets and for the acquisition of raw materials before they consider withdrawing cash for their personal disposal.

Because small businesses suffer from severe liquidity constraints, dividend payments are rare, in fact, it is hard enough for owner-managers to maintain adequate working capital to run small businesses (Evans and Jovanovic, 1989). Evidence shows that entrepreneurs always satisfy the requirement of working capital before they can comfortably expand their business activities as most bankruptcy cases are the results of a shortage of working capital (Nissanke, 2001).

After they have risked all and survived the initial turbulent stages of the business, to expand business capacity further demands more finance. The bigger the faster the firm grows, the larger the amount of money likely to be sought. Personal savings again at this stage still remains at the top of the 'pecking order', being the cheapest source of finance, and so entrepreneurs are tempted to utilize internally generated funds first before approaching external finance providers (Myers, 1984).

### **3.6.1.2 Family and friends**

Family ties and friendships are the most precious form of social capital that entrepreneurs own in China. The benefit and support they receive from family members and friends is hard to quantify but certainly crucial, especially at the startup stage of the business. Basu and Parker (2001) noted that borrowing money from family and friends are different from bank loans, although small in nature and usually short-term, at low or no interest rates and no pressure on repayments make this form of finance incredibly cheap and suitable when firms experience liquidity constraint. Basically, family and friends do not lend money for profit, but they are looking for some benefits later if there are any (Basu and Parker, 2001). Another characteristic of loans from family and friends is that they are generally offered without screening as private information about the entrepreneur is assumed to be known and the loan offered is based on trust and social ties, thus information asymmetry does not prove to be problematic in this arrangement (Casson, 2003; Hernandez-Trillo et al., 2005).

At the formation stage of the business, the capital requirement for the small business is modest and finance from internal sources, such as the entrepreneur's personal savings, gifts and loans from friends and relations may suffice (Nissanke,

2001). However, from the very start of the business, the pressure is on internally generated sources of capital. This pressure can only keep increasing; as the business grows costs of production and distribution will increase too, more importantly it is crucial to ensure an adequate amount of working capital for day to day operations and the firm's survival. Once internal sources of finance are exhausted, or simply by choice, entrepreneurs would at some stage try to obtain financial support from external sources. The following section examines the external sources of finance that are available and any access issues related to each of them for SMEs in China.

### **3.6.2 External sources of finance**

#### **3.6.2.1 Bank loans**

Allen et al. (2005) indicated that corporate bonds account for less than 1% of GDP in China, therefore, it is reasonable to infer that the public bond market is almost non-existent for SMEs and SMEs mainly rely on bank loans for debt financing (Wu and Yue, 2009). Because commercial banks have the resource, experience and vehicles to provide a wider range of products of credit nature than other financial institutions, the vast majority of small businesses claim commercial banks as their primary loan providers and more often the first point of contact to gain access to external finance (Riding et al., 1994; Berger and Udell, 1998).

Currently, the Chinese banking industry is still dominated by four state-owned specialised banks (the Agricultural Bank of China, the People's Construction Bank of China, the Industrial and Commercial Bank of China, and the Bank of China). They are under the supervision of the Central bank, namely the People's Bank of China

(PBC). This state banking system does not only function as the financial intermediary for the capital market, but also as a quasi-fiscal institution, with the PBC setting both the monetary policies and the prudential regulations for China.

Similar to other transition economies, Chinese banks are mainly owned or greatly controlled by the state (Berger et al., 2006); nevertheless, decentralisation and devolution reforms have been going on since January 1984 when the mono-bank system was first switched to a two-tier banking system. However, because the lending bias in favour of large state-owned enterprises (SOEs) has always existed (Perotti, 1993), bank loans were never fully accessible to SMEs. Factually, the increasing demands for financial services (for instance short/long term commercial credits) resulting from the rapid emergence of non-state sectors, was one of the factors which induced the reform of the financial system (Laurenceson and Chai, 2003).

The planned economy had left China with an unsound banking system, which inhibits bankers to allocate resources efficiently. All state banks are virtually insolvent with large non-performing loans (NPLs) sitting on the balance sheet. Due to the lack of information transparency between the bank and the entrepreneurs, banks do not generally trust the financial information provided by small businesses. To make matters worse, banks themselves are suffering from inefficient and inadequate risk assessment procedures and technologies which will restrict their ability to evaluate and process information to a large extent and, therefore as a result, very few bankers would be motivated to release loans to the private sector. It may sound outrageous but it is perfectly true, the loan officer will be held personally responsible for any defaulted loans he/she had approved to lend to the private sector, yet bears no responsibilities whatsoever when such large amounts of NPLs owed to them by SOEs

remained unsettled (Chang et al., 2009). It is clear that to be able to successfully raise finance from banks, SMEs have to work something rather special.

Due to the urge to secure a stable supply of credit, short-term or long-term, cultivating a good relationship with a few banks can be tricky, time and money consuming for small firms but unavoidable (Chow and Fung, 2000; Berger and Udell, 1995; Ennew and Binks, 1995). Despite all of the efforts put into building good connections with banks, when it eventually comes to business, SMEs are never guaranteed a payback or support from the bank. Nonetheless, relationship lending is still by far the most effective way of improving SMEs' access to debt financing.

In the meanwhile, foreign banks have demonstrated their ardent determination to enter the Chinese market in any conceivable way (Leggett, 2002; He and Fan, 2004). Given the example of Citibank's purchase of a portfolio of outstanding accounts receivables from Ericsson at a discounted price in August 2002, even though the size of the bid was not the centre of the issue, these headlines make people aware of the new opportunities and acknowledge to the public that emerging private banks and foreign banks are potential realistic targets of sources of finance for entrepreneurs.

Empirical studies had suggested that firms that have a higher proportion of non-tradable shares have a higher level of access to bank loans (Wu and Yue, 2009) and there is evidence that the share of bank loans within external sources of finance increases with firm size (Gregory and Tenev, 2001). Although commercial banks appeared to be the second most important source of finance for larger SMEs, after internal finance, only 29 percent of surveyed firms had secured bank loans in the years of study, that is from 1995-1999 (Gregory and Tenev, 2001), hence there is a large scope for improvement in terms of bank financing.

The Chinese central bank (the People's Bank of China) sets a base rate for all commercial banks and has only allowed minor discretion in adjusting the interest rates actually charged to their clients according to risk assessments. Therefore, despite the much higher demand for funds than the capital supply available to SMEs (Jiang and Zhan, 2005), banks cannot raise interest rates to sufficiently compensate the higher risk they have to bear to lend money to SMEs. This is not really helpful to the flow and desirable allocation of the funds there are in the market (Wu and Yue, 2009). As a result, relationship lending and the ability to provide financial guarantors are increasingly important to entrepreneurs.

### **3.6.2.2 Informal credit market**

Given that the real rate of return for bank deposits is extremely low, those who are willing to take risks for higher returns will attempt to act as financial intermediaries outside the formal system. Similarly, to many other countries, where the financial service sectors are repressed, a credit market parallel to the formal banking industry has developed in China (Tam, 1991; Luk, 1993; Tsai, 2002; Goodstadt, 1987).

Informal investment is the dominant external financing source for new ventures in some concentrated parts of China (for instance in Zhejiang Province). Small enterprises can rely on borrowing from the informal credit market for both short and long term financial needs. Yet, owing to the lack of a credible lending system, debtors/investors who operate in those informal financing channels also encounter many problems (Tam, 1986; Mckinnon, 1994; Chow and Fung, 2000).

Nevertheless, there are 'well-organised' unofficial agents, even though they are very difficult to identify and quantify, who have the ability to supply financing at local levels through the 'curb market' (Tsai, 2002). 'Well-organised', here, means that their operations are backed by local political protection and selective enforcement of national regulations according to Tsai (2002) who undertook the first extensive study of informal financing in China. Her study was based on 374 respondents (60 percent response rate) gathered over a period of two years. This study had bravely touched this sensitive and relatively un-researched but nevertheless important subject area, despite the fact that everyone was aware of the existence of informal financing channels. In fact, in some Chinese regions (i.e. in Shanghai), for generations entrepreneurs have traditionally borrowed from the informal credit market and they are able to gain sufficient finance whenever there is need for it (Chow and Fung 2000).

Lin and Sun (2005) modeled a theoretical framework including heterogeneous borrowers and heterogeneous lenders from both informal and formal financial institutions and tried to prove that the separation and co-existence of both informal and formal credit system was a result of optimising behaviours of all parties. According to their paper, information asymmetry between lenders and borrowers can properly account for the extensiveness and characteristics of informal financing.

It is understandable that it would be incredibly hard for smaller firms to obtain loans from elsewhere rather than the informal sources who tend to be local and can lend the money to them based on connections. As a result, smallest firms rely heavily on informal financing channels when they are in need of extra finance (Gregory and Tenev, 2001). Within a geographical radius and among a group of people who are considered 'locals', informal rules could be established based on relationships of trust through reputation and family ties (Cong, 2009). It is known that informal credit

markets can effectively overcome the information asymmetry problem and act as an important means to compensate for the gap in the formal capital market (Tsai, 2002; Cong, 2009).

### **3.6.2.3 Venture capital and private equity**

Venture capitalists bring investors and entrepreneurs together in an efficient manner to make better investment decisions than limited partners and provide non-financial assistance to SMEs that in turn enhance their survival (Gupta and Sapienza, 1992). White et al. (2005) stated that China's venture capital system was initiated from technology policy developments that have gained momentum since the late 1970s. Unconventionally, the main players in the 1990s until early 2000 were government-financed venture capital firms and university-backed venture capital firms.

Before 1992, the main channel for foreign private equity to invest in China was through China Direct Investment Funds (Bruton and Ahlstrom, 2003), whose strategy was to build relationship with large SOEs to source good investment opportunities. It was also pointed out by White et al. (2005) that although foreign venture capitalists and private equity firms were allowed to register as commercial enterprises from the 1980s, it was the lack of suitable investment projects that limited these firms' business activities.

Chinese socialist influences and strong culture created the distinctive social and commercial milieu noted by Boisot and Child (1988), Scarborough (1998) and Bruton and Ahlstrom (2003). For example, value-added activities provided by venture

capitalists, after the funds are injected, are common practice in the West; however, Chinese culture promotes resistance to such activities as it is seen as intrusive (Bruton and Ahlstrom, 2003). It is also frequent that for entrepreneurs engage in ambiguous transactions, that are not intended to be kept in accounts, where personal connections matter more than a company's capabilities (Boisot and Child, 1996; Peng, 2000; Xin and Pearce, 1996; Bruton and Ahlstrom, 2003). Therefore, it may be more suitable to create a venture capital industry with its own idiosyncratic features that is specific to the Chinese institutional setting and culture (Bruton et al., 1999).

Due to inefficient capital markets and asymmetric information, venture capitalists who are normally risk seekers found themselves hesitating as it is hard to play a bigger part in such an economic society (Hamilton and Fox, 1998; Bukvic and Bartlett, 2003; Allen et al., 2005). It is interesting to see how well the venture capital industry has grown in China during recent years and what roles they are playing right now.

According to the annual statistics of ChinaVenture, a research agency specialising in studies of Venture Capitalists (VCs) in China, the top four sectors which attract the most funding from VCs are IT, manufacturing, Internet and healthcare. In sum, they had banked over 60% of the total deals. In 2009, 428 disclosed investments involved a total amount of USD 3.767 billion which represented a downward trend of 20% and 24.8% respectively compared with the previous year, which is in line with ChinaVenture's prediction. VCs continued to focus their investments on first-tier cities making Beijing and Shanghai the biggest beneficiaries of VCs business activities in China, although there appeared a decline in regional concentration. The analysis by business stages had shown that firms at the development-stage (upstarts) demonstrated tolerable risks and foreseeable high

returns and therefore were favoured by investors, whereas a decline was witnessed for those at expansion and profitability stages. It is rather promising that in 2009 both the number and the combined value of deals secured by Chinese VCs saw a steep increase with a share of 25.2% of the total deal value. It is conceivable that resulting from the improved legal frameworks and more favourable business environment, Chinese institutions will come to the fore and China's VC market will become more mature.

In transitional economies, owner-managers of small businesses are often forced to rely on high cost, short-term debt finance and have to satisfy unrealistic collateral requirements in order to gain access to finance. Therefore needs for alternative sources of finance remained strong, if not stronger, considering the fast pace of growth China has enjoyed for over 30 years.

#### **3.6.2.4 Business angels**

Informal private venture investors, so called business angels, are becoming an increasingly important source for business start-up capital. Business angels are a favoured for external finance because they have certain advantages, such as low entry barriers, a quick decision-making process, relatively low return requirements and more flexible repayment terms (Liu and Chang, 2007).

The available funding belongs to single or a group of wealthy individuals who have been constantly searching for investment opportunities in the marketplace. As conditions of the capital market environment have continued to improve and property rights have been assured and reassured by the authorities, business angels gradually have taken over venture capitalists' role by way of investing in the smaller initial

funding stages that VCs had become less and less interested in. These wealthy individuals are to some degree effectively filling the financing gap in the market and are proven to be a great support for young, enthusiastic entrepreneurs who are keen to dip their toes into the ocean yet find it hard to meet VC's higher criteria (Zhu, 2006). Typically, new graduates wanting to set up an Internet venture, who do not require a large sum of capital to get started, will find away to approach angel investors for help (Li and Sun, 2006).

Business angels do not operate without difficulties. Investors have to deal with the whole investment process all by themselves, from screening opportunities, investment management to post-investment monitoring and eventually the realisation of a profit (San José et al., 2005). For instance, business angels face enormous dangers of being defrauded of money. When investors choose to invest in a familiar industry, previous experience in similar businesses can result in a lack of consideration and anticipation, which could then lead to a wrong investment decision. However, the opposite is also risky, since investing in a totally unknown sector of the market would more or less equate to a gamble. Unfortunately, the legal enforcement chain to back up investors is not good enough. In other words, fraudsters can easily breach a contract and escape from obligations and liabilities (Liu, 2009).

Entrepreneurs are more likely to seek funds from business angels after running out of the first round funds (typically made up of self-accumulation and borrowings from family and friends) before VCs become involved if the business is up for a fast expansion (Prowse, 1998). Networking is important to find angel investors for projects and an exit mechanism is even more crucial so that they have the means to cash out on their investments. Existing exit mechanisms include the public offering of shares on a stock exchange, a buy-back from the entrepreneur they had been working

with, an acquisition of the angel's position or of the entire company by a third party and finally if things go badly wrong, the settlement in the liquidation process (Farrel, 1998). In real life, what angel investors really want to see is that the company in which they put their capital at risk, is run professionally and is able to create enough value to attract future investments from other sources, such as venture capitalists. The value of their investment can then be realized once a buyer surfaces or in rare cases the company is ready to go public. Hence, angel investors are not so specific at the initial injection stage about the exit mechanism, but tend to look to the future. In effect, this particular source of finance allows the flexibility the other channels lack.

Generally speaking, venture investments are made in the following stages of a business: the seed stage, the start-up stage, first round, second round, third round and the bridge loan stage (Barry et al., 1990; Lerner, 1994; Manigart and Sapienza, 1999). Research indicates that in US business angels fund 48% of the firms in their seed stage and contribute 20% of the finance at the start-up stage. Their involvement in the later stages of the business is less significant than venture capitalists (Liu and Chang, 2007).

Unlike venture capitalists, business angels use their own money to invest, therefore, are not usually under great pressure to make fast turnaround profit. In China, angel investors on average expect an annual return of 32.5% rather than the 40% profit venture capitalists are looking for (Jeng and Wells, 2000). Business angels usually exit by selling stakes in the company on the private market, while venture capitals, especially private equities are aiming for a high return from initial public offerings or mergers and acquisition deals. Thus, the lower expectation of business angels suits SMEs in their early business stages very well.

Angel investors do not only provide finance, they also offer businesses they invest in a good source of expertise. Some business angels even go as far as taking on a full or part-time post in the company to help the business to get on the right track. Business angel investment is still in the minority in China. There are no official statistics for the scale of business angel investment in China, yet a survey conducted by Qing Ke Co. and Zero2-IPO (two research institutions), and ChinaVenture (Hong Kong) shows that business angel investment only accounted for 8% of total venture investments in 2004. The contribution of angel investment shines a beacon of light through some extremely successful new enterprises that had been funded by angel investors and are now giant Internet firms, for example, SOHU ([www.sohu.com.cn](http://www.sohu.com.cn)) and SINA ([www.sina.com.cn](http://www.sina.com.cn)) who followed very similar routes to success. It is claimed that because the demands for business angel investment from startups are fairly large compared to its market size as it stands today, it is often worthwhile for entrepreneurs to have their projects evaluated by professionals to raise the success rate of getting finance from business angels (Li and Sun, 2006).

Since the supply of capital is not a problem, in fact it is increasing, the top priorities for the development of the business angel investment market are as follows:

- 1) investors should be better equipped with knowledge and skills to identify real opportunities and make rational investment decisions.
- 2) The exit mechanism for business angels is at risk due to the immature capital market and lack of legal enforcement, therefore, it is the financial regulator's responsibility to enhance the investment environment.
- 3) A matching network for business angels and entrepreneurs would be helpful, while still maintaining a low public profile for the angel investors which they have always wished for (Bergemann and Hege, 1998; San José et al., 2005).

### 3.6.2.5 Trade credit from suppliers and customers advances payment

Trade credit exists when the supplier provides goods or services to a customer (the entrepreneur in this case) and does not require immediate payment, yet an agreement is in place so that the customer is asked to pay within a set period of time (typically two weeks, 30 days, 45 days or 60 days depending on the company's invoicing policy) after the goods or services are delivered (Elliehausen and Wolken, 1993; Cuñat, 2007). Supplier's credit is vital to small businesses when liquidity is extremely constrained, and may be a good source of quick cash in situations when firms are unable to raise money through more traditional channels. It is an important source of short-term external finance for SMEs (Rajan and Zingales, 1995).

The severe asymmetric information problem between banks and small businesses tends to be minor between the entrepreneur and his/her suppliers. Through trading history and established business relations, the entrepreneur's personality and business style is known to the supplier and so when trade credit terms are negotiated, information problems can be alleviated by the private information held by suppliers about their customers (Burkhart and Ellingsen, 2004). Suppliers, by the nature of their relationships with the small businesses, have an information advantage over banks and are therefore more able to ensure prompt repayment than banks can (Mateut et al., 2006).

A supplier can identify a prospective default more quickly than formal credit providers and supplier's credit is reviewed periodically and can be extended on a more regular basis to SMEs with good track records of payment, and usually at no

cost and with minimum paper work (Walker, 1985). Hence, small businesses which are more likely to be credit rationed and do not have sufficient access to formal financing channels tend to rely more on trade credit (Cull et al., 2009). Ge and Qiu (2007) have done studies on overdue trade credit and the maturity structure of trade credit; they indicated that the greater use of trade credit by non-state owned firms is primarily for financing purposes, which partly proved the credit rationing phenomena as well.

On the other hand, customer advances is a form of accrual payment made by a customer to the supplier goods or services in anticipation of delivery on a future date. A customer may agree to pay in advance for membership fees, loyalty cards and/or making advance payments on service contracts (Freear et al., 1995; Kumer, 2008). For exporting firms, letters of credit for foreign transactions is also a common form of advance payment (Stevenson et al., 1985).

#### **3.6.2.6 Equity**

Equity and bond markets in emerging markets are often not yet developed or in their infant stages of development. The establishment of two securities exchanges in China, one in Shanghai opened on 26<sup>th</sup> November 1990 and the other in Shenzhen opened on 11<sup>th</sup> April 1991, is a new economic experiment. Despite the vast improvement in the last two decades, the potential funding power that equity markets traditionally provide is not yet utilised satisfactorily. This is particularly the case for SMEs. The market is still trying to recover from a continuous 13-month slide that destroyed almost 75% of market value up to 18<sup>th</sup> December 2008 (Jiang et al., 2010; He et al., 2009). Too many issues need to be addressed before the dysfunctional

securities markets can be brought back to life and operate as an attractive funding source to entrepreneurs.

Looking at SMEs in particular, asymmetric information problems have been a major contributor to exclude SMEs from bond and equity markets (Chow and Fung, 2000). In practice, tight regulations and listing rules restrict the majority of private enterprises from listing on the exchange. Furthermore, to comply with the rules can be very expensive too. It is common knowledge that Chinese entrepreneurs, especially family businesses do not favour the idea of diluting ownership and being interfered with when making decisions for their own businesses. This cultural shock is not impossible to overcome, however very much depends on the existence of an attractive, efficient and more mature equity market.

Entrepreneurs who want to raise funds from the general public have very tough requirements to meet and it is a very complicated process. The following is simply a list they have to consider before a listing can be scheduled on the agenda. They need to: (i) adopt more transparent reporting methods; (ii) present a value-added perspective of their own firm in front of investors; (iii) sharpen corporate finance and corporate governance skills; (iv) maximise the intangible asset of 'network capitalism' by widening the *guanxi* (connections) circles (Gibb and Li, 2003; Boisot and Child, 1996); and (v) any business anticipation should comply with listing rules and all relevant regulations. Boutron et al. (2007) offered a similar view with less emphasis on SMEs.

On the other hand, firms which go for listing on international stock exchanges (usually the Hong Kong Stock Exchange, New York Stock Exchange or London Stock Exchange) show great confidence in their firms' profitability and future

prospects. They perhaps are more likely to have been supported by venture capitalists in the earlier stages of their businesses (such as the cases of SOHU and SINA). Because foreign investors are better informed about their performance, they are willing to tolerate higher risks for higher returns.

It is exciting to report a piece of good news for Chinese SMEs, which was, at the end of 2009, the opening of the Shenzhen-based ChiNext exchange, also known as the 'Growth Enterprise Market'. It has been considered as a breakthrough for China's smaller, technology-focused companies (Lan, 2009). The opening of this specific equity market was a breath of fresh air, in the sense that it made equity financing more reachable to medium sized enterprises with much lower entry requirements than the main board. So far, 90 firms have been listed on the market with very promising daily trading volume achieved, which shows the great strength of the Chinese equity market has been comfortably extended to this small board (Takeshi, 2009).

After gaining insights into each of the sources of finance there are available in the capital market, it is then interesting to know whether or not firms have a preference order to follow when there is demand of finance from a positive NPV project. The researcher will move onto another very practical theory in finance in the next section, which is the pecking order theory proposed by Myers (1984).

### **3.7 The Pecking Order Theory**

Myers (1984) and Myers and Majluf (1984)'s pecking order theory suggested that SMEs finance their investment in a hierarchical way. The implications of the pecking order theory are that firms rank the sources of finance available to them and

will first exhaust internally generated financing before making contacts to external financing. Once the internal financing is depleted, debt financing will be the second choice followed by equity financing as the last resort. This preference reflects the relative costs of the various sources of finance. When internal and external finance are no longer perfect substitutes in the presence of imperfection in the capital market, a firm's investment decision will be constrained by the availability of internal funds (see Fazzari et al., 1988; Hoshi et al., 1991; Fazzari and Petersen, 1993; Athey and Laumas, 1994; Chow and Fung, 2000).

According to Myers (1984), capital structure has no optimal debt ratio and if there is, it is insignificant as compared to the cost of external financing. Entrepreneurs have superior information about the prospects of the business than outsiders and this information problem makes raising external finance a costly practice (Baker and Wurgler, 2002). The Securities and Exchange Commission (SEC) data suggests that SMEs are expected to face a higher cost in accessing external funds compared to larger firms. Transaction costs consumed nearly 19% of the gross proceeds of small stock issues and about 14% of the proceeds of small debt issues. These costs could have created a significant financing hierarchy for the smaller firms (Oliner and Rudebusch, 1992).

As far as the adverse selection problem is concerned, retained earnings avoids all of the problems associated with adverse selection. Though debt financing is not without problems, equity financing has serious adverse selection problems. Thus, the logic for investors is that if equity is riskier than debt they should demand higher rates of return for equity investment than on debt (Myers and Majluf, 1984; Frank and Goyal, 2003).

The reason why equity is at the bottom of the pack is also due to the high cost and complicated requirements associated with floating shares on the stock market and the possibility of having to sell shares under market value if the Initial Public Offering (IPO) turns out to be unsuccessful (Buckland and Davis, 1990). More importantly, small businesses do not favour the use of equity finance because share flotation will mean entrepreneurs are giving away part of their ownership of the company to a much wider general public and the probability of losing control over their business increases (Chittenden et al., 1996). Because the capital required to take over a small business that is floated on the market is relatively small, and the share price is seen as an apparent guide price for the value of the firm, a hostile takeover can be exercised much easier than attacking a fully enclosed small firm.

In practice, although firms would like to run with debt ratio equal to zero in an ideal situation, that is to finance completely with internal funds, only a very small number of older, mature firms are likely to achieve a well-established source of internal equity. Young, small and or growing firms, that lack their own resources, will have no choice but rely on external financing (Swinnen et al., 2005). Myers' pecking order theory implies that a company's real debt ratio varies over time, depending on its needs for external finance and the availability of cash flow. For instance, a profitable firm generating slow growth will end up with a low debt ratio, whereas unprofitable firms with fast growth can exhibit high debt ratios. Unfortunately, firms are not able to borrow indefinitely. Once they eventually reach full debt capacity, they are forced to finance their positive NPV projects with equity to make more profit, if profit maximization is the ultimate goal of the company.

However, a more complex view of the pecking order model suggests that when firms take into consideration future growth opportunities, rather than simply

looking at short-term profitability, they may favour a low debt ratio and open the channel for equity financing, as reserve borrowing capacity is valuable (Myers, 1984). Therefore, given the special cognitive style of management in SMEs (Sadler-Smith, 2004), one will wonder whether the behavioural principle explains more of the financing choice of SMEs than the trade-off and the pecking order theory, yet, no evidence had been found to support such proposition (Swinnen et al., 2005).

Evidence from China strongly supports the simple form pecking order theory. A survey of more than 600 private enterprises operating in 4 cities in China was conducted in 1999 by the International Finance Corporation and the World Bank Group. They found 80% of the sample expressed the view that access to finance is a serious constraint to their businesses and more than 90% of the start-up capital came from the principle owners and their friends and families (Wagle et al., 2000). Further investments still heavily depend on internal sources with 62 % of the funding raised internally (Gregory and Tenev, 2001).

If the market is known to be imperfect and it is also clear that financing is the most serious obstacle that hinders SMEs development, who is there to make the changes for the better? When the 'invisible hand' fails to do its job, government intervention comes into play. Being small, SMEs are no doubt hugely influenced by monetary measures and the macroeconomic condition of the country in general. Therefore, in the next section, the researcher would like to update the reader with some examples of recent interventions the Chinese government has introduced in the market.

### **3.8 Policy Influences and Financial Support from the Authority**

The role government plays in assisting the development of SMEs is not to be ignored. The small business sector, which had long been recognised as the seedbed (DTI, 2004) of economies, is like an area of new turf that requires tender and constant care from the gardener (the authority). It is the government's responsibility to work the macroeconomic mechanism and ensure that it will bring a fair competitive environment for SMEs. Regrettably, the scale had been tilted towards the state-owned enterprises (SOEs) side deliberately by the Chinese government for many years, and inevitably, it will take time to alter the policy imbalance and, more importantly, adjust attitudes in favour of SOEs in the credit market (Chen, 2006).

It is recognised that China will need to expand its special funds for SMEs and focus allocations on innovation, structural adjustments, emission cuts, market expansion and job creation. It is said by Mr. Yizhong Li (Minister of Industry and Information Technology of P. R. China) that as a result of segmented distribution government support for SMEs was not enough (Li, 2010). To tackle the financing difficulties SMEs face, in 2009, the government not only widened credit channels for SMEs, but also earmarked 10.89 billion yuan (\$ 1.59 billion) from the central budget to support SMEs' development, which is more than double the budget compared to 2008.

In response to arbitrary charges (red tape) that had been randomly and aggressively levied on small businesses in the past, China has promised to implement a strict public notice system aimed at regulating charges collected from SMEs. In 2009 alone, 100 administration-related charges worth 36 billion yuan were removed. Li also said that: "The government is determined and all administrative and

governmental charges that were not approved shall be lifted to relieve the burden on SMEs” (Li, 2009b).

Finally a series of preferential fiscal and tax measures will be introduced to not only show the initiative of giving full support to SMEs from the authority side, but also to be beneficial to small business in real terms. According to a recent announcement made by the Ministry of Finance and the State Administration of Taxation, small low-profit generating enterprises with an annual taxable income less than 30,000 yuan (\$4,394) can reduce their taxable income by 50% and pay corporation tax at a rate of 20 percent from 2010 (Report on the Work of the Government, 2010). Financially stressed small businesses would still be able to defer social security charges for their employees and be able to pay employee insurances at a lower rate until the end of 2010.

### **3.9 Conclusion**

A selection of the most important finance theories that are associated with the reasoning behind SMEs’ financing difficulties were reviewed in this chapter. It covered milestone literatures in finance, including the market efficiency hypothesis, information asymmetry, agency theory, the capital structure and the pecking order theory. These theories laid a solid foundation for establishing the purpose, the direction, the survey questions and the analysing techniques that are most suitable to this PhD project. The researcher has also paid particular attention to recent government measures that are influential to SMEs’ financing in China aimed at linking theories to practices. The next literature review chapter is designated to the core problems confronted by small businesses in terms of getting access to finance, namely credit constraints and credit rationing.

## **Chapter 4:**

### **Credit Constraints and Credit Rationing**

#### **4.1 Introduction**

The previous chapter reviewed important theories in finance, with particular attention paid to the financing of small businesses. More specifically, Chapter 3 outlined market efficiency hypothesis, the capital structure, sources of finance and the problems associated with access to finance for SMEs. Financial constraints continue to be the key hindrance to the performance, growth and development of the small business sector. A chapter designated to credit constraint and credit rationing is crucial due to the severity of SMEs' problems of access to finance and is an essential part to fulfill the objective of this research, that is to investigate the financial constraints experienced by small businesses in Beijing.

Despite the fact that all relevant parties including policy-makers, finance providers, scholars and entrepreneurs are fully aware of the difficulties small businesses encounter in accessing external finance, in particular obtaining bank credit, the intended goal to solve or simply to ease the discouraging impact of credit constraints and credit rationing has been hard to accomplish (De Meza and Webb, 1992; Sowa et al., 1992; Levy, 1993; Parker et al., 1995; Berger and Udell, 2002; Wu and Tan, 2005; Zhao et al., 2006). Credit rationing has been a universal problem in both developed and developing nations. It is acknowledged that the challenges confronting small businesses in accessing finance have been attributed to the problems of information asymmetry (Akerlof 1970) which further leads to the credit rationing phenomena (Stiglitz and Weiss, 1981; De Meza and Webb, 1992; Winker, 1999; Fioretti, 2005).

“The discrepancy between China’s economic structure and financial structure is best manifested by the mismatch between the contribution of SMEs to economic growth and the amount of credit they have obtained from formal financial institutions” (Shen et al., 2009 pp3). Therefore, the researcher was motivated by the necessity to investigate to what extent SMEs are credit constrained and how serious the problem of credit rationing is in China. Due to the geographical size and regional differences in China, it is believed that studies should be performed separately within manageable and reasonably selected regions (Li et al., 2005). Hence, this study is based in the capital city, Beijing.

The limited empirical literature on the financing of Chinese SMEs suggests a reliance on non-market sources of finance and a perception that restricted access to bank finance may be constraining growth and development. This sharpens our interest in the demand and supply of credit to Beijing SMEs. It would also be interesting to know which particular type of entrepreneur is actually credit rationed (Amano, 1999) and what type of firms are more likely or less likely to be credit rationed (i.e. innovative firms vs. non-innovative firms). The researcher intends to look for empirical evidence to fill gaps in the literature about small businesses financing in China.

The chapter is organised as follows. The researcher first addresses the relationship between financial market imperfections and firm investment to give the reasoning behind credit constraint. Later the conceptualisation of the concept of credit constraints is presented with regards to definitional issues, the credit constraint equilibrium and discouraged borrowers. Thirdly, the phenomenon of credit rationing is investigated extensively with particular attention paid to the market anomalies which resulted from information asymmetry and are associated with lending decisions

(namely adverse selection and moral hazard problems). The credit rationing equilibrium model is then illustrated and criticisms of this model are also discussed. After addressing relationship lending, the researcher moves on to explain the importance of the use of collateral in lending decisions. Small business entrepreneurs' access to finance is discussed in isolation and three hypotheses are developed in this subsection. Next, empirical evidence from studies that focus on developing and transitional economies is presented to compensate for the lack of previous studies in China. Finally, a conclusion finishes Chapter 4 on credit constraint and credit rationing.

#### 4.2 The Relationship between Financial Market Imperfections and Firm Investment

When firms make an investment decision, they face a choice of financing the project using internal and/or external funds. Neoclassical theory of firm investment (Modigliani and Miller, 1958), which was reviewed in chapter 3, said that in a perfect market, where there are neither transaction nor information costs, internal and external funds are perfect substitutes as far as investments are concerned. Under the same assumption, firms should also have unlimited access to sources of finance. Hence, there should not be any constraints of a financial nature.

Nevertheless, this all well and good hope for a perfect market fails by and large in the presence of asymmetric information (Myers and Majluf, 1984). SMEs are especially vulnerable to information problems as the way small businesses are run is characterised by their closely held nature. As a result, insider information, such as the profitability and risks associated with investment projects is not properly and

completely shared with external finance providers. Typically, once the loan is granted to the entrepreneurs, as long as they keep up with interest payments, the creditor loses control over how their capital will be used. In addition, loan default costs and bankruptcy costs can only make the case worse for the creditor if things do go wrong. Thus, to avoid putting their capital in the hands of “lemons”(Akerlof, 1970), not only banks but also external finance providers in general, tend to ration credits made available to economic sectors that are prone to more serious information asymmetry and are deemed to be more risky. Unfortunately, SMEs fall into this disadvantaged category.

Therefore, if finance is inadequate, positive NPV investment projects cannot be fully funded. Valuable investments for the economy as a whole will be held back by financial constraints, not to mention that if SMEs are considered the engine to drive our troubled global economy out of the recession, lack of fuel (finance) is certainly detrimental.

It is often reported that SMEs operating in developing countries or transitional economies face severe difficulties in fulfilling the financial needs for their businesses (Lin and Sun, 2005; Du and Girma, 2008). This is largely due to the underdevelopment of the financial systems and institutional settings, although the operation of a parallel informal financial system may compensate to a degree (Stiglitz, 1990; Arott and Stiglitz, 1990). Firms who wish to snap up opportunities in the market, to advance their product and services and/or expand their businesses requires external financing. The hard demand for financing investment projects from the private sector is not to be ignored. In the next section, a model for financial constraints based on the demand and supply for funds is presented with the intention of explaining the existence of financial constraints.

### 4.3 The Explanation of Credit Constraints

Because of the fact that financial markets are not perfect, financing investments depends on both the cost of finance and the availability of finance. The existence of financing hierarchy, more famously known as the “pecking order” defines the pattern of financing preferences when firms want to invest (Myers, 1984). Different financing sources have different associated costs. However, simply taking the cost of finance into consideration is not enough. The combination of how much money a firm wants to raise, and what they can afford to lose (i.e. a stake or some control of the business) or pay (i.e. interests and dividends) only depicts the demand side of the story. Finance providers’ willingness to invest or lend their money to the business is equally if not more important. SMEs’ inability to obtain sufficient finance, which can certainly inhibit their growth, is a good example of a supply gap in the financial market.

Pecking order theory argues that internal funds are cheaper than external funds and because the financial market is predominantly the source of external finance, the availability of cash flow and internal funding options are not discussed here. External finance can be in the form of either equity or debt (if convertible debts are not considered for simplicity’s sake). Access to equity has long been recognised as a problem (Macmillan, 1931; Radcliffe, 1959; Bolton, 1971). More recently, access to debt, more specifically the terms on which debt is available to small businesses, raised a lot of concerns for policy makers, practitioners and businesses (Binks and Ennew, 1996). Furthermore, because equity financing is seldom a feasible option for small businesses to raise funds, due to its expensive nature and the immaturity of the stock market in developing nations, the researcher will place her emphasis in this study on debt financing. Therefore, the topic of this section will be credit constraints instead of

the more general term - financial constraints, and credit rationing which looks at the supply side of the phenomena and is discussed in the following section in this chapter. Next, the researcher is going to review definitions and models aimed at explaining credit constraints intuitively and identify variables from classic investment models that can be included in the survey questionnaire.

#### **4.3.1 Definitions of credit constraints**

Ex-ante credit constraints result in the prevention of entrepreneurial talented individuals starting businesses and in profit generating investment opportunities being turned down (Boucher et. al, 2006). On the other hand, ex-post credit constraints restrict the liquidity of firms' cash flow and impact upon the production outcomes from investments already made being realised (Eswaran and Kotwal, 1989; 1990). In both situations, given debt is a cheaper form of financing than any other source except retained profits, credit constraints are seen as a major setback to firms' formation and development.

Depending on the focus of the studies being carried out, varied definitions of credit constraints have been adopted. However, there was a less obvious trend of the definition which started as a narrow concept and was gradually broadened to cover this problem more realistically. To present a few examples, both Jappelli (1990) and Crook (1996) defined a credit constraint as a situation when the borrower's request for credit was rejected completely and/or was expected to be turned down. Later, Jappelli et al. (1998) redefined a credit constraint to not only include cases that had been turned down by a lender but also cases when the lender was unable to offer as much credit as the applicant requested for. A more conclusive and a more detailed

definition was recently presented by Fletschner (2008) who argued that a credit constraint occurs when a borrower's request for a loan is completely refused, or only a smaller amount is obtained, or the borrower decides not to apply or requests less than they wish to borrow because they believe they will not obtain the full amount. It was particularly pointed out that businesses could face situations when there is no offer of a large amount of a loan in the entire credit market even if they are willing to bear a higher interest rate (Guiso, 1998).

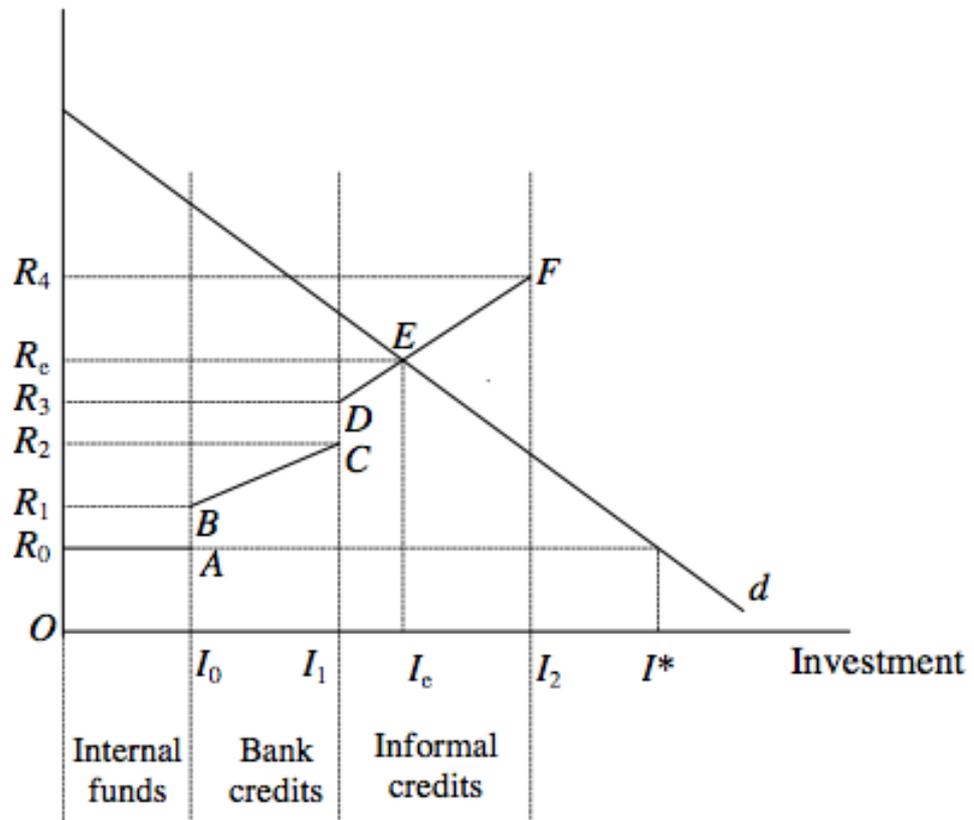
#### **4.3.2 Investment and financing equilibrium: an illustration**

As mentioned earlier, if we do not consider the possibility of firms gaining access to equity finance and look at all other types of financing collectively, according to the pecking order theory and the concept of credit rationing, a graphical model can show how firms end up with credit constraint when there is demand for external finance (please see figure 4.1).

Figure 4.1 depicts the demand for and supply of finance when a firm faces investment opportunities within a given period of time. On the diagram,  $d$  is the investment demand curve that represents a firm's demand for funds. The reason why the demand curve is downward sloping can be explained by two arguments. Firstly, the marginal return on investment is diminishing, in other words, the firm is assumed to invest in the most profitable projects before having to turn to less profitable ones. Secondly, as the cost of finance goes up, the demand for finance reduces.

**Figure 4.1** Demand for and supply of finance

**Cost of funds and investment rate of return**



Source: Ninh (2003, pp.73) - Adapted from Hubbard (1998, pp. 196)

The position of the  $d$  schedule is determined by the investment opportunities there are available to the firm. This  $d$  schedule is a smoothed investment opportunity schedule (Weston et al., 1996), in the sense that if the firm has a very small number of relatively less risky (less profitable) investment opportunities,  $d$  would be close to the origin  $O$ . Hence, the chances are that these investment opportunities can more or less be financed by internal funds ( $R_0A$ ). On the other hand, when the firm is seeking to fund a number of riskier and high-return investment projects, the  $d$  schedule should

shift outwards, thus external financing becomes actively involved in the equation. Bank loans and/or informal lenders would contribute to the supply of finance.

Assuming no tax advantage on the cost of debt, the supply of finance is represented by a discontinuous schedule  $R_0ABCDEF$ . To signify the different level of costs associated with different sources of finance, the supply curve is separated in sections according to the pecking order theory. The first source a firm will resort to is internally generated funds, which is represented on the diagram as a horizontal line  $R_0A$ . A constant shadow cost ( $R_0$ ) will always occur with the use of internal funds (Carpenter and Petersen, 2002). The next source of finance in the financial hierarchy is bank credits and the increase in the cost of finance from internal funds to bank credits is reflected in the jump from  $R_0$  to  $R_1$ . The supply schedule has also jumped from  $A$  to  $B$ . The upward slope of the funds supply curve  $BC$  is due to the fact that as the amount of loan borrowed increases, the banks will require and will charge a risk premium; thus, higher interest rates will pertain until the point where they begin to ration credit (say,  $R_2$ ). The final portion of the supply curve,  $DF$ , represents the supply of funds offered by informal creditors. Similarly, informal credit markets in general are considered more costly than bank credit as they tend to assess and lend to applicants who have been rejected by commercial banks, thus the cost of finance jumps again from  $R_2$  to  $R_3$  as a starting point. The interest rate will also rise as the amount of the loan borrowed goes up to a level ( $R_4$ ) where credit rationing appears and cuts off the supply curve once more. Both formal and informal lenders ration credit to avoid a decline in their expected return. The concept of credit rationing introduced by Stiglitz and Weiss (1981) will be thoroughly discussed in a later section in this chapter.

As it is illustrated on Figure 4.1, it is also worth noting that the firm can finance investment projects up to the level of  $I_0$  without seeking external finance. The cheapest interest rate banks offer is  $R_1$ , therefore, it is not financially viable for firms to borrow unless the investment rate of return covers this minimum required rate of interest. Investment projects that generate low returns, typically between  $R_0$  and  $R_1$ , will either be given up by the firm or financed by somehow stretched internal funds which will increase the length of the portion of the supply curve ( $R_0A$ ). As a result, a sensible inference can be drawn and that is investment decisions are sensitive to the availability of internal funds (Carpenter and Petersen, 2002).

An example of a demand and supply of funds equilibrium ( $I_e$ ) is shown in Figure 4.1 at a position where all three sources of finances (namely internal funds, bank credits and informal credits) had been utilised at a given level of demand to invest. In other words, an investment and financing equilibrium is found.

The credit constraint is clearly shown on Figure 4.1. The equilibrium investment  $I_e$  is smaller than  $I^*$ , which is the level of investment a firm should be able to accommodate fully at a constant cost of  $R_0$  in perfect financial markets where a firm can have unlimited access to funds for investment.

The persistence of credit constraints and credit rationing has been a widespread problem across nations, and it could be detrimental to the market sentiment and confidence towards a fair and efficient financing environment for enterprises (Binks and Ennew, 1996). Entrepreneurs will inevitably face financial constraints at some stages during their firms' business cycle. They need every encouragement and support from finance providers to be able to facilitate worthy investments and to retain their going concern status. Unfortunately, some of them

could be discouraged by their past experience or be affected by the negative sentiment in the market. The issue of discouraged borrowers will be investigated next.

### **4.3.3 Discouraged borrowers**

Bluntly speaking, in the money market, lenders make money out of borrowers. Yet, because lenders' resources are limited and the security of loan capital that they lend to debtors is vital and matters to their own survival, risk is something they have to live with and try very hard to assess and mitigate. Once lenders hand over the agreed loan amount to the borrower in the form of cash, despite the fact that they are very likely holding some forms of securities or collaterals against this loan, when it is necessary for them to demand the repayment of the loan for whatever reasons, the situation is less than straightforward and often the process is going to be time consuming and very costly (Voordeckers and Steijvers, 2006; Andreas, 2006). Therefore, both demand and supply sides are facing possible discouragement with severe information problems at the loan application stage, resulting in bigger financing gap in the market.

Crook (1996, 1999) tried to identify the characteristics of discouraged potential loan applicants (individual people), who in practice are more likely to have a credit constraint problem. He found a positive relationship between the probability of being discouraged with individuals who have missed two consecutive installments in the last year, or who is black, or who is Hispanic or who is a single female living on her own. In addition, the number of economic dependents appears to be positively related to the probability of being discouraged. At the firm level, studies were performed in the US which discovered that two-thirds of the firms that were credit rationed between 1988 and 1989 were discouraged from applying by their expectation

of rejection and a further 2.17% of total sampled firms experienced delays in obtaining external finance (Levenson and Willard, 2000). It is also recognised that smaller firms, especially micro enterprises have virtually no access to the formal credit market and also face severe rationing constraints in informal credit markets, therefore more prone to become discouraged borrowers (Mushinski and Pickering, 2007).

Although the definitions of discouraged borrowers vary depending on the investigator's view point, generally speaking, discouraged borrowers' decisions of not to apply for credit are mainly due to a fear of rejection (Crook, 1999; Kon and Storey, 2003). This is not only a psychological hurdle, but also a manifestation of market imperfections. In real life, potential borrowers who have the need for credit and are happy to pay the relevant price, may well be prevented from applying for these credit because of the terms and conditions imposed by lending institutions (Atieno, 2001).

The buy-to-let mortgage in the UK can be used as a good example to illustrate the discouraged borrower phenomena as it is something which is closer to everyone's life. A first time buy-to-let mortgage borrower has huge barriers to overcome before he/she can successfully secure his/her very first buy-to-let mortgage. The terms and conditions typically imposed by mortgage lenders on the potential borrowers are: there must be a minimum annual income requirement, they must have a mortgage repayment history, must not be a first time buyer, must use their main residence as collateral, and must not let to occupants of multiple households. Usually, lenders will charge an arrangement fee which is at least double compared to the fee charged for a normal residential mortgage (please refer to bank or building society web-sites for current figures). Unsurprisingly, new entrants and less experienced landlords are discouraged, yet professional landlords will benefit.

Even though the way lending institutions handle different types of credits they have on offer are different, SMEs that lack track records and do not have collateral to put down are more likely to be disadvantaged compared to their larger counterparts and so discouraged from borrowing the funds they need. It is necessary to look into the issue of credit rationing more carefully now, so that more could be found out about the operation and behaviour of SMEs' most important finance provider, commercial banks (Ruis et al., 2009). This leads the researcher on to the next section focusing on credit rationing.

#### **4.4 The Concept of Credit Rationing**

Firms' difficulties in resorting to external finance are increased in an imperfect information setting which is typically associated with problems like adverse selection, moral hazard, excessive monitoring and enforcement costs of debt contracts (Russo and Rossi, 2001). Given that the bank is the most important source of credit for the private sector, this is particularly true for smaller and younger firms and suffering from severe credit constraints limits SMEs growth capability dramatically (Wagenvoort, 2003; Beck et al., 2006).

Because the expected return to formal lenders (e.g. banks) depends on the repayment probability of borrowers, the price (e.g. interest rate of loans) lenders charge has to compensate for the risks they bear, unlike in a spot market, where goods are paid for immediately at a given price, which equals the expected return to the seller. Despite scholars' continuous efforts, risk premium remains an unsolved puzzle in finance (Weil, 1989; Sarig and Warga, 1989; Ewing, 2003). From a lender's point of view, although he/she can charge a higher interest rate to reflect the risk premium,

the interest rate itself has a counter-effect on the repayment probability (Hoff and Stiglitz, 1990). It is rather clear that there is no easy answer to this dilemma, and as a result, credit rationing has become a common phenomenon in credit markets.

#### **4.4.1 Definition of credit rationing**

Though commonplace and apparently well understood, the term ‘credit rationing’ is taken to indicate a variety of conditions in the academic literature. One common (perhaps standard) definition of credit rationing is: “the situation where some loan applicants are denied a loan *altogether*, despite (i) being willing to pay more than banks’ quoted interest rates in order to obtain one, and (ii) being observationally indistinguishable from borrowers who do receive a loan” (Parker, 2002, p. 163). This has been termed as ‘Type II’ credit rationing (Keeton, 1979). In practice, it is difficult to establish, given, among other things, obvious difficulties in establishing willingness to pay interest rates above banks’ quoted rates. Accordingly, this study is concerned, instead, with Type I credit rationing. In this case, all or some firms receive a smaller loan than they would otherwise wish at the quoted interest rate. Thus, we define a firm to be credit rationed if, at the prevailing rate of interest, it seeks to access a larger amount of credit, but cannot obtain it (Guiso, 1998). Clearly, in such circumstances, banks are literally rationing credit on some basis other than price.

In order to complement the argument above and complete the review of this subject matter, Table 4.1 shows a few directly quoted definitions of credit rationing used by previous studies. In spite of the different terminologies used in the definitions listed in the table 4.1 below, they can still be summarized comfortably into the two main streams proposed by Parker (2002) quoted above.

**Table 4.1** Definitions of credit rationing in previous studies

<b>Authors (year of publication)</b>	<b>Definition of credit rationing adopted</b>
Baydas et al. (1994)	“occurs when lenders grant the loans demanded by applicants who are identified as creditworthy borrowers while granting loans smaller than demanded to some applicants and completely rejecting other applicants willing to pay the interest rate demanded” (pp. 280).
Turvey and Weersink (1997)	“occurs when lenders face a demand for credit that exceeds the amount they are willing to lend at the prevailing market rate” (pp. 202).
Pruteanu (2004)	“occurs whenever borrower’s demand for credit is turned down, even if this borrower is willing to pay all the price and non-price elements of the loan contract” (pp. 59). Taken from Freixas and Rochet (1997).
Nykvist (2008)	Credit rationing: “circumstances in which either among loan applicants who appear to be identical some receive a loan and other do not, and the rejected applicants would not receive a loan even if they offered to pay a higher interest rate” (pp. 394). Taken from Stiglitz and Weiss (1981).

#### **4.4.2 The importance to understand credit rationing**

If we are to consider the financing difficulties small businesses confront in their day-to-day operations, we need to study credit rationing for three reasons. Firstly, an understanding of the nature of credit rationing will assist us to better anticipate to what extent credits are inefficiently allocated (Blumberg and Letterie, 2008). Secondly, the entire array of market behaviours, which would be influenced by interest rate elasticity and issues of credit allocation, can be explained more logically, therefore better understood by policy makers and practitioners (Vandell, 1984). Thirdly, investigation into credit rationing in the market will reveal various market imperfections and so guide the transmission of monetary policy with the intention to ease or solve the problems. Even if the money supply is not important enough to the entrepreneurs (as some of them do have sufficient funds to run their businesses for the time being), the possible changes in monetary policy due to the effect of credit rationing should make everyone cautiously alert (Mateut et al., 2006; Inderst and Muller, 2007).

Some scholars have argued that provided that the price is sticky, monetary policy maybe more suitable to be implemented through a rationing channel rather than through an interest rate channel (Roosa, 1951; Scott, 1957). However, any restrictive monetary policy on money supply tends to restrain bank credits that are available to borrowers (Scott, 1957).

Hodgman (1960) has tried to show that a bank's decision on the credit supply to an entrepreneur could become perfectly inelastic or even backwards bending. In other words, once the loan reaches a certain level and a particular interest rate is set for a loan, the possibility to increase the price will not induce the bank to extend the

size of the loan. Because of the presence of a default risk and the assumption that the entrepreneur's repayment ability is finite, a higher interest rate for the loan will not compensate the bank for the increase in default risk, thus the size of the loan has a limit too (Hodgman, 1960). The above argument explains why credit supply to an individual entity is limited, and the supply of credit is never determined just by the demand for it and the price borrowers are willing to pay. However, Hodgman's proposal has raised numerous criticisms on the grounds that entrepreneurs' repayment ability might be dependent of the size of the loan (Chase, 1961; Miller, 1962). Therefore, if banks perform their due diligence and are able to assess investment returns more accurately, they would be able to more or less arrive at the same conclusion as the entrepreneur about the investment opportunity and so credit is unlikely to be rationed. In reality, banks would then complain that they do not have access to sufficient information, or information can be deliberately hidden. Thus it is not possible for them to be fully aware of the risks they face and credit rationing is an inevitable result due to the presence of information asymmetry in a competitive market (Arrow, 1963).

Since the issue of information has been brought into the spot light again, the researcher would like to refresh the memory of the reader about the information problems entrepreneurs face when sourcing finance. Particular attention is paid to the attitude of banks in their decision making process.

#### **4.4.3 Information and banks' lending decisions**

Previous researchers have made attempts to put credit rationing in the information framework and so be explained by the existence of market imperfections

(Stiglitz and Weiss, 1981; Williamson, 1986; Ariccia and Marquez, 2004). It is true that the knowledge or the possession of information influences people's actions, especially when there are decisions to be made. Information asymmetry arises when some people own superior information to the others and therefore not all involved parties possess the same attitude towards a common goal. The theoretical groundwork outlining the concept of asymmetric information was laid by George Akerlof (1970)'s lemons theory, Michael Spence (1973)'s signaling model and Joseph Stiglitz (1975)'s screening model. The contribution of these seminal works is that they created debates and formed a foundation to enable the development of future researches in almost any direction (i.e. in business, finance, management and entrepreneurship). Giving an example in the light of recent research in entrepreneurship, when market imperfections are carefully studied and thoroughly observed, opportunities to build the theoretical foundation for the modeling of *sustainable entrepreneurship* become possible (Cohen and Winn, 2007).

Akerlof (1970) argued that the seller of a product would have private information about the product he sells of which the buyer is not informed, and therefore it is possible that the seller has an incentive to sell inferior goods to the buyer. As a result, the uninformed party should look for signals that would offer some hints to the true quality of the product/service. Taking the labour market as an example, hiring a new member of staff is an investment under uncertainty for the employer, because the productivity of this employee is not 100% known to the employer before it could be identified through a period of service to the firm. Thus, this employee's prior work experience and wage schedules act as signals for quality before a job post is offered.(Spence, 1973). Another technique to help in reducing the negative impact of the information problem is by initial screening. Stiglitz (1975)

explored the possibility to screen employees' capabilities and so to distinguish productive ones from the others and offer higher wages accordingly. By doing so, employees who were considered less productive may be motivated to generate more income for the company.

Although the aforementioned three seminal papers have not specifically used the concept of information asymmetry to explain the phenomena of credit rationing, they have offered a firm foundation for later researchers to utilise their findings about information problems in the market. Credit rationing is a market failure and it occurs in a competitive market when finance providers are unwilling to lend to some borrowers due to the effect of asymmetric information (Besley, 1994), thus leaving a supply gap in the market place (Petrick, 2005).

Banks' lending decisions are based on both hard and soft information. Hard information is derived from firms' past financial statements and the credit scoring mechanism (Berry et al., 2004; Berger et al., 2005; Berger and Udell, 2007) and soft information is assessed from private information about the entrepreneur, through previous business relationships and or collected from third parties (Stein, 2002; Cole et al., 2004).

Banks hold imperfect information about their borrowers and face great difficulties in distinguishing 'honest' and 'dishonest' entrepreneurs. In fact, it is very hard for banks to estimate entrepreneurial risks and to perform any effective monitoring to protect their loan capital (Blumberg and Letterie, 2008; Brown et al., 2009). Jaffee and Russell (1976) observed that 'honest' entrepreneurs would deliberately decline a loan offer if they believed that the level of interest rate proposed was too high and so the risk of default was also too high, in other words, they would

voluntarily ration credits. On the other hand, 'dishonest' entrepreneurs are often prepared to pay a higher interest rate regardless. In addition, divergent expectations of default and different risk attitudes or perceptions of risk between lenders and borrowers, together with varied tax treatments and institutional restrictions to different firms and or industries can to a degree induce credit rationing too (Vandell, 1984).

The decision making process for lending commitment is complicated. Although entrepreneurs' credit records, past financial data and their firms' performance are essential for the assessment of credit worthiness (Fraser et al., 2001), banks can also use credit scoring techniques to test the entrepreneur's quality (Hubbard and Gregg, 2001; Berger and Udell, 2007). Information that is available to the bank is never enough to assure that the entrepreneur will honour future repayments of the loan (Rose, 1995). Information problems are even more severe when it comes to small business lending (Sapienza, 2002).

When the interest rate is low, both good and bad entrepreneurs will seek debt financing until the interest rate is raised to a certain level that eventually forces good entrepreneurs to leave the market; as a result, only bad borrowers are left and banks suffer from adverse selection (Beck, 2007). Another situation, the so-called moral hazard, may also occur when banks choose to increase interest rates. In this case, the choice of charging a higher interest rate will affect entrepreneurs' selection of investment projects. The tendency to run riskier projects to cover interest payments may ultimately lead to a reduction of profitability for the bank. Therefore, on the basis of information asymmetry and to avoid aforementioned circumstances, banks will naturally prefer to ration credit instead of raising the interest rate (Hoff and Stiglitz, 1990).

Apparently, an increase in interest rates can adversely change the behaviour of borrowers and make riskier projects relatively more attractive (Stiglitz and Weiss 1981). The problems of adverse selection and moral hazard (Stiglitz, 1989) are important considerations when forming loan contracts between the bank and the entrepreneur, thus the researcher will discuss these two concepts separately in the following two sub-sections.

#### **4.4.3.1 Adverse selection**

According to Stiglitz and Weiss (1981), an increase in interest rate can cause two effects on the expected return to the bank. The positive effect is that the expected return to the bank will increase with the rise of interest rates. Once the interest rate reaches a certain level, a further increase would trigger an effect that works in the opposite direction, and it is called the ‘adverse selection’ problem. From banks’ point of view, of course they would prefer to lend money to ‘good’ entrepreneurs, yet because they are less informed about the profitability and risks of investment projects than loan applicants, they have no choice but to increase the interest in order to compensate for potential uncertainties (Hyytinen and Väänänen, 2006).

The action to increase interest rates, depending on the return rate of investment projects, can gradually force ‘good’ entrepreneurs to leave the market when they feel the pressure from the loan obligation is too large that will induce high probability of default (Jaffee and Russell, 1976). As a result, a higher and higher proportion of loan applicants who remain in the market are ‘bad’ ones, the ones the banks would not particularly want to choose. Lending money to a ‘bad’ entrepreneur who is willing to pay a higher price, yet may or may not honour loan repayments is an

adverse selection to the bank (Beck, 2007). In this process, ‘good’ borrowers are excluded from the system, and banks are worse off. The banks’ loss of potential revenue can also be a result of entrepreneurs’ choice of investment opportunities. This issue leads us onto the next problem, namely the ‘moral hazard’ problem.

#### **4.4.3.2 Moral hazard**

Entrepreneurs’ personalities and traits, although they are not privately held information, or at least entrepreneurs would not normally intend to hide such information, are not easily observed and quantified by banks. Thus, it is almost impossible to have this crucial information converted into hard information and into the banks’ decision-making model for loan applications (Hellmann and Stiglitz, 2000). In terms of the expected return of the proposed investment project and its associated risks, entrepreneurs normally possess such information and banks may not have access to adequate information (Jaffee and Russel, 1976). It is a reasonable consideration for banks that even though the entrepreneur may have a reasonable probability of a success rate for their proposed projects, it is beyond banks’ control that the entrepreneur may mismanage and or invest in riskier projects instead once the money is received (Brealey and Myers, 1991; Besley, 1994).

Unfortunately, banks have a very limited set of techniques to stop moral wrongdoing being carried out by borrowers from time to time, and demanding a risk premium (i.e. charging higher interest rates) can result in honest entrepreneurs leaving the market with only the dishonest ones remaining (Amit et al., 1990, Jaffee and Russel, 1976). Entrepreneurs’ choices over safer versus riskier investments very much depend on how much margin a particular project can generate after deducting loan

interest commitments, hence the choice is partly induced by the level of interest rate the banks demand (Winker, 1999). A higher interest rate implies a higher loan repayment for the borrowers (Bester and Hellwig, 1987). The higher the interest rate the entrepreneur has to bear, the more likely he/she should select riskier investments in exchange for higher returns, otherwise the loan would not be affordable (Gale and Hellwig, 1985), however at the cost of a reduced probability of success (Winker, 1999).

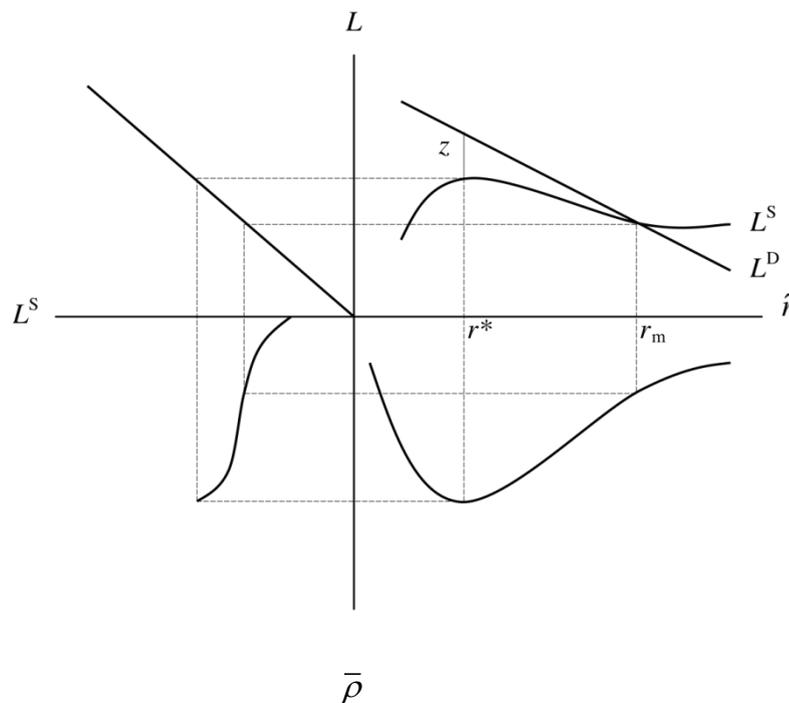
Stiglitz and Weiss (1981)'s model of credit rationing equilibrium with the existence of asymmetric information, accompanied by a graphical demonstration is presented in the next section. The researcher believes that the reader should find the persistence of credit rationing that is widespread across credit markets more understandable after seeing the construction of the model, which explains the exact reasoning behind this phenomenon.

#### **4.4.4 Credit rationing equilibrium**

In the credit market, equilibrium is said to be the market point where the optimal interest rate is reached, not where demand for credits equals the supply of funds (Stiglitz and Weiss, 1981). The optimal interest rate is achieved when the banks' highest level of expected return on loans is achieved. When the credit market reaches its equilibrium, which is when expected return on loans is at its peak, banks have no reason to lend more money even at higher interest rates as the expected return can only diminish. Therefore, if the equilibrium is reached at a point where demand exceeds supply, a supply gap will occur.

When the interest rate is low, an increase in the interest rate has an immediate positive effect on banks' returns on loans, so long as this increased revenue can outweigh the counter effects which resulted from the adverse selection and moral hazard problems. Therefore, banks' expected returns increase as the interest rate increases until it reaches a maximum (a certain level). Once the interest rate goes beyond this level, adverse selection and moral hazard effects start to take over and the expected return for banks will fall (Craig et al., 2007). Consequently, banks have the incentive to ration credit and maintain the interest rate at its optimal level and so ignore the excess demand for finance in the market. Stiglitz and Weiss (1981) have attempted to present a graphical illustration of the credit rationing phenomena. The researcher has borrowed this diagram and presented it in Figure 4.2 below.

**Figure 4.2** Determination of the bank equilibrium/optimal interest rate



Source: Stiglitz and Weiss (1981, pp.397)

Figure 4.2 demonstrates a credit rationing equilibrium position with asymmetric information. The loan demand curve ( $L^D$ ) located in the upper right quadrant is a decreasing function of  $\hat{r}$  (the interest rate charged by the bank). The supply of loans ( $L^S$ ) is also a function of  $\hat{r}$  and is plotted in the same quadrant as the demand curve. The shape of  $L^S$  is determined by the relationship between the bank's expected return ( $\bar{\rho}$ ) and the interest rate charged by the bank ( $\hat{r}$ ), which is shown in the lower right quadrant. Affected by adverse selection and moral hazard problems, an increase in  $\hat{r}$  leads an increase in  $\bar{\rho}$  up to  $r^*$  (the interest rate that maximises the expected return to the bank – the optimal interest rate). At  $r^*$ , the supply of loans is at its largest and it is also seen that the demand for credit given the rate of  $r^*$  exceeds the supply of loans. The supply gap is measured by  $z$  and signifies credit rationing.

Credit Rationing will be of type I, if all businesses, both good and bad, apply for loans; some successfully secure a loan whereas others are denied without particular reasons (Keeton, 1979). In this case, banks are possibly suffering from adverse selection problem, as good and bad borrowers are not distinguishable. Credit Rationing of a type II nature will occur if all or some businesses applying for a loan receive a lower amount than they originally asked for.

The demand and supply equals at the interest rate of  $r_m$ . However,  $r_m$  is not the equilibrium interest rate, as banks do not have incentives to raise the interest rate beyond the level of  $r^*$ , where it meets their ultimate objective – profit maximisation. As soon as the interest rate surpasses  $r^*$ , the expected return to banks ( $\bar{\rho}$ ) starts to drop (see lower right quadrant).

As discussed in an earlier section, if the bank decides to increase its interest rate in its attempt to resolve the excess demand over supply, borrowers who are more risk averse will be excluded from the credit market (Hellmann and Stiglitz, 2000), leaving only borrowers who are willing to tolerate higher risks (Freixas and Rochet, 1997). The important issue here is that, although it is good to know that there is no lack of borrowers who are more than happy to generate profits for the banks, not all of them are banks' favourites. Therefore, it is probably more effective for banks to ration credit and keep the interest rate at a lower level, so that 'good' borrowers still remain in the market, then to work on ways to identify 'good' entrepreneurs and to utilise other mechanism in order to enforce the loan commitments (Fafchamps et al., 1994).

A mix of factors will influence the probability of default on a loan, including the terms of the loan, the characteristics of the entrepreneur, the market conditions, rules and regulation changes, market imperfection, and many more (Okurut et al., 2005). Borrowers who are deemed to have a poor financial risk are usually the ones who are unable to meet the collateral requirement and / or have poor projected cash flows. Banks would almost certainly turn down their loan application and this situation is usually referred to as redlining (Parker, 2002). Collateral is apparently a vital requirement by the bank to overcome the hurdle of lack of information, and this issue will be discussed in subsection 4.6 accordingly.

Stiglitz and Weiss (1981)'s paper began the debate on credit rationing. Whether scholars have been supportive (Bester and Hellwig, 1987) or have made reservations (De Meza and Webb, 1987), this piece of seminal work provided the theoretical foundation for many empirical studies including the empirical chapters there are to follow in this thesis.

#### **4.4.5 Criticisms of the Stiglitz and Weiss (1981) model**

Ever since Stiglitz and Weiss (1981) initiated the debate on credit rationing, their model has been repeatedly challenged and criticised by other scholars. Some of these studies are selected and briefly discussed in this section to offer the reader a better picture of the debate.

De Meza and Webb (1987) challenged Stiglitz and Weiss's (1981) assumption that an increase of the interest rate will automatically induce a rise in the riskiness of a borrower's investment portfolio selection. They examined the effects of asymmetric information on the basis of investment projects in aggregation (not in isolation) and on the financial structure of the business. Their findings showed that, with information asymmetry, the distribution of investment returns played a major role in determining the financial structure of the business and the efficiency properties of the investments. De Meza and Webb (1987) argued that high interest rates can be associated with low risk investments and thus there will not be credit rationing at market equilibrium. In the same year, Williamson (1987) argued that the high monitoring costs of loans had resulted in the rationing of credit, as loan providers' aim is to maximise their returns.

Basu (1992) disagreed with Stiglitz and Weiss (1981) on the basis that any individual borrower would have an estimation of the affordability of the loan; if the loan's repayment probability is low, he/she would not consider a loan with higher interest rates. In other words, the borrower's own judgment will guide them to enter or exit the credit market and the total number of risky entrepreneurs will not change as they would not be affected by changes in the level of interest rate. However, it is to a degree confirmed that the proportion of risky entrepreneurs among the set of total

borrowers in the market will increase with the increase in interest rate, as does the likelihood of damage caused by adverse selection and moral hazard problems.

Diamond (1984) asserted that credit rationing should not be the answer for the moral hazard problem; rather, the use of a financial intermediary (i.e. the introduction of a guarantor) would be more effective. Bester (1985) demonstrated that it is possible to tell the level of riskiness of an entrepreneur by using a combination of both collateral and the interest rate and concluded that “a signaling equilibrium in the credit market necessitates a monotone relationship between the riskiness and the preference of different entrepreneurs (Bester, 1985 pp.852)”.

Banks adopt a number of measures to help in addressing the supply gap and to control the adverse selection and moral hazard problems. Relationship lending, collateral requirements, restrictive covenants, the acquisition of additional information about the entrepreneur him/herself and about the proposed project in order to assess the entrepreneur’s capacity to repay the credit facility are common practice for banks (Cole, 1998; Elsas and Krahn, 1998; Harhoff and Körting, 1998; Black et al., 1996; Ortiz-Molina and Penas, 2008). The next two sections examine the role of relationship lending in bank lending decisions.

Relationship lending is highly regarded by both the bank and the entrepreneur as one of the most effective measures to overcome unnecessary misunderstandings and this personal banking approach can be very beneficial to small and medium sized enterprises. In view of this, banks need to gather sufficient information through the entrepreneur’s social networks and lending relationships (Brown et al., 2009). Relationship lending cannot work efficiently in both parties’ interests until a sense of

trust between the lender and the borrower is built (Ferrary, 2003; Bharath et al., 2007). The next section focuses upon relationship lending.

#### **4.5 Financial Constraints and Relationship Lending**

Relationship lending implies the existence of specific information on the borrower (soft information), which is available only to the financial intermediary and the borrower him/herself (Diamond, 1984). Boot (2000, pp.10) described the bank-customer relationship as “the provision of financial services by a financial intermediary over time, enabling it to obtain specific, relevant and private information about the client, and evaluating the profitability of these types of investments”. Ongena and Smith (2000 pp.224) defined a bank-borrower relationship “to be the connection between a bank and customer that goes beyond the execution of simple, anonymous, financial transactions”. The benefits of such a relationship include the transfer of proprietary information, a commitment to work together on business projects and the provision of efficient financial services.

In a bank-entrepreneur relationship, small and medium sized businesses are often considered opaque, which means it is difficult for lenders to ascertain if firms have the capacity to pay and or the willingness to pay (De la Torre et al., 2010). As a result of information asymmetry, it is difficult for small businesses to raise adequate finance from formal financial institutions. The lack of understanding and trust between small firms and their banks may lead to credit rationing. Gatti and Honorati (2008) found that SMEs are more likely to be informal (measured as self-reported and often lacking tax compliance) and that this informality affects negatively the access to external finance.

Furthermore, generally speaking, SMEs are not normally in the position to issue debts or equity in sufficiently large amounts that would attract enough investors. Therefore, the option to raise finance directly from the capital market is normally not available to SMEs (Berger and Udell, 1998; Halling et al., 2005). As a result, they rely on banks to provide them with credit.

#### **4.5.1 The role of soft information**

For the problem of opaqueness associated with small businesses, relationship lending is seen by the conventional view as one of the effective techniques to resolve this issue. The common perception is that relationship lending can overcome opaqueness because it relies primarily on the accumulation of soft information about a small business over time, through multiple contacts with the business, its owner and the local community where the business operates (Berger and Udell, 2006).

Soft information includes assessments of a borrower's quality compiled from past interactions with suppliers, customers, competitors or other local sources. (Petersen and Rajan, 1994; Berger and Udell, 1995; Degryse and Van Cayseele, 2000). Relationship lending can potentially improve borrowers' access to credit and better the terms of loans (i.e. a lower interest rate charged by the bank). To a degree, relationship lending can even compensate for disadvantages of the borrowers, such as a shortage of collateral, lack of proven track records and or less impressive past financial statements (Bodt et al., 2005).

The effectiveness of relationship lending is largely determined by the quantity and quality of the soft information about the characteristics of the entrepreneur and

his/her business that is obtainable by the bank. Unlike hard information, soft information is more qualitative and subject to the interpretation of the gatherer (Scott, 2004). The most efficient way to gather soft information is to develop a durable relationship between banks and small firms through regular bank transactions (Elyasiani and Goldberg, 2004).

The successfulness of relationship lending depends on the characteristics of the entrepreneur and the management team, the business itself, the duration of the relationship, the scope of financial services provided to the entrepreneur in the past, and the economic conditions in which the entrepreneur operates (Boot, 2000).

As a consequence, relationship lending should improve the bank's knowledge of the characteristics of the firm, its owner and its projects, making it less risky for the bank to grant a loan (Hernández-Cánovas and Martínez-Solano, 2010). For the borrower, this should translate into an increased availability of credit and a lower cost of financing (Petersen and Rajan, 1994; Boot and Thakor, 1994).

Several researchers have thoroughly studied the importance of relationship lending in terms of the cost of financing, credit availability and collateral requirements. Small enterprises with longstanding and strong banking relationships tend to have more credit availability (Petersen and Rajan, 1994; Degryse and Van Cayseele, 2000; Hernández-Cánovas and Martínez-Solano, 2010), enjoy lower costs of financing (Burger and Udell, 1995; Blackwell and Winters, 1997), and reduced collateral requirements (Boot and Thakor, 1994; Voordeckers and Steijvers, 2006).

#### **4.5.2 The duration of a bank-borrower relationship**

The duration of the relationship between the banks and firms is an important measure of the bank-borrower relationship. As the duration of the relationship gets longer, the bank has a better opportunity to observe, understand and utilize the soft information about its customer and so can overcome the problem of information asymmetry effectively (Ongena and Smith, 2000).

Although small businesses depend mainly on banks for their external finance, previous research has shown that banks felt reluctant to lend money to small businesses (Peek and Rosengren, 1996; Keeton, 1995). If the firms have a solid, long-term relationship with the bank, the reluctance would be kept to a minimum. By studying the U.S. banks and firms, Boot and Thakor (1994) found that loan rates decrease and collateral requirements decline as a relationship matures. Burger and Udell (1995) also indicated that both the rate of credit and the probability of the lender requiring collateral to secure the loan decrease while the duration of the relationship increases. However, Cole (1998) examined the effect of duration and scope on the potential lender's decision in granting credit, and suggested that the credit availability increases only in the early part of the relationship, but does not increase thereafter. Petersen and Rajan (1994) found a positive link between relationship duration and the amount of credit offered by banks to firms.

Other evidence presented a different picture to what was anticipated. Based on the data from German SMEs, Elsas and Krahen (1998) concluded that the cost of credit was unrelated to the duration of bank-borrower relationship. Using data from Belgium, Degryse and Van Cayseele (2000) observed a positive relation between the length of the bank-borrower relationship and the interest rates charged. Arito and

Ichiro (2009) found in Japan that the riskiness of borrowers does not automatically increase the use of collateral, whereas borrowers who have a long-term relationship with their main bank are more likely to provide collateral.

### **4.5.3 Multiple bank relationships**

If the business maintains more than one bank relationship simultaneously, then this business is defined as having a multiple bank relationship. When a firm has multiple bank relationships, it can improve the terms of its financial contracts by taking advantage of the competition between banks (Ongena and Smith, 2000). The empirical findings on the outcomes of multiple relationships on credit availability, cost of financing and collateral requirement are varied. Firms which maintain multiple bank relationships need to pay higher interest rates and face more credit constraints than those with a single bank relationship (Petersen and Rajan, 1994). Cole (1998) showed that firms which have multiple bank relationships are more likely to be rejected for loan applications compared to those who have a single relationship. The availability of credit is also lower to multiple relationship firms (Harhöff and Körting, 1998).

However, Houston and James (1995) concluded that firms that have a single bank relationship have more credit constraints than those with multiple bank relationships. Ongena and Smith (2000) suggested that firms with multiple bank relationships tend to end a bank relationship sooner than single bank relationship firms, which means that a given bank relationship is less valuable to multiple bank relationship firms. However, when a firm is facing financial distress, having multiple lender relationships may cause serious coordination problems (Brunner and Krahen,

2008). From the bank's point of view, it is more likely to enter into a multiple-bank lending situation when banks have a lower level of equity (Carletti et al., 2007).

In addition to relationship lending, the use of collateral is considered an effective and more straightforward mechanism. Collateral requirements can be easily pledged into the loan contract to enhance the enforcement power for the lender. The next section will look at collateral and bank lending decisions.

#### **4.6 Collateral and Bank Lending Decision**

Generally speaking, banks would feel more inclined to relax credit rationing if borrowers put up collateral. There may be two reasons for this. Firstly, collateral acts as a safety net for banks in the event of default as banks can seize the collateral to reduce the loss on their loan capital. Second, collateral puts pressure on borrowers to avoid intentional default (thus reducing the moral hazard problem), because borrowers will lose the collateral if they default. Both reasons can reduce lending risks for banks and increase the expected return to banks and therefore banks are more prepared to relax credit rationing if collateral is agreed in the loan contract (Chen, 2006; Steijvers et al., 2010).

Collateral plays a very important role in all loan applications, especially in commercial loans. It was documented that 70% of commercial loans secured in the US (Berger and Udell, 1990) and approximately 85% of loans granted to small businesses in the UK were backed by collaterals (Black et al., 1996). Although not always true, the speed and efficiency of lending decisions can be improved with the support of collateral.

If collateral is used efficiently, the moral hazard problem can be minimised (Boot et al., 1991). Since the repayment ability of the borrower is directly proportionate to the value of the collateral he/she is willing to pledge in the loan contract (Rajan and Winton, 1995) and the borrower is made fully aware of the fact that on default of the loan, the bank has the right to repossess the collateral to pay back the loan capital (Aghion and Bolton, 1992; La Porta et al., 1998). Therefore, if it is assumed that all investors are rational, once they have agreed to put up collateral, they should have done their calculations about the cash flow projections of the projects and their repayment capability most carefully as they are in effect bearing the ultimate risk of the failure by pledging the collateral. Basically, banks ration credit when they are faced with asymmetric information, yet this rationing can be mitigated if entrepreneurs are willing to offer collateral to prove their quality (Besanko and Thakor, 1987a).

Bester (1985) believed that if banks simultaneously work on a combination of interest rates and collateral requirements when considering their credit offers, they could have the capacity to distinguish between entrepreneurs with different risk levels and it is possible that credit rationing would not occur. In practice, banks are likely to demand a higher price and more stringent collateral requirements for investments with lower cash flow projections. Through the self-selection mechanism among borrowers, borrowers who are risk averse are more inclined to accept credit contracts that entail lower interest rates and higher collateral requirements than borrowers of higher risk (Bester, 1985). This is because low risk borrowers may perceive a lower probability of losing collateral than their counterparts and hence they are willing to fulfill the collateral requirements of a more stringent nature and take advantage of a lower interest rate. On the other hand, higher risk entrepreneurs would be interested in loans

with a higher interest rate but no collateral (Capra et al., 2001). It may seem plausible for banks to resolve the adverse selection problem (Jimenez and Saurina, 2003).

It may not be totally realistic, however. There are potentially endless combinations of interest rates and collateral requirements to fit every borrower's circumstances and needs. If loan contracts can be tailor-made or there is a large enough number of different products in the credit market, no credit rationing should arise. The reasons why the aforementioned argument about the role of collateral may not be feasible in real life are: (i) writing loan contracts to suit each individual case is far too costly for banks and can be extremely confusing to all involved parties, including underwriters, loan officers, borrowers and credit control; and, (ii) an implicit assumption has to hold in order to allow the practicality of such loan arrangements, that is banks are absolutely certain of the value of the collateral and are able to seize the collateral when they need to do so (Menkhoff et al., 2006; Inderst and Muller, 2007). Depending on the institutional setting and the regulation system of the country the bank is operating within, this assumption can be violated if the credit market is rudimentary. For instance, for quite a long period of time in China that the property rights were not protected and therefore lenders were not in a position to accept some forms of assets as security for a loan and even if they did so, it would be difficult or impossible to enforce the credit contract in the event of default (Menkhoff et al., 2006). In these cases, even if the entrepreneur has put up collateral, he/she may still seek high-risk projects for higher returns, knowing that the lender is unable to seize the collateral if he/she should default (Jimenez and Saurina, 2003).

The worst scenario in a credit market concerning the use of collateral involves pseudo collateral, which is a result of regulation failures in verifying property ownership. The pledge of pseudo collateral into the market is not only detrimental to

lender-borrower relationships, but also made credit rationing remain pronounced. This phenomenon can be observed in undeveloped areas with rudimentary regulation systems, for instance in countries such as Vietnam, and China (Ninh, 2003; Yin and He, 2007).

There are many factors that are potential hindrances to the effectiveness of the use of collateral. Using Africa as an example, pervasive corruption (Biggs and Srivastava, 1996), cultural and political considerations (Platteau, 1994), legal and monitoring costs (Chan and Kanatas, 1985) and many other inconceivable difficulties are associated with the use of collateral. Cadwell and Meagher (1996) listed four key conditions to meet in order to allow an efficient use of collateral. They are: (i) protected property rights; (ii) an effective mechanism to enforce contracts; (iii) courts and registries systems to do their jobs properly; and (iv) the existence of a suitable business and lending environment.

#### **4.6.1 Collateral and the risk of lending**

The view on the relationship between collateral and the risk of lending is divided (Boot et al., 1991; Jimenez and Saurina, 2003; Inderst and Muller, 2007). In fact, scholars have found arguments for both negative and positive correlations between the two (Bester, 1985; Bester, 1994) Banks have in general always been cautious about lending to small businesses despite government policy encouragements. It may not be fair only to blame banks as they owe a duty of care to the general public and so their actions are completely reasonable. As a matter of fact, by writing loan contracts, banks are risking at a much wider extent because the loan is in theory drawn from depositors' cash. Nonetheless, to maximise profit, banks need to

constantly look for ways to identify quality borrowers and eliminate uncertainties arising from the lack of information (Inderst and Muller, 2007).

Recalling what has already been discussed, researchers have found a negative correlation between collateral and default risk (Stiglitz and Weiss, 1986). Entrepreneurs with a high-risk profile should be reluctant to pledge collateral that is proportionately high in value to the loan amount (Chan and Kanatas, 1985; Bester, 1985; Boot et al., 1991). The bank can therefore utilise this characteristic of the risky entrepreneur as a screening device to find the type of borrower they prefer (Besanko and Thakor, 1987b; Boot and Thakor, 1994). After the loan has been granted, collateral can also play a part in enforcing adherence to straight investment projects (Stiglitz and Weiss, 1986). The downside associated with this approach though is the high monitoring cost, which has negative effects upon the efficiency of the contract and eventually can also lead to credit rationing when the cost is too high (Aivazian et al., 2004). Others have asserted that even with the availability of collateral, banks may be better off rationing credit than tightening collateral requirements, as an increase in collateral requirements can result in the same way as an increase of interest rate, that is, pushing good borrowers out of the market and triggering the adverse selection problem (Stiglitz and Weiss, 1981).

In contrast, some scholars demonstrated a positive correlation between collateral and the risk of default, when riskier than average entrepreneurs borrow on a secured basis. Berger and Udell (1990) stated that on average, secured loans tend to be riskier than unsecured loans anyway. It is intuitively true that when riskier borrowers are willing to pledge more collateral, it will to a degree prevent their opportunistic behaviour, force them to concentrate on the ongoing projects and therefore increase their rate of success in doing riskier projects that can potentially

generate higher returns (De Meza and Southey, 1996). In an ideal situation, moral hazard problems can also be greatly reduced (Black and De Meza, 1992; Bester, 1994).

In summary, the existence of asymmetric information will lead to credit rationing in credit markets. The basic intuition of the Stiglitz and Weiss (1981) model is that for every moderate increase of the interest rate, banks expected return will increase, thus the supply of funds should rise, but only to a certain level, when the interest rate maximises the banks' expected return from loans. Any further increase of the interest rate will worsen the quality of the loan applicants' pool, resulting in adverse selection and moral hazard problems, thus reducing the expected return to the bank. Rationing credit instead of raising interest rates then becomes the sensible action to take for the bank. Both relationship lending and collateral can be effective tools to mitigate adverse selection and moral hazard problems depending on individual circumstances, yet uncertainties arising from asymmetric information cannot be completely eliminated.

#### **4.7 Small Business Entrepreneur and Access to Credit**

Small business financing has attracted considerable attention over the last three decades (Storey, 1994; Hughes and Storey, 1994; Berger and Udell, 2006). The availability and cost of finance matters a great deal to the performance of the entrepreneur and in many incidences access to finance determines a firm's survival (Black and Strahan, 2002). The existence of agency costs arising from asymmetric information and market imperfections has been well studied (Stiglitz and Weiss, 1981; Berger and Udell, 2006). Problems such as adverse selection and moral hazard have

threatened the bank-entrepreneur relationship and hindered the formation of trust. The persistence of credit rationing, irrespective of credit constraints small firms suffer in all stages of their businesses, made this issue quite remarkable (Binks and Ennew, 1996).

One of the main objectives of this research is to explore the demand and supply of credit in Beijing. Practically, the researcher explores variations in entrepreneur and firm-level characteristics by looking into: (i) the amount of external finance sought, (ii) the amount of external finance received, and (iii) the ratio of 'sought' to 'received' external finance.

In pursuing this broad agenda and because this study is only explorative, the researcher will place her emphasis upon the role of innovation in borrowing and lending decisions. Although the selection of innovative firms studied is on the narrow side and is not conclusive to cover all 'types' of firms, it is not difficult to imagine that innovative firms are very likely to be heavily affected by credit constraints. Therefore, this special case would be so typical that it will help the researcher to 'break the ice' which would allow future researches in the area of credit rationing in China.

Using product innovation as an example, projected cash flows cannot be estimated before a new product reaches the market and receives feedback from the end users. (Åstebro, 2003) found that 93% of inventive projects failed to reach the market and of all that did reach the market, only 40% were profitable. Hence only a tiny 2.8% of the innovative projects can achieve positive returns; this is without considering the sustainability of that particular product. If the project fails, any research and development costs incurred, which need to be financed somehow, turn to

scrap value, which is next to nothing. Therefore, it is believed that the financing of early stage innovative firms and innovative firms in general is going to be very difficult (SBS 2004/05).

Hall (1989) presented some difficulties associated with financing innovation, including the inability of finance providers to assess the technological validity and the possible outcome of the project, the higher monitoring costs due to the extreme shortage of information and the high borrowing cost to the entrepreneur due to unavoidable heavy use of short-term loans for long-term research. In addition, small innovative firms often do not have collateral can be used to secure a loan (Freel, 2000b). Innovative projects are generally considered risky, and securing finance for risky activities is becoming increasingly difficult (Love, 2003). From the above discussion, the following hypotheses can be derived:

*H6*: The innovative ventures will have a lower percentage of money received from that sought compared to the non-innovating ventures.

*H7*: The innovative ventures' amount of money sought will be higher than that sought by non-innovating ventures.

*H8*: The innovative ventures' amount of external finance obtained will be lower than the corresponding value for non-innovating ventures.

## 4.8 Empirical Evidence

The earlier sections in this chapter have concentrated on two important and related concepts in firm financing: credit constraints (taking the demand side viewpoint) and credit rationing (taking the supply side viewpoint). The researcher would like to summarise this chapter by presenting a section that is designated to review the empirical evidence on firm financing in the presence of financial market imperfections. Without intentionally taking a viewpoint from either the demand or the supply side of finance, but rather looking for empirical evidence that simply tells us what is happening in real life, would enable the researcher to see a more complete picture. Because an efficient financial market can only be achieved by combined efforts of all, and people work wonders when they are united.

The researcher will place a greater emphasis on those empirical studies that focus on developing and transitional economies, since there are similarities in terms of financial market characteristics with these of China. Unfortunately, the number of empirical studies performed with a background of developing nations is very limited. It makes every addition to this field of study worthwhile, including this thesis.

Bernanke et al. (1996) found that since lending and monitoring costs also have economies of scale, it is cheaper for the lender to lend money to larger firms. In fact, larger firms tend to apply for larger amounts of loans than their smaller counterparts and have much better access to finance. Usually it is easier for larger firms to ‘tick the boxes’ loan providers are looking for, for instance, larger firms may have better track records, have more acceptable collateral, more human capital facility to manage the investment project, better cash flow management, and so on and so forth. Overall,

these strengths may help mitigating information problems between lenders and borrowers and thus improve firms' access to finance/credit.

Levenson and Willard (2000) examined small business financing in the US in the late 1980s and concluded that constrained businesses tend to be smaller, younger and more likely to be owned by their founders than those who managed to secure external finance successfully. Nonetheless, they also found that the total number of financially constrained businesses was small; therefore the extent of credit rationing cannot be too influential over the sentiment in the market.

Harris et al. (1994) studied the financing situations of 523 Indonesian firms. They adopted ordinary least squares (OLS) and the generalised method of moments (GMM) estimators, and both techniques came up with similar results. Their key finding was that the coefficient of the cash flow variable is significant and larger for smaller firms and is insignificant and smaller for larger firms. These results suggest smaller firms suffer from financial constraints more than larger firms do.

Jaramillo et al. (1996) investigated the impact of financial market imperfections upon the investment decisions of 420 manufacturing firms in Ecuador during the period 1983 to 1988. This study found that the interest cost was an increasing function of debt to capital ratio and the constraint on these firms' leverage was binding. What is more interesting is that this model failed to hold for larger firms in the sample, which suggested that market imperfections seem to only affect the small firms' ability to obtain external finance. For instance, the effect of increasing costs of borrowing and a leverage ceiling will tend to restrict small businesses only.

To contradict the seemingly favourable conditions for large firms, because large firms often have a more diluted and diversified ownership structure, thus the

agency problem may be more severe, as a result their access to finance may also be limited on this basis (Schiantarelli, 1996; Lensink et al., 2001).

Blumberg and Letterie (2002) conducted a survey of 1223 individuals who intended to start a business during 1998 and 1999 in the Netherlands. Of these, 994 people (81.28%) eventually pursued their ambitions of becoming an entrepreneur. An analysis was carried out to study 347 respondents who had applied for credit from a bank and observed that the rejection rate was about 30%. They also produced a list of factors that had affected these start-up entrepreneurs' access to external finance, including home ownership, experience gained in previous jobs, family composition, education, nationality, role model, multiple ownership and income level in the past. They also noted that a well-written business plan and access to professional advice is helpful to improved credibility to the bank.

Hermes (1995) intended to test whether the Chilean financial reforms were successful in terms of mitigating market imperfections. During the ten year period, 1982 to 1992, data from 86 Chilean firms were gathered. He concluded that firms' investments were sensitive to internal funds, which implied the existence of financial constraints. The investment-internal funds sensitivity is greater for firms facing tighter financial constraints.

According to Berger and Udell (1998), banks have access to borrowers' repayment history and historical financial statements of the business. Therefore, the older the firm is, the longer track record the bank is able to obtain, which would be helpful for a loan application if the record is good. Older firms may have also accumulated more assets over the years that are suitable to use as collateral. Experience in dealing with lenders can also be valuable to firms. Better still, if a

personal relationship had been established with a few banks, the firm should be less constrained financially. Concerning the age of the business, Hermes (1995) found that the coefficient of the internal funds variable was significantly larger for young firms than old firms. This finding implied that younger firms were more financially constrained.

Bigsten et al. (2000) studied the manufacturing sector of six African countries in aggregation using panel data, aimed at exploring the extent of credit constraint in the manufacturing sector in Africa. They did not find sufficient evidence to suggest that firms were credit constrained. In fact, more than half of the firms in the sample did not seek credit finance. Of the other half that sought credit, only a quarter obtained loans from formal financial institutions. Discouraged borrower concept may be used to explain this situation, yet the data did not present a conclusive view on the credit constraint problem in Africa.

Another African study produced by Aryeetey et al. (1994) examined both supply and demand of financing small firms in Ghana. They found that there was no finance available to start-up firms and so firms would have to rely on internal finance. Excessive demand for loans was also observed and could not be fulfilled despite the readiness of small firms to pay higher interest rates. Again, the size of the firm appeared to be a determinant for access to finance.

Chang et al. (2010) examined a sample of 40,740 bank loans granted by one of the largest Chinese state owned banks during the period between 2003-2006. Among these loans, contracts were written between the bank and 4624 firms in total. The key finding of this study was that banks' soft information obtained through relationship lending played a significant role in loan default predictions. Soft information was

proven to be crucial in assessing the quality of borrowers, and it tended to become relatively more important than hard information in situations where longer and stronger lending relationships between the entrepreneur and the bank had been formed.

Hericourt and Poncet (2007) collected firm-level data of 2200 Chinese firms during 1999 to 2002. Their findings suggest that privately owned firms are more financially constrained than state-owned firms. Injections from foreign direct investments (FDI) can ease the difficulty of gaining access to finance for the private sector in China. FDI inflows had actually helped to fill the supply gap resulting from financial market imperfections.

#### **4.9 Conclusion**

The chapter has reviewed two important concepts in the field of access to finance, namely credit constraints and credit rationing. With particular attention paid to the impact of information asymmetry and financial market imperfections, the market equilibrium positions were investigated for both situations. The different level of information being held by two parties involved in the same transaction will result in difficulties in proceeding with this transaction efficiently. The information advantage of a borrower over the lender can result in a supply gap of finance in the market.

Akerlof's (1970) market for lemons theory, Spence's (1973) signaling model and Stiglitz's (1975) screening process laid the groundwork for the concept of credit rationing. On the basis of these three papers, Stiglitz and Weiss (1981) proposed their original credit rationing model that initiated the long lasting debate of this important

concept. They further defined problems of adverse selection and moral hazard. All above-mentioned seminal works and phenomena have been reviewed in this chapter.

In addition, the researcher explored the possibility to mitigate information problems using techniques such as relationship lending and collateral requirement mechanism. Entrepreneurs' credit accessibility was also studied in the light of the existence of market imperfections taking into consideration the characteristics of the entrepreneur and his/her firm. Three hypotheses were then proposed on the basis of the aforementioned theoretical grounds and were especially related to innovative ventures.

The chapter reviewed the empirical literature on firm financing in the presence of financial market imperfections. Special attention was paid to credit constraints and credit rationing where possible. Previous empirical studies of China are indeed very limited. The empirical evidence reviewed in this chapter covered both developed and developing economies, however more emphasis was placed on studies performed in developing nations, for their characteristic similarities to the financial market in China.

This chapter therefore serves as a solid foundation for the empirical chapters on financial constraints faced by SMEs. The next chapter presents the methodology adopted to carry out this study to deliver empirical findings that are shown in later empirical chapters.

## **Chapter 5:**

### **Research Methodology**

#### **5.1 Introduction**

The three previous chapters presented the themes to be developed and tested in the dissertation, and in particular reviewed the previous research which has been undertaken on small business finance, and the theoretical underpinnings of the dissertation - Human capital theory, and the theories of credit rationing and Credit constraints. In other words, the front half chapters of the dissertation have provided reviews of previous research that have influenced my research design and questions and hypotheses which use human capital theory as a theoretical framework to look at access to finance in Beijing. Research objectives are tempered by a need to achieve practical and do-able research. The methodology chapter presents the reasoning behind the choice of research methods adopted and the actual research itself, presented in subsequent chapters, will reveal whether or not these methods have been effective to use.

The data collection took place between July and December 2007. The questionnaire was piloted to a small number of entrepreneurs and finance experts. Modifications were then made to take into consideration the feedback received from these interviewees. Then a Survey was conducted in Beijing, China. The databases of two local Inland Revenue Offices were used as a sample framework. After skimming down the numbers of firms to be surveyed according to the selection criterion, three batches of surveys, totalling 1200 questionnaires were sent to the shortlisted

entrepreneurs. Prior to the sending of the questionnaires, the researcher liaised with officials from the Inland Revenue to, as far as possible, ensure that the person being targeted was the entrepreneur who owned the business and was the decision maker. During the six month survey, 457 responses were received, of which 5 were eliminated as useable as the numbers of employees in the business exceeded the 500 employee upper limit. To ensure the quality of the responses, telephone Q&As were carried out made available during business hours and a series of telephone prompts which not only helped to boost the response rate but also offered opportunities to clarify any ambiguities which may have existed. Due to the sensitivity of the survey questions, crucial figures were cross-checked with the database held at the local Inland Revenue Offices to verify the validity, reliability and authenticity of the respondents. This check further ensured that the questionnaires had indeed been completed by the main decision maker in the business. A healthy response rate of 37.67% was achieved. The final sample consisted of 261 manufacturing and 191 service sector firms. When the questionnaire was piloted, possible research questions were explored in the interviews. This has given the researcher insights into what matters to the stakeholders. In the following sections of this chapter, the whole research methodology of this dissertation is discussed. The reasoning behind the choice of sample, the difficulties that were encountered during data collection and hence the methods used, the data analysis techniques and also the limitations of the research model are explained.

## 5.2 The Rationale for the Choice of the Study

The importance of small and medium sized businesses (SMEs) has repeatedly been stressed both politically and economically, in academic, practitioner and political publications. SMEs have proven to play crucial roles across developed and developing countries, alike. Phrases such as ‘the engine for growth’ (Boocock and Shariff, 2005), a major driving force for economic development (Szabo, 1996), the backbone of the economy (Green, 2003; Wattanapruttipaisan, 2003), have repeatedly been used to describe SMEs’ vital position in the modern age and in particular in the period of the current crisis in the global economy. It has been argued that somehow SMEs could act as the lifeblood for the economy (Luetkenhorst, 2004) and that their blossoming in China or in developed nations such as the UK and US could push the speed of our much hoped for economic recovery.

Nonetheless, SMEs are facing more challenges than promises as they look to go forward. Although the SMEs sector is a rich data stream and brings interests to the academics to study all aspects of their businesses from operational level to policy making, the initiative to start this particular research is focused on one paramount obstacle SMEs face and that is access to finance (Sowa et al., 1992; Levy, 1993; Aryeetey et al., 1994; Chow and Fung, 2000; Hall, 2002). It is not inconceivable that in the current economic climate, with unstable political and monetary policies worldwide in the financial markets, SMEs would be even more constrained financially.

Furthermore, entrepreneurs’ human capital is considered to be a key resource for their businesses. It has been well documented that entrepreneurs’ experience impacts hugely on their businesses’ performance and access to resources (Brüderl et

al., 1992; Boxall and Steeneveld, 1999; Ucbasaran et al., 2003; Rauch et al., 2005). For instance, the choice of the source of finance used as initial capital and the access to credit later on in the business cycle can largely be explained by the entrepreneur's business ownership experience (Westhead et al., 2003). The researcher is therefore keen to find out whether there are definite links between human capital available to the owner/manager and his/her firm's financial situation, in the Chinese context or more specifically in the region of Beijing. In addition, the use of social capital (Guanxi/connections) by entrepreneurs to influence banks' lending decisions is worthy of investigation (Yeung and Tung, 1996).

To take the financing issue further and to be practical, the researcher analysed the arguably most important entrepreneurial characteristic – innovativeness of a firm and made the association with access to finance. Possible gaps are believed to exist in the financing of early stage innovative firms in general (SBS 2004/05). The idea of the research is to examine the extent of financial constraints to innovative and non-innovative SMEs with regard to different types of innovation exercised in businesses. The study is more faithful to Schumpeter's view on innovation in his earlier work (in particular his 1912 *Theory of Economic Development*) to achieve a more comprehensive understanding on the subject matter. To this end, innovations may be in: (i) products, (ii) processes, (iii) work practices or workforce organisation, (iv) supply and supplier relations, (v) markets and marketing, (vi) administration and office systems, and (vii) product distribution. These various domains of innovation are likely to signal varying degrees of technical, market and, ultimately, financial uncertainty and risk.

The lack of research in business financing in developing nations has left us plenty of gaps in both the theoretical and empirical research fields. By and large, this

is due to the fact that data collection is extremely difficult, especially in developing nations such as China. The gathering of sufficient quality data that would allow meaningful presentations of empirical results was a milestone of this dissertation. By being able to set the background of this study in the capital of empowering China, Beijing, was indeed a bonus. The next section provides the time frame to which the data gathered related.

### **5.3 Time Frame**

In order to offer a sense of continuity in the data and be able to establish trends, the study covers a period of three years (January 2004 – December 2006). This implies that the sample firms should be registered with Company House before January 2004 and have been trading within the stated time frame (2004-2006). The researcher sculpted the questionnaire such that, within a convenient time scale and with sufficient sensitivity to gain financial data from the owner-managers in Beijing, so that the data gathered would cover the longest period of time possible in order to give meaningful findings. For example, the size of the firm indicated the growth trend, and the yearly innovation expenditure as a percentage of annual turnover enabled fruitful potential for further analysis. In regards to seeking finance and the finance obtained, the owner-managers could have sought for extra finance anytime within the three year period. The number of times the entrepreneur approached an external source for finance was also recorded, as was the total amount of money which was sought, and obtained.

## 5.4 Theoretical Framework

Theory and practice are often bundled together and researchers have tried very hard to express their logical thinking by way of developing theories. Scholars have tried even harder to distinguish between theory and practice to make sure that each one of them would be upheld individually. Yet, if theory refers to “a supposition or a system of ideas intended to explain something, especially one based on general principles independent of the thing to be explained” (Oxford Advanced Learner’s Dictionary, 7<sup>th</sup> Ed.), and empirical findings are used to support or reject proposed theories, this says that theory and practice are in fact inseparable. Another definition of theory was proposed by Chinn and Kramer (1999 pp. 258) and they saw a theory as an “expression of knowledge, a creative and rigorous structuring of ideas that project a tentative, purposeful, and systematic view of phenomena.”

This study is a tentative empirical study that is aimed at explaining some real life phenomena, and therefore needs a series of interrelated concepts to guide the design, the planning and the exercise of research methodology. Considerations such as the choice of variables to be included in the survey, how they should be measured and what statistical relationships to look for in the model are mainly based on well established theories and previous researches. To be more precise, the aggregation of the concepts reviewed in this section serves as the theoretical framework of this study.

### **5.4.1 Financing and information**

The choice of exhausting internal finance (retained earnings) before seeking external finance, the so called ‘pecking order’ theory in finance is apparently applicable to small and medium sized enterprises. Empirical evidence has shown that start-up businesses mainly use internal sources of finance as their principal source of capital and then introduce external sources of finance gradually, following the pattern of the business cycle (Acs, 1985; Evans and Jovanovic, 1989; Aryeetey et al., 1994).

In advanced economies, banks are major finance providers to businesses. Funds provided are in the form of overdraft facilities, short-term loans and long-term loans. Even so, banks tend to categories SMEs in their high risk profiles and there is still some degree of credit rationing in developed countries. For instance, Oakey (2007 pp.224) suggested that in the UK “there persists a sentiment that particular niches of the demand side of this market (SMEs’ capital market) are not operating efficiently”.

In China, there is still evidence of ‘financial repression’, that is to say the institutional setting, legal requirements and policy tendencies have been restrictive to the development of financial intermediaries, particularly for SMEs (Yueh, 2008). As a result, SMEs are experiencing severe difficulties in loan applications and it was empirically shown that little or no bank financing was obtained by SMEs as late as in 2006 (Lin, 2007).

Apart from the inherent risks associated with smaller firms, such as being more prone to competition, having smaller economy of scale, through the influence of changes in laws and regulation (e.g. increase in minimum wage), information asymmetry is detrimental to SMEs credit rating (Berger and Udell, 1995; Zhao, 2008).

The problem of information asymmetry makes it rather difficult for banks to evaluate effectively the creditworthiness of the owner managers of SMEs (Berger and Udell, 1995; Binks and Ennew, 1997; Frame et al., 2001). The lack of transparency of financial information and entrepreneurs' inability to provide enough information about proposed projects to the bank made SMEs unattractive propositions to loan officers compared to their larger counterparts (Danthine and Donaldson, 2005 p.338).

With the problem of serious information asymmetry, the costs for banks to assess SMEs' loan application, monitoring their repayments and the possibility of resulting in the collection of non-performing loans (NPLs) are inevitably high. Hence higher interests rates are commonly charged to SMEs and collateral demanded (Bester, 1994; Besanko and Thakor, 1987a; Black and De Meza, 1992). In return, expensive bank credit becomes less attractive to SMEs, which again explains the 'pecking order' in terms of the preference of sources of finance.

Building a durable relationship between a bank and an entrepreneur is beneficial to the flow of information (Newton, 2000) which also brings along the issue of trust and the availability of credit (Scott and Dunkelberg, 1999; Machauer and Weber, 2000). The establishment of a good bank-entrepreneur relationship implies the transfer of proprietary information, a commitment to coordinate and the provision of adequate financial services (Boot, 2000; Gatti and Honorati 2008; De la Torre et al., 2010).

#### **5.4.2 Human capital theory (HCT) and connections in China**

There might be a 'pecking order' when entrepreneurs and owner-managers consider financing. Another major influence on the choice of an entrepreneur's start-up capital, the type and amount of finance used is the entrepreneurs' human capital (Westhead et al., 2003; Westhead et al., 2005b). In real life, how can we explain similar businesses under the same set of circumstances, experiencing totally different degrees of financial pressures? HCT is a well established theory (Becker, 1975; Westhead, 1995; Brown and Kirchoff, 1997) that brings entrepreneurs themselves, their business obstacles, their actions taken to overcome problems and their performances all together. In this study, human capital is measured by the entrepreneur's background, business ownership experience and social network ties.

Human capital is the particularly important resource one can have in China. To a large degree, it will determine whether or not you can run your business successfully. To study entrepreneurship in China, one cannot afford to omit consideration of connections (Guanxi), as this is philosophically embedded in the culture (Yeung and Tung, 1996). The existence and influence of connections is common knowledge, yet whether or not researches can show the real picture of this phenomenon, or even reveal the tip of the iceberg is questionable. Therefore, the practical way to go forward is to assume that it is there and to correlate human capital variables with the degree of financial constraints of the firm. Parts that are unexplained may be explained by social connections which are hard to quantify and it is also hard to question the entrepreneur.

Variables included in the survey related to the entrepreneurs' human capital are sex, age, education level, relative role models, family connections and

relationships with banks. This study also specifically utilised HCT to investigate innovative and non-innovative firms' financing needs and shows how well these needs have been fulfilled; or, in other words, who is more likely to be credit rationed.

### **5.4.3 Innovative vs. Non-innovative**

Drawing experiences from the UK, the study of SMEs' innovation was felt to be quite important by the researcher, simply for the reason that SMEs as an active sector of the economy are well capable to innovate and are not depressed by the fact that more resources for R&D are being held by larger companies (Pratten, 1991; Hoffman et al., 1998). Some interesting divergent messages were sent by the SBRC (1992) in light of finance as a constraint on innovation. It was reported that although Cambridge researchers found strong evidence to support the view that access to finance was a major constraint on SMEs' innovative activities (introduction of new technology in particular), yet they also found that most of those who actually sought finance did actually get it. As a matter of fact, innovation is now formally on the agenda in China, however there are only a very few empirical research studies which have looked at access to finance, and none have compared innovative and non-innovative firms in China using multivariate regression techniques.

SBS 2004/05 show evidence of possible gaps in the supply of finance for early stage technology firms, and for innovative firms in general. It is conceivable that innovative firms will tend to encounter more problems than non-innovative firms. The failure rate of inventive projects is very high. One recent study of independent investors found that 93% of inventive assignments did not reach the market and, of the 7% which did reach the market, only a mere 40% were profitable (Åstebro, 2003).

Although invention of new technology and raw materials are the most important driving force to advance productivity for the future, the researcher preferred to adopt a wider view of innovation in this study. 'Technicalist' views of innovation are narrow in terms of revealing the full impact of innovation on businesses (Freel, 2003; Howells et al., 2006). There is a tendency in the recent researches to revert back to the more comprehensive view of innovation that is proposed in Schumpeter's early works (see Schumpeter, 1912;1934;1942) as innovation has been recognised as a very complex process and therefore should not be merely explained by technology advancements (Audretsch et al., 2008; Robson et al., 2009).

Taking Schumpeter's view, owner-managers were asked to indicate in which area(s) they had performed innovative activities in the three year period, 2004-2006, and to specify whether the innovation introduced was novel or incremental. The seven domains of innovation available for them to select from were: (i) products, (ii) processes, (iii) work practices or workforce organisation, (iv) supply and supplier relations, (v) markets and marketing, (vi) administration and office systems, and (vii) product distribution. The cost of innovation as percentage of annual turnover was also gathered. Combined with indicators of financial constraints, particular emphasis was placed upon the role of innovation in borrowing and lending decisions to tie in with the financing theme of this thesis.

## **5.5 Operationalisation**

This section outlines the reasoning behind why the researcher has adopted a quantitative rather than a qualitative research methodology, why the survey was chosen as the method of data collection, why it was decided to base the geographical

location of the study on Beijing, how the sample was selected and some of the reasons why other available methods were not used. The thinking in the design stage of the research strategy for this study is revealed. The main objectives of this research are to investigate the sources of finance that are available and been utilised by entrepreneurs in Beijing, to identify and evaluate the extent of financial constraints faced by these entrepreneurs, to examine barriers to growth including non-financial factors and to make plausible recommendations for policies towards the mitigation of these obstacles/challenges that entrepreneurs have no choice but to face. Having clarified these main objectives, the research strategy used and selections made by the researcher are believed to satisfactorily accomplish the purpose.

### **5.5.1 Quantitative and qualitative research methodologies**

The gaps in both the literature on entrepreneurship in China and more so on empirical statistical/econometric studies of SMEs, together with the underlying strengths of quantitative research methodologies, has lead to the adoption of a fundamentally quantitative method of research for this thesis. In quantitative research, a much larger sample set of respondents is required compared to qualitative research. Only the gathering of a sufficient amount of data would enable the researcher to establish meaningful statistical relationships between variables and so address research questions (Aliaga and Gunderson, 2002). Quantitative research has the advantages of being objective, controlled, systematic and reliable (Punch, 2005). The data set must be collected systematically and be analysed using logically structured models to ensure the validity and reliability of the study and, by doing this the probability of creating errors is minimized (Muijs, 2004).

However, quantitative research is not without its drawbacks. Firstly, gathering a large number of respondents is expensive and, making it more difficult, the culture in Beijing is very conservative, so does not favour answering questions posed by strangers. The researcher will need to strike a good balance between the cost, the respect for people's privacy, the sensitivity of questions to be included in the survey and, eventually, the usability of the data. Secondly, skill and effort are required to ensure proper management of the sampling and collection process, so that the accuracy and validity of the data set is protected.

Moving on to qualitative research, the quality of quantitative study depends to a great extent on the "methodology skill, sensitivity, and integrity of the researcher" (Patton, 2002 pp.5). The techniques used in qualitative study (i.e. observation, interviewing, content analysis) entail discipline, knowledge, creativity and diligent work (Strauss and Corbin, 1998). Qualitative research is designed to go beyond figures and into people's opinions, viewpoints, impressions, likes and dislikes, wishes or even feelings (Myers, 2000). It is fantastic to be able to concentrate on small highly focused samples, to gain further in-depth insights or feedback on the stories that had been told by numbers (results shown by quantitative research). In addition, responses from interviewees can open up more possible explanations for the problems the researcher is looking at, and, therefore enrich the findings from the results and offer a higher degree of flexibility (Maykut and Morehouse, 1994; Padgett, 2008). If interviews are well structured, qualitative research complements quantitative research in gathering primary data that are otherwise unobtainable and making the final findings stronger (Denzin and Lincoln, 1994).

In this particular study, due to the fact that three aspects of SMEs challenges together with different types of firms were considered, the amount of work involved to arrange suitable samples and perform differently designed interviews which correspond to each of these three aspects appears to be too time consuming and unfortunately costly. Therefore, regrettably, the results of this preliminary study will be based purely on quantitative research findings. However, for papers that are due to be sent to various journals for publication, if possible, qualitative research will be added. Obviously, papers will be divided by topics to make information more condensed; thus it would then be feasible to perform qualitative research accordingly.

The above section has explained the choice of the basic research strategy of this study, which is going to be entirely based upon a quantitative research. The next section then discusses the data collection methods used to facilitate the quantitative research and why alternative methods were not used.

### **5.5.2 The creation of a questionnaire**

Because of the lack of secondary data available and more importantly to be faithful to the originality and authenticity of the study, the researcher had no choice but to come up with solutions to gather primary data sets for the empirical analysis. To perform this task, the researcher designed a questionnaire and administered these questionnaires.

Inspiration was derived from the long established SME surveys which have been undertaken by Cambridge researchers (See the Small Business Research Centre, SBRC, 1992; CBR, 1996, 1998, 2000, 2003, 2007; Bennett and Robson, 1999; Robson and Bennett, 2000) and the surveys of Entrepreneurship of Scotland (See Freel and Robson, 2004; Robson et al., 2008a) and the surveys of Entrepreneurship in

Ghana (Robson and Obeng, 2008; Robson and Freel, 2008). A survey questionnaire was prepared taking into account the specific consideration of Chinese culture. The design of the questionnaire was based on the inclusion of a usable, explanatory, and sufficient selection of variables which would allow the researcher to establish statistical relationships between these variables in an attempt to use the primary data set to test hypotheses and finally to address the research questions/objectives outlined at the beginning of this section. The survey questionnaire was prepared in English and translated into Chinese according to Chinese customs and practice and was back-translated by two academics from Beijing University. It was also piloted. The structure of the questionnaire and variables that were included will be discussed in detail in later sections in this chapter. Once the questionnaire was created, the method of distribution was on the agenda.

### **5.5.3 Considerations of how to carry out the survey**

The researcher must select a reachable representative sample and adopt the most cost-effective approach in gathering the data (McNabb, 2004). There is a menu of various methods for empirical research available to choose. In the order of distance to the respondents, there are: in-depth interviews, face-to-face questionnaire administration, telephone surveys, postal questionnaires, internet surveys and observation. The choice of using a single method, or a combination of two or more methods, is determined by for instance, the length of the questionnaire, the scale of the survey desired, the cost involved, the time constraints and the achievement of an acceptable response rate.

### **5.5.3.1 Choosing a distribution channels for the survey**

Before arriving at a decision on how the questionnaires are distributed, the questionnaire was piloted to a small number of finance experts and entrepreneurs to receive feedbacks in terms of the suitability of the questions asked, and for the best approaches to follow in order to elicit a greater number of high quality responses. The researcher approached several possible distribution channels, including the China Association of Industry and Commerce, the China Association of Small and Medium Enterprises, the China Construction Bank, the China National Investment & Guarantee Co., Ltd and the Beijing Local Taxation Bureau.

Although the China Association of Industry and Commerce and the China Association of SMEs are very reputable and are highly regarded among entrepreneurs in promoting business networks, the relationship between the associations and entrepreneurs is unfortunately not close enough to guarantee the response rate. It is even more difficult to attempt to gain access to the financial data that is crucial to this particular research through these two channels, as there is just not enough pressure from these two bodies on entrepreneurs to reveal any information of a sensitive nature.

It is probably more straightforward in terms of constructing a sample framework because of the anticipated resistance from entrepreneurs to disclose financially related information would be lower, if a bank or a guarantee company is willing to cooperate with the data collection process. It is also true that loan applications made through this particular bank (note that applications made to other banks are likely to be excluded) or guarantor would be recorded and the data could be accessible subject to any confidentiality clause. Yet, the most serious problem with this source of data is that the final sample is highly likely to be concentrated on SMEs

that are desperate for external finance. On the other hand, those who are not as deeply financially stressed, or those who did not approach the finance provider due to a lack of awareness, are omitted. Therefore, the breadth of representation and the completeness of the data set are likely to be affected.

Turning to the last of the possible sources, there are several reasons to suggest that it is the best option for this research project. The legal enforcement powers of the local taxation bureaus, and the database they hold in their systems which is mainly financial statistics (i.e. many years of balance sheets and profit and loss accounts of all registered firms who trade in its locality) are important. The familiarity of their staff with entrepreneurs operating in their territories is a desirable feature, and all things taken together the researcher felt questionnaires sent out through this channel could promise success. However, to persuade taxation bureaus to cooperate was not going to be easy. It was vital not to breach confidentiality between the authority and the businesses. Therefore, every firm surveyed was kept anonymous. It was very fortunate for the researcher that, through family connections, the tax authorities finally agreed to support the data collection.

It is worth mentioning here, , although all parties approached were willing to help and the need for this type of study struck a chord with them, they also expressed their serious reservations and concerns. The strong financial theme and inquisitorial nature of the survey made the research topic very sensitive and there is also a no 'reply culture' in China. (Gu et al., 2006; Zhuang, 2007) Therefore, even before the research had begun, the foreseeable difficulties could not have been more apparent. Resistance from the entrepreneurs was well anticipated. Finally, the database held at the local taxation bureau, allowed a valuable opportunity for cross-checking some facts and records to ensure the validity of responses.

### **5.5.3.2 Reasons for choosing a postal survey and follow up telephone prompts**

It was greatly appreciated that two local taxation bureaus (each covering its specific district in Beijing) agreed to get involved in the survey distribution. However, there were conditions attached to their cooperation and involvement. Confidentiality of the taxpayers was the top priority to be protected and, as the researcher was not employed or instructed by the authority to do the work, the nature of this research was in theory a private project. Courtesies and many facilities such as headed paper, printed envelopes, a designated office in the taxation bureau and a direct telephone line were provided, which was very generous of the tax officers. In addition, it was agreed that spare questionnaires would be placed in the reception room of the taxation bureau ready for collection and one designated member of staff in the front office was in charge of the distribution and the collection of these questionnaires.

If questionnaires are posted, the response rates are very often lower than face-to-face interviews (Walsh and Wiggins, 2003). In China, a postal survey was expensive to undertake because all the postage had to be paid for, as well as the professional printing of the questionnaires and the purchase of envelopes both for questionnaires and replies. All of these were costs which had to be paid upfront. It was a big advantage to the researcher to be able to use the facilities provided by the tax bureaus, thus making this fieldwork semi-official. The utilisation of this 'ambiguity' was the main factor that the researcher had hoped for, to guarantee the response rate.

Because of the anticipated difficulties of this field work, there was no provision for an achievable response rate, the researcher was purely and simply doing her best persuade entrepreneurs to reply. Follow up telephone calls were made three

days, one week and two weeks after the batch of questionnaires was sent out. Although time consuming, telephone chasing was not only a technique to improve the results, but in this case an absolutely necessity job to do as face-to-face contacts with the entrepreneurs would give away the fact that this survey was a private project rather than a semi-official one. Again, the ‘ambiguity’ was an advantage to the researcher and was well worth securing.

From some of the conversations in the telephone chasing after three days, it was apparent that some entrepreneurs, having decided not to reply, in fact were happy to do so after speaking to the researcher; some of these entrepreneurs who had disposed of the questionnaires agreed to come into the tax bureau to collect a replacement copy; some who were not sure of the situation, become more likely to reply after being made aware of this field work by these initial telephone chases.

The post one week telephone calls concentrated on raising the awareness of the value of replying to the survey and to convey the thanks of the authority and the researcher herself. More importantly, since the entrepreneurs had already had a chance to read the questionnaire, the researcher had an opportunity to explain survey specific questions (i.e. single or multiple choices, and questions that required respondents to rank options were particularly difficult, in terms of the amounts in number terms or in percentage terms, etc.). It was also possible to resolve any misunderstanding of the questions and to try to convince more entrepreneurs to reply. By that time, the communication between both the taxation bureau’s reception staff and the entrepreneurs and between entrepreneurs themselves were extremely helpful in stimulating the willingness to respond.

After screening the responses received, two weeks after the questionnaire were sent out, another series of telephone calls was made, to speak to non-respondents in this case and make sure those who were going to reply would do so by a deadline which had been indicated in the cover letter sent to them with the questionnaire. They had been offered a choice of posting it back to the taxation bureau or to hand it in directly at the reception. For those who seemed obviously resistant, a final but careful push was given, and it was clear that no further telephone chases should be made as the privacy of the taxpayers was to be respected and unwelcome disturbance avoided.

Learning from the first batch of 400 questionnaires, two further batches of 400 questionnaires were sent out to take the total to 1200, and telephone chases were again performed at sensible time intervals.

It was a matter of fact that if the researcher had used a postal survey method alone, the field work would have failed to deliver an acceptable response rate and the researcher would not have gathered sufficient data to perform her study. Thus, in this case, the combination of a postal survey and a series of well-planned telephone chases served the purpose very well, given the conditions the tax authority had requested the researcher to comply with. Because of the special channel the researcher was following, she was able to use a stronger survey distribution, as well as to adopt of a sensible methodological integration, so more confidence in the representativeness of and the generalisation of findings was achieved (Gilmore and Carson, 1996; O'Donnell and Cummins, 1999).

### **5.5.3.3 Reasons for not choosing alternative survey methods**

As mentioned in the above section, the confidentiality and privacy terms were agreed with the tax authority and, considering the relatively large scale of the field study, carrying out face-to-face interviews or questionnaire administration was not plausible. In fact, after more thought was given to how to fit the incredibly busy timetables and very likely different locations of 1200 entrepreneurs and make it convenient for them to be surveyed, it was apparent that this was an impossible task to perform. Despite the fact, a face-to-face survey would offer a lower sampling frame bias and response bias, so it was not practical to be adopted in this study.

A telephone survey was another possibility which could be quicker and more responsive; however, where the survey questions are lengthy (the survey is 7 pages long in this case), it was unfortunately too expensive and too time consuming to do (Kempf and Remington, 2007). Secondly, it was going to be difficult to arrange a suitable time to speak to the entrepreneurs for a long time if they were on a business trip and it was more likely that the survey request would be rejected. It was much better to ask them to fill in the survey in the freedom of their own time. Thirdly, respondents would have a higher chance of being influenced or biased by the interviewer in a telephone conversation.

### **5.5.4 Choosing a research site (area)**

Data for this study was collected from firms located in Beijing. So far, the researcher had seen very few studies performed with specific attention paid to SMEs operating in Beijing. The rare exception of a recent large-scale study of

entrepreneurship/SMEs in Beijing investigated returnee entrepreneurs on science parks (Wright et al., 2008) and the focus of their research is entirely different from this PhD study. Clearly, any research that can start filling the gap in empirical research of entrepreneurship in emerging markets, especially in China, are welcomed. There is no doubt about the importance of Beijing in terms of the economic, political and cultural roles it plays in China and even in the world today. People from all over the globe, from all backgrounds, want to know more about this ancient city's past, present and future.

For more than 700 years, Beijing has served as the capital of China and the principal seat of government. Perhaps inevitably, private enterprises in Beijing face relatively higher entry barriers as a result of competition from a great many state-owned enterprises (SOE). Moreover, intense control and monitoring by government agencies is thought to result in a discriminatory regulatory environment for SMEs (The State Council Document No.3<sup>2</sup>; China Private Enterprises Year Book 2004-2006 p. 215). This environment, in turn, may limit entrepreneurial opportunities and harden attitudes towards risk in comparison to other parts of China (China Private Enterprises Year Book 2004-2006 p. 219). The five special economic development zones<sup>3</sup>, for instance, enjoy favourable policies for taxation and benefit from a wider range of subsidies to promote economic development. An old saying may also help explain conservatism in Beijing, and not solely with regards to business activities: “*Shan Gao Huang Di Yuan*”. An approximate translation is “Mountain high, Emperor far”. In other words, the mountains are so high and the emperor so far away that we will do what we want in our local area. To this end, a comparison is often drawn between

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<sup>2</sup> Document No. 3 or “Policy Directives Regarding Encouraging the Development of Private Sector”, issued on 19 February 2005, outlines the role governments should play in encouraging, supporting and leading non state-owned businesses.

<sup>3</sup> Namely ShenZhen, Zhuhai, ShanTou, XiaMen and HaiNan.

vibrant Shanghai and subdued Beijing. The most successful Chinese entrepreneur, (Sir) Li Ka Shing, raises this issue in his 99 pieces of advice to Chinese entrepreneurs (Shang, 2005).

The release of Document No. 3 (2005) saw the removal of entry barriers for private enterprises seeking to operate in previously state or SOE-controlled sectors (e.g. finance, insurance, energy, environment protection, education, and healthcare). Document No. 3 also enhanced government support for financial services to private enterprises (China Private Enterprises Year Book 2004-2006 p. 219). These actions fostered better communication between the government and Beijing's private enterprise sector. In 2006 Beijing's GDP grew by 12%, faster than the national average of 10.7%. This may be partly explained by government spending on infrastructure, with over 100 billion Yuan spent every year since 2003 (part of the "New World, New China" project for the Olympic Games 2008 – see [www.bjinvest.gov.cn](http://www.bjinvest.gov.cn)). Beijing is also home to a number of research universities and research centres ([www.bjinvest.gov.cn](http://www.bjinvest.gov.cn)). With specific regard to the supply side of finance, every major indigenous commercial or investment bank either has their headquarters in Beijing or has an extensive branch network throughout the city-region. Further, credit guarantee companies have been working closely with the China Development Bank to assist SMEs financially and to create new financial products that are better tailored to the needs of SMEs.

The lack of data on SMEs activities in Beijing and the lack of previous research gave no guidance whatsoever to the researcher of the areas which should be concentrated on in terms of the choice of a sample. The rare example of large-scale research based in Beijing was carried out by Mike Wright and he selected his sample frame within the largest science park (ZSP) that operates on multiple sites in Beijing

(Wright et al., 2008). In his case, it was a suitable choice in the sense that returnee entrepreneurs, the topic of his study, are highly concentrated in this science park and he could have a population of 1003 identified firms to work on. Because the objective of this research is of a much broader scope, concentrating on one relatively small geographical area with a high density of similar activities would not be fit for purpose. Therefore, it was a difficult task to set out criteria of the population. The next three sections outline the steps taken to perform this task.

### **5.5.5 Choosing a sample frame**

Researchers who carry out small business surveys face serious challenges and major hindrances (Vulliamy et al., 1990). The selection of a suitable sample frame is the earliest challenge researchers tend to experience in conducting entrepreneurship research. An inclusive list of businesses with up-to-date contact information is particularly hard to find (Jay and Schaper, 2003; Westhead et al., 2005b). It is even more demanding when the sampling frame is going to be narrowed by firm size, sector, location or other determinants. Curran and Blackburn (2001) stressed the missing register for small businesses in the UK. Furthermore, having access to a list does not necessarily mean that the information content of the list is adequate for the researcher to be able to reach the participants of the survey (Jay and Schaper, 2003).

For this study, the researcher was fortunate enough to have access to the database of two local taxation bureaus in Beijing and the list of businesses they hold in their systems was the most comprehensive of its kind. The list contained all the information needed for the selection criteria, namely, the name, age, main activities, contact person, contact telephone number, legal person/owner, address, number of

years in trade, and the number of employees at the end of the financial year of all the firms that are registered for tax purposes in their territory. Consequently the population of the research was clearly defined by applying the sample criteria listed in the next section.

### **5.5.6 Sample criteria**

The participants were selected based on the following criteria:

- (i) The business must have a minimum 8 employees and a maximum 500 employees;
- (ii) The business must have been in operation for at least three years and be a going concern;
- (iii) The respondent must be the owner/founder or final decision-maker of the company;
- (iv) The business must be independently or privately owned (Rauch et al., 2005);
- (v) The business must be engaged in activities within the manufacturing or service industries<sup>4</sup> (Westhead et al., 2005b);
- (vi) The business must be located in Beijing.

### **5.5.7 Determining the size of the sample frame**

There are 18 municipal districts in Beijing, some of them have high concentrations of clusters of firms operating in very limited business sectors (i.e. computer science) and some others have too low a level of business activities that are

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<sup>4</sup> The exclusion of public services such as public transport/education/hospitals, utilities and government agencies was due to the fact that they are supported directly through government spending therefore do not fall into the purpose of the research of this paper which relates to the issue of financing SMEs'.

suitable for this study (i.e. agricultural districts). In addition, the geographical coverage of the districts is not a good indicator of the level of business activities which exist in that area in Beijing. With a good local knowledge, the researcher therefore deliberately chose two local taxation bureaus to cooperate with, because of the relatively balanced mix of businesses (i.e. sector, size) in these two districts. It was then more convenient to determine the sampling frame simply by skimming down the complete list of businesses (the study population) held by the authority according to the sample criteria. Because of the confidentiality clause the researcher had signed with the tax authority, it is unfortunately not possible to reveal the two chosen municipal districts for this study nor address more specific issues related to these two areas in details.

Once the small and medium sized enterprises sampling frame from these two districts was available, 1200 independently owned firms (the sample) were selected randomly (Simple random sampling method used here) and were ready to be surveyed. As there is no strict standard or precise number of samples required for a given type of study, the researcher had to make a reasonable estimation of the number of questionnaires needed to be sent, taking into account the following factors: the type of research involved, the hypotheses to be tested, the number of variables, how the survey is going to be carried out, the time and financial constraints (McMillan and Schumacher, 1989). The sample cannot be too small and needs to be large enough within a manageable scope to ensure the representativeness of the data and the generalisability of the findings (Fowler, 1988).

The following business sectors are covered by the sample: all of the manufacturing industries, wholesalers, real estate agencies, mining & quarrying sectors, and construction firms; as well as service sectors, but excluding any public

services such as public transport/education/hospitals, utilities and government agencies due to the fact that they are supported directly through government spending. They, therefore, do not fall within the compass of the research of this paper which relates to SMEs' financing issues.

#### **5.5.7.1 The reason for using simple random sampling**

Simple random sampling is a fair way to select a sample and it is simple to accomplish (Qi, 2001; Zhuang, 2007). Because of the fairness in the sampling process, it is reasonable to generalise the results from the sample back to the whole population. In terms of how this method is practiced in this study, the whole list of the sampling frame was recorded in Excel and then the function =RAND() was run and then the columns were sorted in the order from lowest to the highest random number. Finally the first 1200 companies in this sorted random list were identified. The drawback of this method is the omission of consideration of the subgroups/subcategories in the population. For this reason, simple random sampling is not the most statistically sophisticated method of sampling and although not used, the researcher thinks, for completeness of the methodology, it is worth mentioning the alternative method of sampling here as well – Stratified Random Sampling.

Stratified random sampling, also called proportional or quota random sampling, is particularly useful when the study needs to address key subgroups of the population, especially the key subgroups, which are small minority groups. The way stratified random sampling works is that the population is divided into homogeneous subgroups before a simple random sample is drawn from each defined subgroup. The difficulty associated with this method is that the more superior statistical precision

than simple random sampling can only be achieved if the groups/strata are indeed homogeneous. Thus the variability is reduced by stratification.

Because the population the researcher gathered from the taxation bureaus was already a well mixed dataset, there was no need to divide the dataset into subgroups as the SME sector is already a subgroup of the whole list of companies in its own right. The researcher believes that the variability in the population was also acceptable. Simple random sampling was much simpler and cost efficient to run and the sample selection fitted the purpose of the study.

Once the access problem was resolved, the sampling process for this study was not a hugely complicated matter to deal with. Moving onto the data collection stage of the field work, the structure of the survey questionnaire is outlined in the next section.

## **5.5.8 The data collection instruments**

### **5.5.8.1 Structured questionnaire**

Due to the relatively large sample required to analyse the problem of access to finance SMEs face in Beijing and the number of variables which are to be obtained from the survey would suggest a lengthy questionnaire, and the use of a structured questionnaire rather than unstructured. Indeed, from a practical point of view, structured questionnaires are much easier to analyse and much more suitable for quantitative research that require gathered datasets to be conveniently transferred into descriptive statistics and inferential statistics at a later point of time. This was tempered against the possibility of open-ended and unstructured questionnaires which

allow potentially more detailed information and explanations to be unfolded. However, with open-ended and unstructured questions there is the risk of respondents not completing such questions.

Gill and Johnson (1997) suggested three principles to follow when constructing a questionnaire; they are the focus, the wording and the structure. By adhering to these three principles, the researcher should be able to perceive that: (i) the questionnaire is comprehensive and this is to say that all the issues to be addressed and the hypotheses to be tested are actually covered in the questionnaire; (ii) the intention of the study is clear, so that all participants that are interested in the topic would be inclined to respond; (iii) the wording is clear, straightforward, reader friendly and gives a professional impression, therefore the risk of questions being misunderstood is kept to the minimum and also the quality of the responses is controlled as far as possible. The wording and the structure of the questionnaire were even more important for this particular study, as the postal survey method does not generally offer a high response rate and the survey questionnaire was designed in English first, then translated into Chinese, and finally back-translated into English. Even slight wording differences can confuse the respondent and so lead to wrong interpretations of the question ([www.socialresearchmethods.net](http://www.socialresearchmethods.net)). In other words, the terminology needs to be understandable and the questionnaire needs to be as friendly as possible and as easy to fill in as possible when it is presented to participants.

The placement of the questions was also a major part of the design process. The opening questions are generic questions to put the respondent at ease and get the ball rolling. Wherever possible, sensitive questions (i.e. on profitability, the amount of loan sought, amount of loan sought obtained, etc.) are not clustered together, as doing so could potentially put people off and reduce the response rate even further. The

researcher attempted to place difficult or uncomfortable topics after a rapport with the respondent was established and proper transition was prepared for the respondent to move onto these sensitive subjects. Important questions are intentionally placed in earlier parts of the questionnaire just in case the respondents leave the later parts blank. Some of these questions were asked twice in different formats to allow for cross-checking and to ensure consistency.

In terms of the type of questions constructed, dichotomous questions (i.e. Yes/No, True/False, Agree/Disagree questions) were widely used. Nominal questions in the forms of single choice or multiple choice questions also played a major part in the survey. Ordinal questions that asked participants to rank order their preferences were kept to a minimum as this type of question is difficult to understand by the participants and in a postal survey, the administrator does not have the opportunity to verify any ambiguities. Finally, open-end questions were avoided as they are difficult to assess and quantify and can make the already long questionnaire feel even longer.

The questionnaire was seven pages long and arranged in three sections, being 'information about your character and the business', 'innovation and performance' and 'financing'. There were 50 questions in total. The researcher had strictly followed the golden rule of survey research, that is: "Do unto your respondents as you would have them do unto you!" ([www.socialresearchmethods.net](http://www.socialresearchmethods.net)).

The next section provides information about the measures that were included in the survey which is further separately discussed with respect to the dependent variables, independent variables, control and demographic variables.

## **5.6 Measures**

### **5.6.1 Dependent variables**

Financing difficulties confronted by small business entrepreneurs in Beijing are the target observation of this study and the assessments made centred around this issue and the study delivers findings that fulfill the research objectives.

#### **5.6.1.1 Credit rationing and financial constraints**

First of all, a distinction between credit rationing and financial constraints is worth making. Empirical findings which draw the readers' attention to these two subjects will then be self-explanatory. Although these two phrases appear to be both talking about business financing problems, their meanings and viewpoints differ. For the purpose of this study, a firm is said to be credit rationed if, at the prevailing rate of interest, it seeks to access a larger amount of credit, but has to settle for less or none (Guiso, 1998). However, a credit constraint "occurs when borrower's request for a loan were completely turned down, obtained only a smaller amount or the borrower decided not to apply or requested less than they had wished to borrow because they believe they would not get that amount" (Fletschner, 2008 pp.675). Clearly, in such circumstances, loan providers are literally rationing credit on some basis other than price. 'Financial constraints' in simple terms mean frictions that hamper the firm's ability to invest, or in other words, the factors that prevent the firm from funding all desired investment projects. You could also say that the firm which is financially constrained needs extra finance. Thus it becomes apparent that credit rationing is a phenomenon and financial constraints are a set of elements.

Previous empirical studies have shown that access to finance is one of the major constraints to small business's expansion, growth and development (Steel and Webster, 1992; Levy, 1993; Pissarides, 1999; Okoh and Ping, 2000; European Commission, 2002; Van Eeden et al., 2003). In the questionnaire, respondents were asked "How much additional finance did you seek and what proportion of this did you obtain?" By examining the percentage of finance sought obtained, the degree of credit rationing was recorded. In addition, the credit rationing phenomenon was assessed by way of questioning the number of times the respondent approach various finance providers (not limited to banks only) for finance and the number of times the application was successful. Furthermore, respondents were presented with a set of possible occurrences to their credit application(s) corresponding to the same set of sources of finance as the previous table and they were asked to indicate whether they were successful by receiving full amount, reduced amount or none. Whether or not a firm was financially constrained was indicated by a Yes/No question asking if the entrepreneur had been seeking finance in the previous three years.

## **5.6.2 Independent variables**

### **5.6.2.1 Innovation measures**

In terms of our focus on innovation, and despite its having been the subject of substantial research over the years, we note a disappointing lack of consensus in defining and operationalising innovation. In analysing innovation, researchers have variously focused upon input measures (e.g. R&D expenditure or the number of qualified scientists or engineers - see Mairesse and Mohnen, 2004 as a typical example) and output measures (such patents or new product/process introductions –

see Freel and Robson, 2004). More recently, this latter focus has been broadened to include a wider set of innovation domains (such as work, supply, markets, administration, and distribution - see Guan and Ma, 2003). It may be the case that the magnitude of credit constraint is influenced by the type of innovation firms engage in (or, indeed, by the measure of innovation which researchers adopt).

Accordingly, in this study the researcher has applied multiple measures of “innovativeness” including; R&D expenditure as a proportion of turnover; and, separately, innovation introductions with respect to seven domains: product, process, work, supply, markets, administration and distribution. With regards to the seven domains of innovation adopted in this study, the participants were give a choice of three answers, being ‘no innovation’ (coded as ‘1’), ‘innovation new to firm’ (coded as ‘2’) and ‘innovation new to industry’ (coded as ‘3’), to represent ‘non-innovativeness’, ‘incremental innovation’ and ‘novel innovation’ respectively for each single domain.

### **5.6.3 Control variables and demographic variables**

#### **5.6.3.1 Education**

The Entrepreneurs’ level of education is “a key constituent of the human capital needed for business success” (Storey, 1994 pp.129). Even though some people may argue that entrepreneurs are a ‘special breed’ and education for them can often be replaced by qualification by experience (QBE). In many real life situations, the education level helps entrepreneurs to assess uncertainties better and to acquire necessary skills to develop their business. Davidsson and Honig (2003) asserted that

education can stimulate the generation of ideas and so individuals can cope better with problems. The ability to learn and to think individually is not to be underestimated.

Educational achievement has long been used as a proxy for the entrepreneur's human capital (Becker, 1975). Eight different levels of education were presented to respondents in the form of a Yes/No question and they were required to tick all the boxes that applied. The levels were middle school or less, high school, technical/vocational/apprenticeship, diploma, bachelors degree, professional qualification (i.e. in accountancy/law), masters degree or above and others. Respondents who reported 'yes' to one category were coded '1' and those who reported 'no' were coded '0'.

#### **5.6.3.2 Previous experience in business**

Another well-used proxy for the entrepreneur's human capital was his/her previous experience in business. In this survey, the number of years in business was collected as indicator to this variable (Becker, 1975). Although how much people can learn from experience is hard to quantify and varies by person, evidence shows that an individual's work experience enhances their ability to access information and finance (Boden and Nucci, 2000). Years of running a business in China would also show to some degree the number of connections the entrepreneur would build in his/her social network, as without connections, it is impossible to carry on doing business in China.

### **5.6.3.3 Family business**

Chinese families have a much tighter tie than families in Western countries. The fact that one of the family members becomes an entrepreneur means that this business soon becomes a family matter and so the family acts as the “oxygen” that feeds the fire of entrepreneurship for society (Rogoff and Heck, 2003). As a special group of business and a common form of entrepreneurship in China, family business ownership, management and performance are important issues for enterprise sustainability. The definition of a family business the researcher used was that at least one member of the family had to be employed in the business. This fact was then cross-checked by asking participants to report the percentage of the business that was owned altogether by him/her and his/her family members. Whether or not the businesses are family businesses is also in part capturing part of the social capital ties of the entrepreneurs. However, 5.6.3.12 covers Social capital in more depth.

### **5.6.3.4 Foreign direct investment involvement**

As the world has stepped into the globalization era, in the last two decades of economic reforms, China has progressively opened its door to the outside world through trade and foreign direct investment (Tseng and Zebregs, 2002). China had taken an increasingly important role as “the world factory” and became the largest foreign direct investment (FDI) recipient, surpassing the USA for the first time in 2002.

The availability of funding to the private sector is considered a vital factor to achieve economic growth and so attracting FDI, to an extent, accomplishes some of

the needs of businesses (Na and Lightfoot, 2006). Not only can FDI can bring capital, but successful cooperation with a foreign venture can also enhance technology, marketing and management skills of the Chinese counterparts which proves to be a win-win scenario (Cheng and Kwan, 2000). According to the United Nations, FDI can provide an important private financing source and is a crucial complement to national and international development efforts (UN 2002; Nunnenkamp, 2004). The respondents were required to report whether or not they receive FDI and if 'yes', what percentage of the capital was from FDI.

#### **5.6.3.5 Sector**

In the questionnaire, respondents were asked 'What does your business make/provide?' as an open-ended question. In addition, from the taxation bureau's database, main business activity/sector was also recorded; however, this was not as precise as the answers provided by the participants. The sector was not coded and was recorded faithfully according to respondents' answers.

#### **5.6.3.6 Size of the firm**

Many researchers have reported that small firms are being credit rationed and disadvantaged because of their size, and that the size of a business determines the source of finance the entrepreneur has access to, at start-up and other stages of the business cycle (Aryeetey et al., 1994; Nisanke, 2001; Hernandez-Trillo et al., 2005; Kutsuna and Honjo, 2006). The number of employees was chosen as the parameter

for the size of the business in this study. Respondents were asked to report the number of employees in their business as at the year end of 2003, 2004, 2005 and 2006.

#### **5.6.3.7 Employment growth**

By following the size of the firm, employment growth in 2004, 2005 and 2006 can be calculated by absolute (t2-t1) measures (Davidsson and Wiklund, 2000).

#### **5.6.3.8 Gender**

The gender of the final decision maker in the firm may make a difference when the firm is seeking finance. Female entrepreneurs encounter difficulties in raising external finance, particularly from banks (Birley et al., 1987; Van Uxem and Bais, 1996), which lead them to be more reliant upon personal funds. Having said that, research shows that females generally use smaller amounts of finance than males (Carter and Rosa, 1998); hence, although they tend to utilise restricted personal funds, they may not be as financially constrained as people think in reality, but this needs to be tested.

That female-owned businesses are disadvantaged over access to resources is a generally accepted observation (Carter and Rosa, 1998). Various reasons account for this phenomenon, notably the lack of collateral which can be offered by female entrepreneurs (Zeller, 1994; Baden, 1996), the fact that women tend to enter low-income service sectors (Van Uxem and Bais, 1996; Carr et al., 2000; Van Straveren, 2001), the lack of relevant experience (Cooper et al., 1994), and the lack of knowledge and information about sources of finance, products and services

(Kashuliza and Kydd, 1996; Atieno, 2001). Male respondents were coded '1' and female respondents were coded '0'.

#### **5.6.3.9 Age of the entrepreneur**

Knowledge and experience accumulate with the advancement of age and generally older entrepreneurs are more experienced in business (Aldrich, 1999). The experience referred to includes business ownership (Bates, 1990; Cooper et al., 1994), information processing, management skills, and financing skills, which all represent elements constituting the entrepreneur's human capital, which will increase with age until the person is middle-aged before diminishing over time (Cressy, 1996). This is, in fact, part of the ageing process.

Entrepreneurs were asked to indicate their exact age in the survey, as this was a straightforward easy question to answer. Having records of the exact age will give more flexibility to the researcher at a later date, if she needs to group and possibly regroup the sample taken into account of the changes in results by moving the range of the age groups.

#### **5.6.3.10 Relative role model**

Individuals with parent(s) as owners of a business are more likely to follow in their footsteps by owning their own business (Curran et al., 1991). Parent(s) acted as relative role models for the entrepreneur. Characteristics associated with entrepreneurs with a relative role model are usually demonstrated as being risk averse, possessing a fear of losing control of their business and of being protective of the

family's reputation and company's independence (Sonnenfeld and Spence, 1989; Neubauer and Lank, 1998; Romano et al., 2001). Respondents were asked to answer a dichotomous question to indicate whether they had had family members involved in business in the past.

#### **5.6.3.11 Age of business**

Generally speaking, the longer the business has been trading, at a profit, the easier it is for the firm to gain access to external finance. Start-up businesses are often more severely impeded by the presence of adverse selection and moral hazard problems resulting from information asymmetry and caused by a lack of proven track record (Huyghebaert, 2003; Huyghebaert and Gucht, 2007). This may seem to be common sense, yet evidence shows that older businesses possessing good track records tend to have more retained profit/reserves, and are therefore less likely to be financially constrained and so less likely to apply for external finance (Hall et al. 2004). Anyway, the age of the business is a determinant for SMEs' access to finance (Abor and Biekpe, 2006). The age of a business was measured by the year in which the business was established and then the response was cross-checked with the taxation bureau's records.

#### **5.6.3.12 Social capital**

It might be more appropriate to change the terminology of this section to 'social networking' or 'connections' as what was observed in the survey offered far narrower parameters than what is really captured in the context of social capital. In

making this distinction it needs to be noted the difficulties in capturing measures of social capital in quantitative research. In qualitative research the derivation and harvesting of social capital measures is easier and more comprehensive, in large part because of the interactions which the researchers have with the respondents. Obviously, with quantitative research these interactions are not present.

Coleman (1988 pp. S95) named three forms of social capital: “obligations and expectations, information channels, and social norms”. Social capital is fully exercised and extremely important in the Chinese context and is a very interesting research topic in its own right. What is worth noting is that social capital creates human capital (Coleman 1988), thus enhances the performance of entrepreneurs.

As this study is designated to address financing issues, the social capital concept was only lightly touched on, by requesting respondents to indicate whether or not they intentionally maintain good relationships with banks and if the answer is ‘yes’, with how many banks? Although the observation of social capital was restricted solely to the relationship with banks, the inclusion of these two questions enabled examination of the possible relationship between social capital and credit rationing.

## **5.7 Piloting and Screening**

The draft questionnaire was piloted to obtain feedback from a variety of sources, including academics, entrepreneurs, bankers, guarantors and policy makers. The aim of conducting the pilot study was to basically test the water and the researcher was determined to find any weaknesses in the questionnaire before they were formally sent out to the public. The pilot study helped to evaluate how

understandable the questionnaire was, to assess how uncomfortable respondents would be when asked to give answers to sensitive financial questions and to get an idea of how likely the sample would be to respond to the survey. Evaluators were asked to pay particular attention to the wording of the questionnaire and recommend changes to be made, so that the researcher would be sure that the questionnaire could be fully and easily understood by the sample entrepreneurs and the wording was friendly and professional.

Some comments were given by the evaluators regarding the length, form, content, and wording of some questions. Modifications and refinements to the questionnaire were made accordingly after careful consideration. In general, the questionnaire was well received, and the content was highly regarded. The only main concern expressed by the evaluators was that the questionnaire was too long. Although the researcher managed to shorten the 8 page long original questionnaire to the 7 page final version, it was still a lengthy survey by any standard. It was kept to that length to ensure the survey could deliver the comprehensiveness of the variables. After a successful round of piloting, the postal survey method was used for distribution and the collection process was assisted by a series of telephone chases. The next section examines these methods.

## **5.8 Getting the Respondents Back**

An appropriate survey method or a combination of methods had to be designed and administered in order to maximise the response rate, monitor the quality of the respondents and to make sure that the field work ran smoothly without interruptions. Awareness of the research among respondents was raised after the

questionnaires were sent out, but lasts only for so long, so the data collection process had to be as efficient as possible.

Since a postal survey done anonymously was the only method that was both practical to do and could protect the confidentiality of respondents' information, the researcher had to bear with the consequences of an usually low response rate generated from any postal survey. Deros et al. (2009) achieved a response rate of about 19% on their postal survey sent to 350 Malaysian manufacturing SMEs. A postal survey sent to 400 manufacturing companies in the UK by Reed et al. (2001) received the even lower response rate of 5.5%. However, to improve this statistic, telephone chases were carried out at post 3 days, post one week and post two weeks after the surveys were sent out in the mail. In addition, extra copies of the questionnaire were made available for collection at the reception desk in the local taxation bureaus and one designated member of staff from the taxation bureau was in charge of receiving the completed questionnaires.

Three batches of surveys, totalling 1200 questionnaires, were sent by post with prepaid reply envelopes or collected in person directly from their local taxation bureaus in Beijing. The advantages of using this approach included that: (i) the handing in of the responses was made as easy as possible for the participants within a locality over a reasonable period of time; (ii) opportunities to clarify doubts about specific responses were made available on 3 occasions by way of telephone conversation; (iii) costs were kept within a manageable level as the researcher could handle the majority of the work by herself and only needed selected and trained assistance when the telephone chases were carried out; and (iii) because of the involvement of the taxation authority, the researcher was able to take advantage of the ambiguity, which therefore enhanced the enforcement power of the survey.

## **5.9 Data Presentation and Analysis**

Data analysis is the fermentation process of a research study. No matter how fantastic the grapes harvested from the field, it is the fermentation and blending that makes the final wine successful. Data analysis is crucial in the sense that if it is not performed well enough, the efforts and expenses already put into the designing, planning and data collection stages of the research would be wasted. The aim is to be able to present the reader with logical and useful results that can then be transformed into policy recommendations and hopefully be beneficial to the public. The data analysis process for this study involves three major steps; data preparation, descriptive statistics and inferential statistics. They are separately addressed in the following three sections.

### **5.9.1 Data preparation**

Data preparation involves checking the accuracy of the data collected, editing the data, coding the questions and responses, entering the data into the computer and transforming the data into a database format which is then ready to be analysed.

The responses were screened for accuracy as soon as they were received. In social researches, the quality of measurement is a major issue. Questions that were asked during the data checking process were:

- (i) Is the handwriting of the respondents recognisable / readable?
- (ii) Are all important questions answered adequately?
- (iii) Are there any obvious discrepancies when the data is cross-checked against the database held by the taxation bureaus?

Reading every single completed questionnaire was time consuming, yet definitely worthwhile. It allowed the researcher to edit, correct and update any inconsistencies, irregularities and or abnormal patterns in the data immediately at the first available instance. Fortunately, due to the enforcement power of the tax authority and the interest raised within the society about the usefulness of this study, all responses were more or less completely filled out. Only minor omissions were noticed which should not affect the quality of the responses as a whole.

The data were then coded and inputted in Excel and then transferred to the Statistical Package for Social scientists (SPSS) to form the database. The reason for using SPSS was that it is one of the most widely used statistical software in social sciences and it is simple to convert an Excel database into SPSS. Many features of SPSS allow data analysis to be generated automatically and quickly, hence it serves the needs of this study very well. Periodic descriptive statistics tables were run to ensure any discrepancies and abnormalities were resolved immediately to avoid input errors.

After the data were fully inputted and transformed into the database, original returned surveys were stored safely in a data archive.

### **5.9.2 Basic descriptive statistics for the sample**

Descriptive statistics are used to highlight the basic characteristics of the database and present a summary to the reader. The survey was undertaken over the period July to December 2007, and a response rate of 37.67% was achieved. Out of

the total of 1200 questionnaires distributed, 457 responses were received after a series of telephone prompts. However, 5 of these were unusable as the number of employees in the businesses was above the 500 employee upper limit. The final sample consisted of 261 manufacturing firms and 191 service sector firms, making a total of 452 usable datasets.

In terms of the business sectors of the respondents, the manufacturing firms consisted of all of the manufacturing sectors in the 2003 standard industrial classification (SIC) between 15-36. The service sector firms consisted of the wholesale trade and repair of motor vehicles (50, 51), land transport (60), real estate activities (70), computer and related activities (72), research and development (73), and other business activities (74), where the values in parentheses are the 2003 SIC codes. Table 5.1 illustrates the relative sectoral distribution of the firms.

The descriptive statistics presented in this section relate to the full 452 firms with returned and usable information.

The key characteristics of the sample are shown in Table 5.2 were as follows: the average size of the firms was 54 employees and the average age of the firms was 8 years. Family businesses accounted for 48% of the firms and 52% were non-family businesses. The key types of businesses consisted of registered businesses (45%), partnerships (23%) and limited liability (32%). Exporters made up 25% of the firms and non-exporters, 75%. With regard to the characteristics of the owner-managers: 79% were male and 21% were female, the average age being 41 years. Of the owners, 37% had a relative as role model who had run a business before. In terms of the human capital of the owner-managers, 54% had degree level qualifications.

**Table 5.1: Relative Sectoral Distribution of Firms**

<b>Activity</b>	<b>SIC 2003</b>	<b>Number of Respondents</b>
Food Products, Beverages & Tobacco	15, 16	10
Textiles/Wearing apparel/Leather	17, 18 19	72
Wood/Paper	20, 21	4
Publishing & Printing	22	5
Chemicals/ Rubber & Plastics/ Non-metallic minerals	24, 25, 26	53
Metals/ Metal Fabrication	27, 28	45
Machinery & equipment NEC	29	27
Office machinery/ Electrical machinery/ Precision instruments/ Radio, Television and Communication Equipment/ Precision instruments	30, 31, 32, 33	14
Motor Vehicles	34	8
Furniture	36	23
Manufacturing Total		261
Wholesale Trade; Repair of Motor Vehicles	50, 51	84
Land Transport	60	7
Real Estate Activities	70	14
Computer and Related Activities	72	26
Research and Development	73	11
Other Business Activities	74	49
Services Total		191
Response Total		452

**Table 5.2: Descriptive statistics and ANOVAs.**

	Mean	S.D	n
<b>Control Variables</b>			
Sector - Manufacturing	42.26%		261
Services	57.74%		191
Size	53.57	69.80	452
Age of Business	7.68	5.92	452
<b>Entrepreneur Social Capital</b>			
Family Business	47.79%		216
Non Family Business	52.21%		236
<b>Demographic Characteristics</b>			
Sex – Male	78.98%		357
Female	21.02%		95
Age of Owner-Manager	40.98	8.24	384
Relative Role Model	36.95%		167
No Relative Role Model	63.05%		285
<b>Type of Business</b>			
Registered Business	45.13%		204
Partnership	22.79%		103
Limited liability	32.08%		145
<b>General Human Capital</b>			
Degree	53.76%		209
No Degree	46.24%		243
<b>Specific Human Capital</b>			
Exporter	24.56%		111
Non-Exporter	75.44%		341
Innovator – Product	77.67%		333
None	22.33%		119
Innovator – Process	38.05%		172
None	61.95%		280
Innovator – Work	44.91%		203
None	55.09%		249
Innovator – Supply	39.82%		180
None	60.18%		272
Innovator – Markets	59.73%		270
None	40.27%		182
Innovator – Administration	39.16%		177
None	60.84%		275
Innovator – Distribution	40.71%		184
None	59.29%		268
R&D Expenditure as a % of turnover: None	13.27%		60
1-2%	34.51%		156

**n=452**

### **5.9.3 Inferential statistics**

On the basis of proposed hypotheses and questions set out for this study, inferences from the data were made to arrive at summaries of the tested results. Appropriate statistical analyses methods were then selected for conducting analysis with the objective of gaining an overview of the data, testing the quality of data and finding results that either support or reject the null hypotheses (Hussey and Hussey, 1997; Curran and Blackburn, 2001).

The later empirical chapters of this thesis present exploratory studies of obstacles SMEs face in Beijing, and so, as such, the results are preliminary. In terms of the data analysis methods, a combination of cross-tabulations and chi-squared statistical techniques combined with OLS, tobit and other more sophisticated regression techniques were utilised. Taken together the combination of investigative techniques provides a better picture of the nature of problems small business sector experiences, associated with credit rationing, the financing of innovation and other barriers to growth in Beijing, and the issues which this rapidly developing nation faces.

### **5.10 Validity and Reliability of Survey Findings**

Reliability is the consistency of your measurement, or how well an instrument measures the same subjects the same way each time it is used under the same condition. In simple terms, it means the repeatability of your measurement. It is worth noting that reliability can only be estimated but not calculated. Validity is the strength of our conclusions, inferences or propositions. More formally, Cook and Campbell

(1979 pp.37) define it as the "best available approximation to the truth or falsity of a given inference, proposition or conclusion." Therefore, validity is to do with the fitness of instruments that were adopted in the research to arrive at the findings. It may well be argued that validity is more important than reliability for the reason that if the instrument does not accurately measure what it is supposed to measure, it is simply a wrong decision to use it even if it delivers consistent/reliable measurements.

If the findings of a research are not reliable and/or not valid, the research is a waste of time, effort and resources. How to perform the research successfully at a high standard depends on how well prepared the study design was to tackle threats/exposures to the reliability and validity of the data and the measurement instruments.

Measurement errors, which consist of two components, random error and systematic error, affect reliability and therefore should be controlled. Random error affects the variability to the data and tends to sum to 0 when the sample is sufficiently large. Hence, it is only considered as noise since it does not affect the mean value. In contrast, systematic error can be more serious, as it tends to systematically affect measurement of the variable across the sample, resulting in either a positive or negative shift of the mean value. Systematic error is therefore considered as a bias. To reduce measurement errors and strengthen the reliability and validity of the study results, the researcher took the following actions.

First of all, a structured questionnaire was derived on the basis of an extensive literature review and from numerous long established, well constructed surveys. The questionnaire was structured to ensure consistency and also intentionally included

cross-checking questions. The sample frame was then carefully selected to make sure a good level of representativeness of the data.

Secondly, the survey was pilot tested and was amended and justified against the feedbacks received from qualified respondents and experts. Thus the consistency of the measurement was improved and the testing environment was verified.

Thirdly, the fact that local taxation bureaus were used as the distribution channel for the survey research effectively encouraged the accuracy of the survey responses. Moreover, as some of the sensitive information requested in the questionnaire is already held by the tax authority, it would be pointless for the respondents to give false figures or statements in the answers. As a matter of fact, if the entrepreneur decided to send a reply back to the tax authority, he/she would be more serious about not making any mistakes in the questionnaire.

Fourthly, due to the restricted budget, the researcher carried out the majority of the fieldwork and all of the data input personally. Although it resulted in a more than the anticipated length of time, the requirement for necessary training of helpers was kept to a minimum. Helpers were only involved in the telephone prompts and passed all technical questions back to the researcher as soon as they were raised by the respondents. As a result, the quality of the surveyor was consistent and was of the highest standard which reasonably could have been achieved.

Fifthly, the sample frame was randomly selected and the final sample was large enough to eliminate random errors which may exist, thus the sample forms a good database to base the studies upon.

Last but not least, a combination of cross-tabulations and chi-squared statistical techniques and, subsequently, OLS and tobit regression techniques were employed to investigate the hypotheses. The results obtained from different techniques were used to check for consistency.

To sum up, an unreliable and invalid dataset, affected by systematic measurement errors in the system may lead to a false estimation of relationships between variables (Davidsson, 2004). The researcher paid particular attention to the instruments used in obtaining valid (accurate) and reliable (consistent) measurements and strengthened the statistical power of the study to the best of her ability.

During the period of the fieldwork, some problems and challenges were encountered. The next section outlines these difficulties.

### **5.11 Problems Encountered During the Fieldwork**

- The language problem

Because the original questionnaire was written in English, to translate into Chinese meant the precision of the terminology and wording were rather challenging. Some terminologies that are commonly used in Western countries, for instance vocational qualifications and some accounting vocabulary, were hard to translate into appropriate Chinese words, so that the meaning was correctly transferred. Unfortunately, direct translations (translation word by word) do not work in some circumstances. The questionnaire had to reflect Chinese culture and common practices and had to precisely communicate the meaning of the original questions written in English. The

questionnaire was also then back translated from Chinese to English to ensure that the questionnaire was remained.

- To reach the respondents

The most difficult task the researcher experienced during the whole time of her PhD study was to negotiate the most suitable distribution channel through which to reach the respondents. This organization had to be influential enough to help boost the response rate and had to be willing to cooperate as much as they could. Extensive family and personal networks were utilised in securing this crucial sponsor.

Numerous points of contact were approached and the feasibility of the distribution of the survey was discussed with the person with decision making authority in each organisation. In total, the researcher spent a considerable period of time and approached 5 possible distribution channels, namely the Beijing Local Taxation Bureau, the China Association of Industry and Commerce, the China Association of Small and Medium Enterprises, the China Construction Bank and the China National Investment & Guaranty Co., Ltd. Some disappointing conversations with apparently interested parties only served to make the researcher more determined to complete this project. Finally, cooperation and help were offered by two of the local taxation bureaus in Beijing, to assist her all the way to fulfill the toughest part of this research, for which the researcher remains eternally grateful.

- To secure an acceptable response rate

Despite benefiting from the backup received from the tax authority, it was still necessary to carry out telephone prompts in order to secure an acceptable response rate. For a period of 3 complete months, the researcher occupied an office in the taxation bureau and had a direct telephone line to keep in touch with the respondents and answer any questions and raised concerns. As a result, a form of trust was built up between the researcher and the respondents and, in return, more and more completed questionnaires were returned to the office. Accessibility and the personal touch were felt hugely beneficial to achieve a result of 37.67% response rate. This was an impressive result for a project run by a private individual to the majority of previous researches on China, most of which did not tackle empirical studies of this scale.

- Reluctance of respondents to share information

Financing has always been a sensitive topic to answer about, even though everyone would admit that it is one of the key issues related to all types of businesses. Understandably, the researcher encountered reluctance in the area of questions regarding their profitability, their need for finance, the amount of finance obtained and the sources of such finance (informal sources in particular). It was mostly during the post 3 days telephone prompt that some of the respondents declined to participate and did not want to be contacted further.

Percentages were asked in the questionnaire as opposed to absolute values to mitigate the fact that some respondents might give vague or false figures. Observation had shown that this technique worked quite well. There were both benefits and

dangers in deriving authority from the tax bureaus to perform the survey. Some might find it pointless or be afraid to hide information from the tax office and so just filled out the questions which were in fact nothing to do with their tax obligations, whereas others were reluctant because of the fear of revealing information which might be used against them as grounds for tax evasion charges. Some did not want to share their business' financial information in any way as they believed it was a company secret. In the end, the reluctance and hesitation from the respondents were kept at a manageable level and they were assured that the questionnaires were completed on a voluntary and anonymous basis.

- The need to interpret the questionnaire to some respondents

Although there were not too many enquiries concerning the need to interpret the questionnaire, respondents who had lower levels of education or had no contact with academic studies in the past felt some questions were difficult to understand. The fact that the researcher had deliberately called the respondents offering assistance and was available to answer any questions during working hours for three months solved this problem.

## **5.12 Conclusion**

The main focus of this study was to evaluate the credit rationing phenomena; the financial constraints firms suffer with respect to firms involved in innovation in particular and also the barriers that hinder the growth of small and medium sized enterprises in Beijing. The research methodology was chosen to fulfill the objective

of this study. The rationale for this study was to fill the gaps in empirical research into the financing and barriers to growth of Chinese SMEs to contribute to the growing knowledge in the field of entrepreneurship in China and to influence policy initiatives in small business development. A theoretical framework for the research was built on the foundation of relevant finance theories, and the human capital theory.

Cost-effectiveness and the achieving of an acceptable response rate to ensure the validity of the findings resulting from the database were the top priorities when an appropriate research strategy was proposed (McNabb, 2004). To control measurement errors, the vital instrument used for the study, the questionnaire, was created and the survey was undertaken in line with the objectives of the study. The wording of the questionnaire was clear and straightforward to answer for Chinese entrepreneurs to answer. A postal survey method combined with a series of 3 telephone prompts were believed to be the most promising approach to gather the maximum number of respondents as well as protecting the privacy of the taxpayers. A lower sample frame bias was achieved by the utilisation of a comprehensive, official and consistent list of businesses from a single source. Having a designated office and a direct telephone line inside the taxation bureau made it possible for the researcher to be reached easily by the respondents and this personal touch was very helpful in building a good relationship with respondents, controlling the quality of returned surveys and proved to be more cost effective than for instance face-to-face interviews. Although other scholars may well have favoured face-to-face interviews instead (Walsh and Wiggins, 2003; Czaja and Blair, 2005), under the circumstances the researcher faced at the time of the fieldwork, it was not practical to do interviews for such a large number of respondents.

For objective, systematic, valid and reliable findings, a quantitative research method was adopted for the three empirical chapters presented in later parts of the thesis. Qualitative research methods, although not being used for this study, were also considered to put in use as complements to empirical results derived from the sample in future publications.

The measurement of the variables for the empirical analysis were grouped into dependent, independent, control and demographic variables. The dependent variables were examined under the subjects of credit rationing and financial constraints respectively. The independent variables included growth, innovation, foreign direct investment (FDI) and family businesses. The control variables covered the business sector, size of the firm and age of the business. The demographic variables included general and specific human capital factors of the entrepreneur, namely social capital, gender, age of entrepreneur, and relative role models. The above list is however not inclusive of all the variables collected as the survey questions had a broader remit to facilitate future research papers.

In total, 452 responses were received from an initial survey of 1200 entrepreneurs. OLS, tobit and other more sophisticated regression techniques were used to analyse the data. Descriptive statistics were presented to summarise the key characteristics of the sample.

The assessment of the reliability and validity of the research findings with regards to the actions taken to reduce measurement errors and strengthen the statistical power was demonstrated in detail. At the end of the methodology chapter, the difficulties that were encountered by the researcher in completing the study were also reported.

The first five chapters of this study have looked at the originality and overview of the study, the theoretical foundations and previous research relating to finance, credit rationing and entrepreneurship with particular attention paid to China, and also the methodology adopted in gathering data for the empirical investigation. Three empirical chapters are to be presented next. The last chapter then concludes the research findings, highlights current policy debates and makes relevant recommendations to SMEs, practitioners and policy makers.

## **Chapter 6:**

### **Sources of Start-up Finance in Beijing**

#### **6.1 Introduction**

The methodology and data gathering techniques were presented in the previous chapter. Chapter 6 is the first of three empirical chapters, which collectively test a series of financial related hypotheses, derived in the front-end chapters of the dissertation. The theoretical underpinnings of the dissertation are human capital theory, which was discussed in chapter 2, and the theories of finance, which were covered in chapter 3. In this chapter differences between innovators and non-innovators are the focus of attention.

More specifically, chapter 6 explores entrepreneurs and the sources of finance in Beijing, which were utilised at the start-up stage. There is a substantial corpus of literature to suggest that access to start-up capital is vital for the formation and growth of small businesses (Hernandez-Trillo et al., 2005; Curran and Blackburn, 1993). Similarly, Schreiner and Woller (2003) are not alone in arguing that a lack of start-up capital is a major obstacle to both the development and the growth of small businesses (See Van Auken et al., 1996; Basu and Parker, 2001). There has been a substantial amount of research into start-up finance in developed nations – particularly the US, UK and mainland European countries, and to a lesser extent in some emerging nations such as Ghana and Nigeria where there is a growing body of research. However, in China there are comparatively few studies on start-up finance – especially those utilising large scale samples and quantitative methodologies (Au and Kwan, 2009; Wu et al., 2008). Moreover, within such studies the number and range of characteristics of the businesses and particularly the entrepreneurs or owner-managers is very limited. This chapter is seeking to make a contribution to addressing this gap in the knowledge base. Start-up businesses in general do not have a proven track

record, an established credit history, and often lack collateral to better facilitate the obtaining of external finance (Huyghebaert and Van de Gucht, 2007). These contextual characteristics of start-up businesses can then result in the scenario of information asymmetries – adverse selection and also moral hazard, and this in turn may influence and have a bearing upon which sources of finance are utilised at the start-up stage (Shane and Cable, 2002). Previous research by Westhead et al. (2003) and Westhead et al. (2005b) have shown that, in the UK, characteristics of the entrepreneurs – particularly the human capital of entrepreneurial experience - is an important factor in the choice of entrepreneur’s start-up capital, as well as the amount which is derived from each source of capital at the start-up stage. However, comparatively little research has looked at the relationship between a specific form of human capital – innovation and start-up finance in China.

This chapter has the objective of exploring the entrepreneur’s access to start-up capital, and the influence of innovation in accessing start-up capital in Beijing. The theoretical construct utilised is human capital theory which has then been applied to cross-tabulation analysis and then multivariate logistic regression analysis. The reader is reminded that the following hypotheses are tested in the chapter.

*H1:* Entrepreneurs engaged in innovation are more likely to report a higher usage of their own savings as a source of finance at start-up compared with entrepreneurs not engaged in innovation.

*H2:* Entrepreneurs engaged in innovation are more likely to report higher usage of external sources of finance at start-up compared with entrepreneurs not engaged in innovation.

The chapter is structured as follows: Section two looks at the use of sources of finance at start-up. This is followed by section three which looks at cross-tabulation analysis of innovation and the control characteristics of the business and the entrepreneurs against the use of start-up finance. Section four focuses upon the same methodological approach as that pursued in section three but now focused upon the mean percentage of start-up finance by source. Section five takes the analysis further by utilising multivariate regression analysis to pursue data regression analysis. This section includes a discussion of the findings and the implications. In section six, a conclusion completes the chapter.

## 6.2 The Use of Sources of Finance at Start-up

This section provides an overview of the overall general results on: (1) the use of start up finance, by source, and (2) the mean percentage amount of finance which came from each source at start up. Each of the sources of finance is examined in turn before the cross-tabulation analysis compares the aforementioned with whether or not the firms were innovators and the other characteristics of the entrepreneurs and their businesses.

### 6.2.1 Descriptive statistics results

**Table 6.1: The use of each source at start-up, and the mean percentage amount of finance obtained by source.**

<u>Source</u>	<b>Use of each source at start-up</b>	<b>Mean percentage amount of finance by source</b>
Own funds	87.83	60.50
Partners	29.42	12.76
Ordinary Shares	30.09	17.70
Bank loans and overdrafts	3.10	0.60
Trade credit	1.11	1.14
Family contributions	14.60	6.08
Other sources	2.43	1.22

#### *Own Funds*

The results from Table 6.1 show that the most used source of start-up finance was their own savings and this was cited by 87.8% of the entrepreneurs. Moreover, Table 6.1 also serves to show that the mean use of own savings was 60.5% of start-up finance. In other words, on average more than one half of the start-up finance came

from own savings, proving it to be the most important source of start-up finance. The research result is consistent with previous research on China, although in this study there is a discrepancy with the results of studies on China, and also developing nations in Africa. In part this can be rationalised because the categories here differentiated between own savings and partners' funds.

Hussain et al. (2006) found that at start-up stage 22.2% of start-up finance came from own savings. In contrast, Lin (2002) in the first of his surveys conducted in 1998 found that the majority of the capital employed (in excess of 50% of the total assets) came from self-accumulation. However, in his second survey which was also conducted in 1998, he found that 67% of the surveyed SMEs raised their fixed asset investments by themselves and 81% had more than 50 per cent self-raised fixed assets investment; and, only 3% had their initial fixed-asset investment borrowed from financial institutions. A more comprehensive survey of private enterprises was undertaken by the China Industrial and Commercial Union (CICU) and Research Commission of Chinese Private Business (RCCPB) which conducted five nationwide samplings for 1993, 1995, 1997, 2000 and 2002. They found that private enterprises had 65.5% of their start-up capital was self-accumulation (Hussain et al, 2006). The most recent of the samplings, in 2002, which overall covered a decade showed that self-accumulation had diminished but still accounted for the majority of private sector start-up finance (Hussain et al., 2006).

Empirical studies have also shown that private enterprises in Wenzhou (a major city in the Yangtze River Delta) were mainly self-funded or relied on private borrowings during start-up (Zhang and Li, 1990; Chen, 2002). A more recently published work by Chen et al. (2006) but covering a slightly earlier period from 2000 found that the most important source of start-up finance was founding members

providing 74.5%. Given that this included the entrepreneur as well as partners' funds, it is in line with the findings of this new research.

Aryeetey et al. (1994) found that 67% of small businesses in Ghana mentioned own savings as the main source of start-up capital. It must be noted that within African studies the importance of start-up finance does vary. For example, looking at Kenya, Gray et al. (1997) found that most of the small firms indicated that their own savings were their main source of start-up capital, and they also found that no business had gained start-up capital from a formal source.

The findings on the owners' savings in Beijing are generally consistent with previous research which has been conducted in developed nations. For example, in the US, 47% of small businesses relied upon savings for their principal source of start-up finance, and in the UK it was slightly lower at 43% (Dunkelberg and Cooper, 1983). However, as with the previous research on African nations the magnitude of the importance of own savings for start-up finance does vary. For example, in Ireland a study by Bhaird and Lucey (2006) found that savings was the principle source of start-up finance for 51% of firms. In Japan the corresponding figure of 80% has been found by Kutsuna and Honjo (2006).

### *Partners*

Partners were the third most used source of start-up finance and were used by 29.4% of entrepreneurs, slightly less than one in three entrepreneurs. The mean amount of start-up finance from partners was 12.76%, approximately one eighth of the start-up finance. The partners are shareholders who may or may not be involved with the day-to-day management of the business. The advantage of partners investing in the firms is that their contributions to the financing are usually very similar to those of a single entrepreneur – typically over a long term duration and of an interest free

nature. Moreover, the partners may also provide the entrepreneur with advice and expertise which can be leveraged throughout the life of the business, but especially at start-up. By way of comparison a study by Aryeetey et al. (1994) from Ghana found that 7.8% of the businesses used co-investors' finance at the start-up stage, whilst a study from Japan by Kutsuna and Honjo (2006) established that 37% of the sampled businesses used co-investors.

### *Ordinary Shares*

Ordinary shares were issued by 30.1% of businesses as a source of start-up finance and, on average, accounted for 17.7% of start-up capital. Thus, overall ordinary shares and partners' funds at start-up are similar in terms of magnitude with the use of ordinary shares narrowly behind partners' funds as the third most used source of start-up capital. However, when the analysis centres upon the percentage of start-up finance from sources the ordinary shares were the second most important source with an average of 17.7%. In other words, ordinary shares accounted for slightly less than one fifth of start-up finance.

The blossoming of the private sector and the emergence of limited liability businesses and also the development of the capital markets represent new developments in China. Previous researchers have generally not investigated the capital of limited liability businesses as they tended to cover the period of the 1990s and the early 2000s. Subsequently limited liability businesses have massively increased in number, but clearly as a source of start-up finance ordinary shares are a much lower contribution than the use of owners' savings.

### *Family contributions*

At the start-up stage, 14.60% of businesses used family contributions as a source of finance. On average this amounted to 6.08% of the finance at start-up.

Hussain et al's (2006) research was undertaken from December 2005 to February 2006 in the Eastern region of China and found that 70.1% of start-up finance came from the owner's immediate family. The large difference from this study could perhaps be explained by their comparatively low sample of 32 firms whilst this researchers' study is of 452 firms, more than fifteen times the size of the study by Hussain et al. (2006).

For developed nations, Basu and Parker (2001) have indicated that besides bank loans as a source of start-up capital, loans from family members and friends are the principle sources of start-up capital. Curran and Blackburn (1993) found that amongst ethnic-owned businesses in the UK, family loans constituted approximately 15% of start-up capital.

However, the study by Aryeetey et al. (1994) found that 11% and 5% of businesses reported that their main source of start-up capital was gifts and loans from friends and relatives, respectively. Adams (1992) has argued that gifts and loans from friends and relatives has been used as sources to help overcome the weak institutional and enforcement problems and are therefore ratcheted up because of social pressure and reciprocity.

#### *Bank loans and Overdrafts*

Bank loans and overdrafts are not used very often in Beijing for start-up businesses. Indeed, only 3.10% of businesses used these facilities. On average, bank loans and overdrafts accounted for 0.6% of start-up finance. Several reasons can be put forward to explain their low use in Beijing. Firstly, there is the issue of information asymmetry – the adverse selection and moral hazard problems which are generally more likely to be severe or acute with regard to start-up businesses (Huyghebaert and Van de Gucht, 2007). Secondly, the entrepreneurs typically lack a

proven and demonstrated track record and evidence of business experience (Nissanke, 2001; Berger and Udell, 1998). Thirdly, in China the new businesses typically lack a relationship with the banks which, together with the earlier information asymmetries, hinders their likelihood of securing bank loans or overdrafts.

Hussain et al. (2006) found that financial institutions provided 7.7% of start-up finance in China. The research undertaken by the China Industrial and Commercial Union (CICU) and Research Commission of Chinese Private Business (RCCPB) found that in 1993 21% of start-up finance came from bank loans and rural credit cooperatives (Hussain et al., 2006).

By way of comparison, in both developed and developing nations the use of bank loans and overdrafts varies, but is typically comparatively lower in developing nations. In Mexico the use of bank loans and overdrafts was found to be 0.6% by Hernandez-Trillo et al. (2005) and 5% by Heino (2006). A higher use of bank loans and overdrafts at start-up has been found in developing nations; Acs (1985) found that 28% of American businesses used these sources, Hamilton and Fox (1998) found that 11% of New Zealand businesses used bank loans and overdrafts, and Kutsuna and Honjo (2006) found that the corresponding level of use was 12.5% of businesses.

#### *Trade credit*

Trade credit was used by 1.11% of the businesses and on average trade credit represented 1.14% of start-up finance. The earlier research on China has found that trade credit was only a minor contributor. Chen (2006) included trade credit in his 'other' category of start-up finance, and it accounted for only 2.1% of the total. Hussain et al. (2006) only reported initial funds from owners' savings, owner's immediate family and financial institutions. In other words, trade credit did not feature in Hussain et al.'s (2006) findings.

### **6.3 Crosstabulation Analysis – the Use of Start-up Finance**

Table 6.2 and 6.3 show cross-tabulation analysis of the use of start-up finance against innovation and the control variables which relate to the entrepreneurs and the businesses. Each of the sources of finance is examined in turn and the two hypotheses are tested using bivariate analysis. Subsequently, the hypotheses are also tested using multivariate analysis.

#### *Own Savings*

At start-up, 89.4% of product innovators and 82.4% of non-product innovators used the entrepreneurs' own savings as did 92.4% of distribution innovators and 84.7% of non-distribution innovators. With the other types of innovation there were no statistically significant differences between innovators and non-innovators and the use of own savings at start-up. Thus, with regard to the use of own savings there is mixed evidence in support of hypothesis H1.

Two of the control variables were found to be statistically significantly related to the use of own funds at start-up at the 0.05 level or better, and these were whether or not it was a family business, and the type of business. Own savings were used by 93.1% of family and 83.1% of non-family businesses at start-up. While 76.6% of limited liability businesses used own savings. This was much lower than the 93.1% found for registered businesses and the 93.2% for partnerships.

**Table 6.2: Descriptive statistics – the use of own funds, partners, and ordinary shares at start-up**

	Own Funds	Chi-Square	Partners	Chi-Square	Ordinary Shares	Chi-Square	n
<b>All</b>	87.8		29.4		30.1		452
Manufacturing	88.5	0.262	29.5	0.002	<b>27.6</b>	<b>6.061<sup>b</sup></b>	261
Services	86.9		29.3		<b>33.5</b>		191
8-19 employees	87.8	2.839	26.1	2.038	31.1	2.185	180
20-49 employees	90.6		32.0		28.1		128
50-99 employees	83.3		32.1		34.6		78
100-199 employees	90.0		27.5		22.5		40
200-499 employees	84.6		34.6		30.8		26
1-5 years old	86.5	1.088	27.5	0.741	34.3	2.623	178
6-9 years old	89.8		31.6		28.2		177
≥10 years old	86.6		28.9		25.8		97
Family Business	<b>93.1</b>	<b>10.562<sup>a</sup></b>	<b>21.8</b>	<b>11.706<sup>a</sup></b>	<b>24.5</b>	<b>6.061<sup>b</sup></b>	216
Non Family Business	<b>83.1</b>		<b>36.4</b>		<b>35.2</b>		236
Male	88.8	1.476	30.5	1.003	29.7	0.127	357
Female	84.2		25.3		31.6		95
18-30 years old	<b>87.2</b>	<b>8.102<sup>b</sup></b>	31.9	1.862	<b>42.6</b>	<b>8.111<sup>b</sup></b>	47
31-45 years old	<b>88.8</b>		28.1		<b>29.5</b>		285
46-55 years old	<b>87.2</b>		34.0		<b>25.5</b>		94
≥56 years old	<b>80.8</b>		23.1		<b>30.8</b>		26
Relative Role Model	91.0	2.516	26.3	1.208	<b>24.6</b>	<b>3.861<sup>b</sup></b>	167
No Relative Role Model	86.0		31.2		<b>33.3</b>		285
Registered Business	<b>93.1</b>	<b>25.417<sup>a</sup></b>	<b>20.1</b>	<b>40.882<sup>a</sup></b>	<b>24.0</b>	<b>16.294<sup>a</sup></b>	204
Partnership	<b>93.2</b>		<b>54.4</b>		<b>24.3</b>		103
Limited liability	<b>76.6</b>		<b>24.8</b>		<b>42.8</b>		145
Degree	87.1	0.205	32.1	1.297	33.0	1.399	209
No Degree	88.5		27.2		27.6		243
Exporter	90.1	0.702	<b>36.9</b>	<b>3.998<sup>b</sup></b>	<b>25.2</b>	<b>3.999<sup>b</sup></b>	111
Non-Exporter	87.1		<b>27.0</b>		<b>31.7</b>		341
Innovator – Product	<b>89.8</b>	<b>4.537<sup>b</sup></b>	29.4	0.003	30.0	0.002	333
None	<b>82.4</b>		29.4		30.3		119
Innovator – Process	89.0	0.327	27.9	0.308	<b>34.9</b>	<b>4.007<sup>b</sup></b>	172
None	87.1		30.4		<b>27.1</b>		260
Innovator – Work	88.7	0.242	<b>31.5</b>	<b>4.005<sup>b</sup></b>	32.5	1.029	203
None	87.1		<b>27.7</b>		28.1		249
Innovator – Supply	90.0	1.316	30.0	0.048	32.8	1.028	180
None	86.4		29.0		28.3		272
Innovator – Markets	89.0	0.396	<b>31.9</b>	<b>3.999<sup>b</sup></b>	31.5	0.619	270
None	87.0		<b>25.8</b>		28.0		182
Innovator – Administration	90.4	1.789	<b>36.2</b>	<b>6.352<sup>b</sup></b>	28.8	0.225	177
None	86.2		<b>25.1</b>		30.9		275
Innovator – Distribution	<b>92.4</b>	<b>6.036<sup>b</sup></b>	29.3	0.001	<b>32.1</b>	<b>4.124<sup>b</sup></b>	184
None	<b>84.7</b>		29.5		<b>28.7</b>		268
R&D Expenditure as a % of turnover: None	<b>83.3</b>	<b>13.588<sup>b</sup></b>	<b>30.0</b>	<b>25.665<sup>a</sup></b>	<b>25.0</b>	<b>12.502<sup>b</sup></b>	60
1-2%	<b>92.3</b>		<b>29.5</b>		<b>30.8</b>		156
3-5%	<b>88.1</b>		<b>34.7</b>		<b>21.2</b>		118
6-10%	<b>76.8</b>		<b>23.2</b>		<b>42.0</b>		69
11-20%	<b>93.8</b>		<b>31.3</b>		<b>34.4</b>		32
≥21%	<b>94.1</b>		<b>11.8</b>		<b>47.1</b>		17

### *Partners funds*

Three types of innovation generated statistically significant differences against the use of partners' funds at start-up. Partner's funds were used at start-up by 31.5% of work innovators and 27.7% of non-work innovators, by 31.9% of market innovators and 25.8% of non-market innovators and by 36.2% of administration innovators and 25.1% of non-administration innovators. However, for product, process, supply and distribution there were no statistically significant differences against the use of partners' finance at start-up. Thus, there are mixed results with regard to hypothesis H2.

At start-up, 21.8% of family businesses and 36.4% of non-family businesses used partners' funds and this was statistically significant at the 0.01 level. Type of business was also highly statistically significantly at the 0.01 level related to the use of partners' funds at start-up. Partner's funds were used by 54.4% of partnerships at start-up which was more than double the 20.1% of registered businesses and 24.8% of limited liability businesses who used partners' funds at start-up.

### *Ordinary shares*

Table 2 shows that process innovators and also distribution innovators were more likely than their non-innovating counterparts to use ordinary shares at start-up. Process innovators (34.9%) and non-process innovators (27.1%) used ordinary shares at start-up as did 32.1% of distribution innovators and 28.7% of non-distribution innovators. The other innovation variables are not statistically significantly related to the use of start-up finance. Thus, there is mixed evidence with regard to the hypothesis H2.

Ordinary shares were used by 27.6% of manufacturing and 33.5% of service sector businesses at start-up. In addition, 24.5% of family and 35.2% of non-family

businesses used ordinary shares at start-up. A total of 42.8% of limited liability businesses used ordinary shares at start-up which is substantially more than the 24.0% of registered businesses and 24.3% of partnerships.

### *Bank loans and Overdrafts*

All the innovation variables are statistically significant at the 0.05 level or better. Just 3.9% of product and 0.8% of non-product innovators used bank loans and overdrafts, while 6.4% of process innovators and 1.1% of non-process innovators used bank loans and overdrafts. A similar pattern emerges for work innovation where 6.4% of work innovators and 0.4% of non-innovators used these sources. At start up, 5.0% of supply innovators and 1.8% of non-supply innovators used bank loans and overdrafts as did 4.8% of market innovators and 0.5% of non-market innovators and 6.2% of administration innovators and 1.1% of non-administration innovators, and In addition, 4.9% of distribution and 1.9% of non-distribution innovators used bank loans and overdrafts at start-up. Thus, the evidence for the use of bank loans and overdrafts is strongly in support of hypothesis H2.

Furthermore, 1.2% of entrepreneurs with relative role models and 4.2% of entrepreneurs without relative role models used bank loans and overdrafts at start-up and this was statistically significant at the 0.05 level. Also using bank loans and overdrafts were 4.3% of entrepreneurs with degrees and 2.1% of those without degrees.

**Table 6.3: Descriptive statistics – the use of bank loans and overdrafts, and family contributions at start-up**

	Bank Loans & Overdrafts	Chi-Square	Family contributions	Chi-Square	n
<b>All</b>	3.10		14.6		452
Manufacturing	2.3	1.312	<b>16.9</b>	<b>4.877<sup>b</sup></b>	261
Services	4.2		<b>11.5</b>		191
8-19 employees	1.7	5.714	<b>12.8</b>	<b>21.011a</b>	180
20-49 employees	3.1		<b>17.2</b>		128
50-99 employees	2.6		<b>10.3</b>		78
100-199 employees	7.5		15.0		40
200-499 employees	7.7		26.9		26
1-5 years old	2.2	0.998	12.9	0.742	178
6-9 years old	3.4		15.3		177
≥10 years old	4.1		16.5		97
Family Business	2.8	0.141	<b>24.1</b>	<b>29.767<sup>a</sup></b>	216
Non Family Business	3.4		<b>5.9</b>		236
Male	3.1	0.001	15.1	0.374	357
Female	3.2		12.6		95
18-30 years old	6.4	2.114	12.8	1.289	47
31-45 years old	2.8		15.4		285
46-55 years old	2.1		14.9		94
≥56 years old	3.8		7.7		26
Relative Role Model	<b>1.2</b>	<b>4.656<sup>b</sup></b>	<b>29.3</b>	<b>46.145<sup>a</sup></b>	167
No Relative Role Model	<b>4.2</b>		<b>6.0</b>		285
Registered Business	2.5	0.556	<b>19.6</b>	<b>7.557<sup>b</sup></b>	204
Partnership	3.9		<b>9.7</b>		103
Limited liability	3.4		<b>11.0</b>		145
Degree	<b>4.3</b>	<b>3.999<sup>b</sup></b>	<b>9.6</b>	<b>7.895<sup>a</sup></b>	209
No Degree	<b>2.1</b>		<b>18.9</b>		243
Exporter	2.7	0.076	<b>18.9</b>	<b>4.889<sup>b</sup></b>	111
Non-Exporter	3.1		<b>13.2</b>		341
Innovator – Product	<b>3.9</b>	<b>4.766b</b>	15.3	0.516	333
None	<b>0.8</b>		12.6		119
Innovator – Process	<b>6.4</b>	<b>10.062<sup>a</sup></b>	14.0	0.094	172
None	<b>1.1</b>		15.0		260
Innovator – Work	<b>6.4</b>	<b>13.424<sup>a</sup></b>	12.8	0.951	203
None	<b>0.4</b>		16.1		249
Innovator – Supply	<b>5.0</b>	<b>5.099<sup>b</sup></b>	<b>11.7</b>	<b>4.889<sup>b</sup></b>	180
None	<b>1.8</b>		<b>16.5</b>		272
Innovator – Markets	<b>4.8</b>	<b>6.609<sup>a</sup></b>	14.4	0.013	270
None	<b>0.5</b>		14.8		182
Innovator – Administration	<b>6.2</b>	<b>9.419<sup>a</sup></b>	<b>11.9</b>	<b>4.003<sup>b</sup></b>	177
None	<b>1.1</b>		<b>16.4</b>		275
Innovator – Distribution	<b>4.9</b>	<b>4.099<sup>b</sup></b>	14.7	0.001	184
None	<b>1.9</b>		14.6		268
R&D Expenditure as a % of turnover: None	<b>0</b>	<b>15.220<sup>a</sup></b>	<b>16.7</b>	<b>18.650<sup>a</sup></b>	60
1-2%	<b>0.6</b>		<b>11.5</b>		156
3-5%	<b>3.4</b>		<b>16.9</b>		118
6-10%	<b>5.8</b>		<b>8.7</b>		69
11-20%	<b>9.4</b>		<b>28.1</b>		32
≥21%	<b>11.8</b>		<b>17.6</b>		17

### *Family contribution*

Contrary to our expectations, 11.7% of supply innovators and 16.5% of non-supply innovators used family contributions and this was statistically significant at the 0.05 level. Similarly, 11.9% of administration innovators and 16.4% of non-administration innovators used family contributions and this was statistically significant at the 0.05 level. Thus, the results are not supportive of hypothesis H2.

In contrast, 16.9% of manufacturing and 11.5% of service sector businesses used family contributions at start-up and this was statistically significant at the 0.05 level. In addition, 24.1% of family businesses and 5.9% of non-family businesses used family contributions at start-up and this was highly statistically significant at the 0.01 level. This result was entirely to be expected, but it was reassuring to find the result.

Also using family contributions at start up were 29.3% of entrepreneurs with role models and 6.0% of entrepreneurs without a relative role model and this was statistically significant at the 0.01 level. It was also shown that the type of business was statistically related to the use of family contributions at the 0.05 level, in that 19.6% of registered businesses used family contributions at start-up which was substantially more than the 11.0% of limited liability businesses and was more than double the 9.7% reported for partnerships.

The 9.6% of entrepreneurs with degrees and 18.9% of entrepreneurs without degrees who used family contributions at start-up was statistically significant at the 0.01 level. Evidence showed that 18.9% of exporters and 13.2% of non-exporters used family contributions at start-up and this was statistically significant at the 0.05 level.

## **6.4 Crosstabulation Analysis – the Mean Percentage of Start-up Finance by**

### **Source**

Table 6.4 and 6.5 show cross-tabulation analysis of the mean percentage of start-up funds by source against innovation and the control variables which relate to the entrepreneurs and the businesses. Each of the sources of finance is examined in turn and the two hypotheses are tested using bivariate analysis.

#### *Own Savings*

The mean percentage amount of finance from own savings was larger for innovating businesses compared to non-innovating businesses and this applied to one measure of innovation – the product - and this relationship was statistically significant at the 0.01 level. The mean percentage amount of finance from own savings was 62.0% for product innovators and 56.2% for non-product innovators. Thus, for seven measures of innovation there was no statistically significant relationship with the mean percentage amount of finance from own savings.

Several of the control variables were found to be statistically significantly related to the mean percentage amount of finance from own savings. This was larger for family businesses (67.4%) compared to non-family businesses (54.2%) and this relationship was statistically significant at the 0.01 level. It was also larger for registered businesses (70.2%) compared to partnerships (54.4%) and limited liability firms (51.3%) and this relationship was statistically significant at the 0.01 level. The size of the business was weakly statistically significantly at the 0.10 level related to the mean percentage amount of finance from own savings.

## Partners

Only one of the innovation variables –administration innovation - was found to be statistically significantly related at the 0.05 level against the mean percentage amount of finance from partners' funds. More specifically, the mean percentage amount of finance from partners' funds was 16.1% for administration innovators and 11.6% for non-administration innovators, and this was statistically significant at the 0.05 level. The other output measures of innovation as well as the input measure of innovation – R&D expenditure - was not systematically related to the mean percentage amount of finance supplied by partners' funds.

Three of the control variables were also found to be statistically significant at the 0.10 level, or better. The contribution towards start-up funds was much larger for partnerships (28.3%) compared to registered businesses (8.0%), and limited liability businesses (10.3%) and this was highly statistically significant at the 0.01 level. This relationship, whilst expected, was reassuring. Family businesses (8.5%) had a lower mean than was found for non-family businesses (17.8%), and this relationship was also statistically significant at the 0.01 level. A weak statistical significance at the 0.10 level was found in exporting, and it was larger for exporters (15.8%) compared to non-exporters (12.6%).

## *Ordinary shares*

None of the output measures of innovation were statistically significant at the 0.10 level related to the mean percentage of start-up funds which coming ordinary shares. The input measure of innovation – the percentage of turnover spent on R&D - was however statistically significant at the 0.05 level.

Two of the control variables were highly statistically significant at the 0.01 level related to the mean percentage amount of finance at start-up from ordinary shares, and these

variables were the family business and the type of business. The mean values were lower for family businesses (11.8%) compared to non-family businesses. Not surprisingly the mean was much higher for limited liability businesses (29.0%) compared to registered businesses (12.2%) and partnerships (12.8%). One of the control variables was found to be statistically significant at the 0.05 level and that was the relative role model variable. Those without a relative role model (21.1%) had a larger mean than those entrepreneurs who had a relative role model (11.9%). Only one variable was found to be weakly statistically significant at the 0.10 level and that was exporting. The non-exporters (19.1%) had a larger mean than that reported for the exporters (13.6%).

**Table 6.4: Descriptive statistics – the mean percentage of start-up funds, by source, from own funds, partners, and ordinary shares at start-up**

	Own Funds	Z	Partners	Z	Ordinary Shares	Z	n
<b>All</b>	60.5		12.8		17.7		452
Manufacturing	59.7	-0.847	14.1	-0.404	16.4	-1.278	261
Services	61.6		12.4		19.5		191
8-19 employees	<b>63.3</b>	<b>7.818<sup>c</sup></b>	11.5	2.861	17.8	2.598	180
20-49 employees	<b>60.6</b>		15.6		15.4		128
50-99 employees	<b>54.4</b>		13.5		22.5		78
100-199 employees	<b>66.4</b>		11.1		14.2		40
200-499 employees	<b>50.4</b>		18.3		19.8		26
1-5 years old	58.1	1.399	12.0	0.971	20.1	3.182	178
6-9 years old	62.3		14.1		16.2		177
≥10 years old	61.6		14.8		16.1		97
Family Business	<b>67.4</b>	<b>-3.894<sup>a</sup></b>	<b>8.5</b>	<b>-3.763<sup>a</sup></b>	<b>11.8</b>	<b>-3.081<sup>a</sup></b>	216
Non Family Business	<b>54.2</b>		<b>17.8</b>		<b>23.1</b>		236
Male	60.7	-0.036	13.6	-0.848	17.8	-0.181	357
Female	59.6		12.5		17.5		95
18-30 years old	54.5	1.603	15.2	1.649	22.8	3.381	47
31-45 years old	61.1		13.1		16.8		285
46-55 years old	61.3		14.3		16.3		94
≥56 years old	62.4		10.2		23.8		26
Relative Role Model	63.1	-0.946	10.6	-1.471	<b>11.9</b>	<b>-2.412<sup>b</sup></b>	167
No Relative Role Model	59.0		15.0		<b>21.1</b>		285
Registered Business	<b>70.2</b>	<b>30.238<sup>a</sup></b>	<b>8.0</b>	<b>48.204<sup>a</sup></b>	<b>12.2</b>	<b>21.083<sup>a</sup></b>	204
Partnership	<b>54.4</b>		<b>28.3</b>		<b>12.8</b>		103
Limited liability	<b>51.3</b>		<b>10.3</b>		<b>29.0</b>		145
Degree	59.2	-0.611	15.1	-1.303	19.3	-1.389	209
No Degree	61.6		12.0		16.4		243
Exporter	59.1	-0.549	<b>15.8</b>	<b>-1.711<sup>c</sup></b>	<b>13.6</b>	<b>-1.712<sup>c</sup></b>	111
Non-Exporter	61.0		<b>12.6</b>		<b>19.1</b>		341
Innovator – Product	<b>62.0</b>	<b>-3.099<sup>a</sup></b>	12.8	-0.211	16.9	-0.355	333
None	<b>56.2</b>		15.1		20.0		119
Innovator – Process	60.9	-0.026	11.7	-0.819	19.2	-1.4633	172
None	60.3		14.4		16.8		260
Innovator – Work	61.8	-0.661	13.5	-0.507	17.2	-0.539	203
None	59.5		13.3		18.1		249
Innovator – Supply	60.8	-0.103	14.3	-0.373	18.3	-0.775	180
None	60.3		12.8		17.3		272
Innovator – Markets	59.4	-0.641	13.7	-1.011	17.8	-0.504	270
None	62.1		12.9		17.7		182
Innovator – Admin	61.3	-0.321	<b>16.1</b>	<b>-2.311<sup>b</sup></b>	15.4	-0.816	177
None	60.0		<b>11.6</b>		19.2		275
Innovator – Distribution	<b>62.9</b>	<b>-0.881</b>	12.4	-0.261	<b>16.8</b>	<b>-0.339</b>	184
None	<b>58.8</b>		14.1		<b>18.3</b>		268
R&D Expenditure as a % of turnover: None	<b>57.7</b>	<b>4.077</b>	<b>14.8</b>	<b>4.822</b>	<b>19.3</b>	<b>13.606<sup>b</sup></b>	60
1-2%	<b>62.4</b>		<b>13.7</b>		<b>17.3</b>		156
3-5%	<b>62.7</b>		<b>15.0</b>		<b>10.6</b>		118
6-10%	<b>53.4</b>		<b>11.2</b>		<b>29.0</b>		69
11-20%	<b>59.7</b>		<b>12.2</b>		<b>17.0</b>		32
≥21%	<b>68.3</b>		<b>5.3</b>		<b>20.9</b>		17

**Table 6.5: Descriptive statistics and ANOVAs – the mean percentage of start-up funds, by source, from bank loans and overdrafts, and family contributions**

	Bank loans and overdrafts	Z	Family contributions	Z	n
<b>All</b>	0.6		<b>6.1</b>		452
Manufacturing	0.4	-1.160	<b>7.3</b>	<b>-1.671<sup>c</sup></b>	261
Services	0.9		<b>4.4</b>		191
8-19 employees	0.4	5.727	6.5	5.309	180
20-49 employees	0.7		7.2		128
50-99 employees	0.3		3.5		78
100-199 employees	1.6		3.8		40
200-499 employees	1.9		8.6		26
1-5 years old	0.2	2.070	7.0	0.286	178
6-9 years old	0.6		5.1		177
≥10 years old	1.6		6.1		97
Family Business	0.4	-0.400	<b>10.7</b>	<b>-5.537<sup>a</sup></b>	216
Non Family Business	0.9		<b>1.9</b>		236
Male	0.7	-0.034	6.0	-0.549	357
Female	0.6		6.2		95
18-30 years old	1.4	2.088	4.7	1.350	47
31-45 years old	0.5		6.1		285
46-55 years old	0.9		7.2		94
≥56 years old	0.2		3.5		26
Relative Role Model	<b>0.1</b>	<b>-1.796<sup>c</sup></b>	<b>13.2</b>	<b>-6.926<sup>a</sup></b>	167
No Relative Role Model	<b>1.0</b>		<b>1.9</b>		285
Registered Business	0.6	0.535	<b>8.2</b>	<b>7.597<sup>b</sup></b>	204
Partnership	0.5		<b>3.5</b>		103
Limited liability	0.8		<b>5.0</b>		145
Degree	1.0	-1.389	<b>3.4</b>	<b>-2.890<sup>a</sup></b>	209
No Degree	0.4		<b>8.3</b>		243
Exporter	0.5	-0.290	6.4	-1.365	111
Non-Exporter	0.7		5.9		341
Innovator – Product	<b>0.8</b>	<b>-2.900<sup>a</sup></b>	5.9	-0.590	333
None	<b>0.3</b>		6.6		119
Innovator – Process	<b>1.2</b>	<b>-3.153<sup>a</sup></b>	5.0	-0.451	172
None	<b>0.3</b>		6.7		260
Innovator – Work	<b>1.4</b>	<b>-3.666<sup>a</sup></b>	4.9	-1.041	203
None	<b>0.1</b>		7.0		249
Innovator – Supply	<b>1.1</b>	<b>-1.903<sup>c</sup></b>	<b>4.0</b>	<b>-1.908<sup>c</sup></b>	180
None	<b>0.4</b>		<b>7.4</b>		272
Innovator – Markets	<b>1.0</b>	<b>-2.559<sup>b</sup></b>	5.7	-0.233	270
None	<b>0.1</b>		6.6		182
Innovator – Administration	<b>1.3</b>	<b>-3.069<sup>a</sup></b>	<b>4.2</b>	<b>-1.909<sup>c</sup></b>	177
None	<b>0.2</b>		<b>7.3</b>		275
Innovator – Distribution	<b>0.9</b>	<b>-1.805<sup>c</sup></b>	5.1	-0.163	184
None	<b>0.5</b>		6.7		268
R&D Expenditure as a % of turnover: None	<b>0</b>	<b>15.025<sup>b</sup></b>	<b>7.9</b>	<b>17.545<sup>a</sup></b>	60
1-2%	<b>0.1</b>		<b>4.8</b>		156
3-5%	<b>0.9</b>		<b>7.6</b>		118
6-10%	<b>1.4</b>		<b>4.7</b>		69
11-20%	<b>1.3</b>		<b>8.0</b>		32
≥21%	<b>1.5</b>		<b>2.4</b>		17

## 6.5 Regression Data Analysis

Logistic estimation was used to identify the combination of variables associated with the propensity of entrepreneurs to report that a specific source of finance was used at the start-up stage across all the six specified sources of finance. A base model relating to the control variables relating to the firm and the domestic external environment is presented. Alternative measures of innovation and R&D were then added to the base model. Entrepreneur demographic characteristics and other dimensions of human capital were also introduced.

There is no agreed goodness-of-fit measure relating to multinomial logistic regression analysis. Two commonly used coefficients are reported. Deviance as indicated by the log likelihood coefficient is a 'badness-of-fit' measure, and weak 'explanatory' models generally report higher deviance coefficients. The pseudo  $R^2$  coefficient provides an indication of the 'explanatory' power of the model. While similar in principle to the adjusted  $R^2$  reported in ordinary least squares (OLS) regression models, non-OLS regression models generally report lower pseudo  $R^2$  coefficients. The log likelihood coefficients and the pseudo  $R^2$  coefficients are reported.

Table 6.6 provides a key of the variables which have been included in the econometric analysis. Table 6.7 provides a correlation matrix of the variables used in this chapter. There was no evidence to suggest the presence of multicollinearity. Thus, the results presented in the chapter should be valid.

**Table 6.6 Key of variables included in the regression analysis models**

Variables	
1. Sector	1=Manufacturing and 0 =Services
2. Size	The number of employees (log)
3. Age of Business	The age of the business (log)
4. Family Business	1=Family business and 0=Non-family business
5. Gender	1=Male and 0=Female
6. Age of Owner-Manager	The age of the entrepreneur (log)
7. Relative Role Model	1=Relative role model and 0=No relative role model
8. Registered business	1=Registered business and 0=not a registered business. This is the excluded comparison dummy variable.
8. Limited liability	1= limited liability and 0=not a limited liability. Dummy variable type of business and with registered business as the excluded comparison type of business.
9. Partnership	1=partnership and 0=not a partnership. Dummy variable type of business and with registered business as the excluded comparison type of business.
10. Degree	1=Degree and 0=no degree
11. Exporter	1=Exporter and 0=Non-exporter
12. Innovator – Product	1=Product innovator and 0=non-product innovator
13. Innovator – Process	1=Process innovator and 0=non-process innovator
14. Innovator – Work	1=Work innovator and 0=non-work innovator
15. Innovator – Supply	1=Supply innovator and 0=non-supply innovator
16. Innovator – Markets	1=Market innovator and 0=non-market innovator
17. Innovator – Administration	1=Administration innovation and 0=non-administration innovation
18. Innovator – Distribution	1=Distribution innovation and 0=non-distribution innovation
19. R&D Expenditure as a % of turnover: None	1=No expenditure on R&D and 0=expenditure on R&D. Dummy variable which is the excluded comparison dummy.
20. 1-2%	1=R&D expenditure is 1-2% of turnover and 0=R&D expenditure is not 1-2% of turnover.
21. 3-5%	1=R&D expenditure is 3-5% of turnover and 0=R&D expenditure is not 3-5% of turnover.
22. 6-10%	1=R&D expenditure is 6-10% of turnover and 0=R&D expenditure is not 6-10% of turnover.
23. 11-20%	1=R&D expenditure is 11-20% of turnover and 0=R&D expenditure is not 11-20% of turnover.
24. $\geq 21\%$	1=R&D expenditure is $\geq 21\%$ of turnover and 0=R&D expenditure is not $\geq 21\%$ of turnover.

**Table 6.7: Correlation Matrix**

Variables	1	2	3	4	5	6	7	8	9	10
1. Sector	1.000									
2. Size	0.087	1.000								
3. Age of Business	0.192 <sup>a</sup>	0.184 <sup>a</sup>	1.000							
4. Family Business	0.002	0.039	0.139 <sup>a</sup>	1.000						
5. Gender	0.009	0.010	0.111 <sup>b</sup>	-0.007	1.000					
6. Age of Owner-Manager	0.079	-0.085	0.211 <sup>a</sup>	0.034	0.163 <sup>a</sup>	1.000				
7. Relative Role Model	0.024	-0.010	0.047	0.506 <sup>a</sup>	0.035	0.041	1.000			
8. Type of Business	-0.070	0.062	0.088	-0.172 <sup>a</sup>	0.022	0.132 <sup>a</sup>	-0.122 <sup>a</sup>	1.000		
9. Degree	-0.132 <sup>a</sup>	-0.132 <sup>a</sup>	-0.134 <sup>a</sup>	-0.203 <sup>a</sup>	-0.033	-0.240 <sup>a</sup>	-0.195 <sup>a</sup>	0.073	1.000	
10. Exporter	0.155 <sup>a</sup>	0.155 <sup>a</sup>	-0.002	0.041	-0.072	-0.107 <sup>b</sup>	0.001	0.050	0.120 <sup>b</sup>	1.000
11. Innovator – Product	0.017	0.017	0.010	0.079	-0.025	-0.113 <sup>b</sup>	-0.021	0.084	0.172 <sup>a</sup>	0.096 <sup>b</sup>
12. Innovator – Process	0.025	0.025	0.002	-0.011	0.002	-0.164 <sup>a</sup>	-0.015	0.092	0.059	0.093 <sup>b</sup>
13. Innovator – Work	-0.191 <sup>a</sup>	-0.191 <sup>a</sup>	-0.004	-0.045	0.018	-0.177 <sup>a</sup>	-0.028	0.038	0.126 <sup>a</sup>	0.033
14. Innovator – Supply	-0.018	-0.018	-0.050	-0.027	-0.035	-0.168 <sup>a</sup>	0.023	-0.039	0.052	0.071
15. Innovator – Markets	-0.072	-0.072	-0.113 <sup>b</sup>	-0.054	-0.014	-0.180 <sup>a</sup>	-0.026	0.043	0.210 <sup>a</sup>	0.217 <sup>a</sup>
16. Innovator – Administration	-0.250 <sup>a</sup>	-0.250 <sup>a</sup>	-0.041	-0.096 <sup>b</sup>	-0.076	-0.161 <sup>a</sup>	-0.041	0.068	0.156 <sup>a</sup>	0.079 <sup>c</sup>
17. Innovator – Distribution	-0.057	-0.057	-0.038	-0.008	-0.004	-0.071	0.028	0.062	0.035	0.113 <sup>b</sup>
18. R&D Expenditure as a % of turnover	0.015	0.165 <sup>a</sup>	-0.084	0.014	-0.023	-0.143 <sup>a</sup>	-0.069	0.058	0.170 <sup>a</sup>	0.023

**N=384**

**Table 6.7: Correlation Matrix**

Variables	11	12	13	14	15	16	17	18
1. Sector								
2. Size								
3. Age of Business								
4. Family Business								
5. Gender								
6. Age of Owner-Manager								
7. Relative Role Model								
8. Type of Business								
9. Degree								
10. Exporter								
11. Innovator – Product	1.000							
12. Innovator – Process	0.313 <sup>a</sup>	1.000						
13. Innovator – Work	0.217 <sup>a</sup>	0.392 <sup>a</sup>	1.000					
14. Innovator – Supply	0.168 <sup>a</sup>	0.256 <sup>a</sup>	0.419 <sup>a</sup>	1.000				
15. Innovator – Markets	0.267 <sup>a</sup>	0.179 <sup>a</sup>	0.306 <sup>a</sup>	0.299 <sup>a</sup>	1.000			
16. Innovator – Administration	0.181 <sup>a</sup>	0.314 <sup>a</sup>	0.524 <sup>a</sup>	0.347 <sup>a</sup>	0.372 <sup>a</sup>	1.000		
17. Innovator – Distribution	0.219 <sup>a</sup>	0.324 <sup>a</sup>	0.402 <sup>a</sup>	0.375 <sup>a</sup>	0.240 <sup>a</sup>	0.452 <sup>a</sup>	1.000	
18. R&D Expenditure as a % of turnover	0.399 <sup>a</sup>	0.359 <sup>a</sup>	0.268 <sup>a</sup>	0.209 <sup>a</sup>	0.238 <sup>a</sup>	0.236 <sup>a</sup>	0.257 <sup>a</sup>	1.000

**N=384**

### 6.5.1 Results

The researcher presents the findings for each of the six dependent variables, in turn, below.

#### *Own funds*

Logistic regression analysis is utilized when the dependent variable takes values of '0' or '1'. Maximum likelihood estimate models were conducted with regard to the dichotomous dependent variable relating to 'the use of own funds at start-up' (allocated a value of '1') and 'no use of own funds at start-up' respondents (allocated a value of '0'). Control variables plus the product innovation variable relating to the propensity to report the 'the use of own funds at start-up' outcome were included in Model 1 in Table 2. The model has a Nagelkerke  $R^2$  of 0.177 and is significant at the 0.01 level. The product innovation variable is statistically significant at the 0.01 level. Thus, the evidence supports hypothesis H1.

In models 2 to 8, product innovation was replaced with each of the other measures of innovation, one at a time. Thus, the independent variables relating to process innovation, work, supply, markets, administration, distribution and R&D expenditure were individually included in Models 2 to 8, respectively.

Models 2 to 8 are individually statistically significant at the 0.01 level. It is found that the Nagelkerke  $R^2$  ranges from 0.154 in model 2 (where process innovation is included) to 0.185 in model 8 (where R&D expenditure is included). In models 6 and 7 the administration innovation and the distribution innovation variables are statistically significant at the 0.01 level, whilst in model 8 two of the R&D expenditure dummies, 11-20%, and  $\geq 21\%$  were also highly statistically significant at the 0.01 level. Thus the evidence in models 6, 7 and 8 supports hypothesis H1.

However, in models 2, 3, 4, 5 and 8 the innovation variables are not statistically significant and this does not support hypothesis H1.

Several other control variables that relate to the propensity to use own funds at start-up are found to be consistently statistically significant in models 1 to 8. Family businesses were more likely than non-family businesses to use own funds at start-up and this relationship was statistically significant at the 0.05 level. Exporting firms were more likely than exporters to use own funds at start-up and this relationship was highly statistically significant at the 0.01 level, whilst limited liability businesses were less likely than registered businesses to use own funds at start-up.

**Table 6.8: Estimates of a logit regression model of the probability of using own funds at start-up. The Odds Ratios**

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Sector	1.203 (0.382)	1.203 (0.376)	1.283 (0.410)	1.212 (0.383)	1.196 (0.375)	1.505 (0.496)	1.280 (0.407)	1.321 (0.430)
Size	0.872 (0.155)	0.935 (0.163)	0.925 (0.163)	0.922 (0.162)	0.960 (0.167)	0.900 (0.159)	0.919 (0.164)	0.965 (0.171)
Age of Business	1.125 (0.282)	1.065 (0.267)	1.047 (0.261)	1.075 (0.264)	1.056 (0.264)	1.084 (0.269)	1.111 (0.270)	1.105 (0.289)
Family Business	<b>2.228</b> <b>(0.858)<sup>b</sup></b>	<b>2.494</b> <b>(0.952)<sup>b</sup></b>	<b>2.531</b> <b>(0.968)<sup>b</sup></b>	<b>2.621</b> <b>(1.008)<sup>b</sup></b>	<b>2.592</b> <b>(0.953)<sup>b</sup></b>	<b>2.690</b> <b>(1.038)<sup>b</sup></b>	<b>2.727</b> <b>(1.059)<sup>b</sup></b>	<b>2.589</b> <b>(0.991)<sup>b</sup></b>
Gender	1.532 (0.546)	1.532 (0.538)	1.495 (0.527)	1.527 (0.539)	1.523 (0.535)	1.624 (0.578)	1.496 (0.537)	1.410 (0.517)
Age of Owner-Manager	1.020 (0.817)	1.020 (0.812)	1.041 (0.839)	1.029 (0.823)	0.998 (0.712)	1.094 (0.879)	0.895 (0.727)	0.997 (0.848)
Relative Role Model	0.939 (0.359)	0.934 (0.354)	0.930 (0.353)	0.922 (0.351)	0.932 (0.354)	0.930 (0.356)	0.882 (0.340)	0.839 (0.332)
Limited Liability	<b>0.438</b> <b>(0.144)<sup>a</sup></b>	<b>0.406</b> <b>(0.144)<sup>a</sup></b>	<b>0.395</b> <b>(0.141)<sup>a</sup></b>	<b>0.468</b> <b>(0.138)<sup>a</sup></b>	<b>0.426</b> <b>(0.135)<sup>a</sup></b>	<b>0.426</b> <b>(0.147)<sup>a</sup></b>	<b>0.429</b> <b>(0.156)<sup>a</sup></b>	<b>0.424</b> <b>(0.156)<sup>a</sup></b>
Partnership	1.089 (1.332)	1.179 (1.358)	1.107 (1.372)	1.106 (1.372)	1.085 (1.339)	1.134 (1.343)	1.175 (1.315)	1.138 (1.343)
Degree	0.982 (0.327)	1.132 (0.369)	1.132 (0.371)	1.174 (0.385)	1.134 (0.371)	1.111 (0.365)	1.191 (0.399)	1.195 (0.395)
Exporter	<b>1.579</b> <b>(0.343)<sup>a</sup></b>	<b>1.484</b> <b>(0.396)<sup>a</sup></b>	<b>1.513</b> <b>(0.309)<sup>a</sup></b>	<b>1.525</b> <b>(0.317)<sup>a</sup></b>	<b>1.530</b> <b>(0.319)<sup>a</sup></b>	<b>1.474</b> <b>(0.399)<sup>a</sup></b>	<b>1.499</b> <b>(0.341)<sup>a</sup></b>	<b>1.464</b> <b>(0.329)<sup>a</sup></b>
Innovator Product	<b>2.538</b> <b>(0.885)<sup>a</sup></b>	-----	-----	-----	-----	-----	-----	-----
Innovator Process	-----	1.409 (0.459)	-----	-----	-----	-----	-----	-----
Innovator Work	-----	-----	1.413 (0.458)	-----	-----	-----	-----	-----
Innovator Supply	-----	-----	-----	1.602 (0.525)	-----	-----	-----	-----
Innovator Markets	-----	-----	-----	-----	1.045 (0.312)	-----	-----	-----
Innovator Administration	-----	-----	-----	-----	-----	<b>2.209</b> <b>(0.380)<sup>a</sup></b>	-----	-----
Innovator Distribution	-----	-----	-----	-----	-----	-----	<b>2.777</b> <b>(0.373)<sup>a</sup></b>	-----
R&D (1-2%)	-----	-----	-----	-----	-----	-----	-----	1.993 (1.005)
R&D (3-5%)	-----	-----	-----	-----	-----	-----	-----	1.635 (0.803)
R&D (6-10%)	-----	-----	-----	-----	-----	-----	-----	0.623 (0.314)
R&D (11-20%)	-----	-----	-----	-----	-----	-----	-----	<b>2.699 (0.228)<sup>a</sup></b>
R&D (≥21%)	-----	-----	-----	-----	-----	-----	-----	<b>3.849 (0.257)<sup>a</sup></b>
Log likelihood	-146.54	-149.48	-149.47	-148.97	-150.02	-147.38	-145.34	-144.95
Nagelkerke R <sup>2</sup>	0.177	0.154	0.155	0.159	0.149	0.169	0.187	0.185

n=452

### *Partners*

Maximum likelihood estimate models were conducted with regard to the dichotomous dependent variable relating to ‘the use of partners’ funds at start-up’ (allocated a value of ‘1’) and ‘no use of partners’ funds at start-up’ respondents (allocated a value of ‘0’). Control variables plus the product innovation variable relating to the propensity to report the ‘the use of partners’ funds at start-up’ outcome were included in Model 9 in Table 3. The model has a Nagelkerke  $R^2$  of 0.163 and is significant at the 0.01 level. The product innovation variable is not statistically significant at the 0.05 level. Thus, the evidence with regard to product innovation does not support hypothesis H2.

In models 10 to 16 product innovation was replaced in turn with each of the other measures of innovation. Thus, the independent variables relating to process innovation, work, supply, markets, administration, distribution and R&D expenditure were individually included in Models 10 to 16, respectively.

Models 10 to 16 are individually statistically significant at the 0.01 level. The Nagelkerke  $R^2$  ranges from 0.162 in model 15 (with distribution innovation included) to 0.187 in model 16 (with the R&D expenditure dummy variables). In models 13 and 14 the markets innovation and the administration innovation variables are statistically significant at the 0.01 and 0.05 level, respectively. Thus the evidence in models 13 and 14 with regard to market and administration innovation supports hypothesis H2. However, in models 10, 11, 12, 15, and 16 the innovation variables are not statistically significant and this does not support hypothesis H2.

Several other control variables are found to be consistently statistically significant in models 9 to 16 which relate to the propensity to use own funds at start-up. Family businesses were less likely than non-family businesses, and exporters

were more likely than non-exporters to use partners' funds at start-up and both of these relationships were statistically significant at the 0.05 level. Partnerships were more likely than registered businesses to use partners' funds at start-up and this relationship was statistically significant at the 0.01 level.

**Table 6.9: Estimates of a logit regression model of the probability of using partners funds at start-up. The Odds Ratios**

	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Sector	0.867 (0.205)	0.883 (0.206)	0.935 (0.223)	0.884 (0.206)	0.890 (0.210)	1.004 (0.245)	0.879 (0.206)	0.837 (0.199)
Size	0.989 (0.125)	1.012 (0.126)	0.980 (0.123)	0.998 (0.124)	0.991 (0.124)	0.983 (0.123)	1.006 (0.125)	1.044 (0.132)
Age of Business	0.981 (0.186)	0.979 (0.186)	0.971 (0.184)	0.981 (0.187)	1.001 (0.191)	0.967 (0.186)	0.978 (0.186)	0.941 (0.183)
Family Business	<b>0.438</b> <b>(0.121)<sup>a</sup></b>	<b>0.450</b> <b>(0.123)<sup>a</sup></b>	<b>0.457</b> <b>(0.125)<sup>a</sup></b>	<b>0.452</b> <b>(0.124)<sup>a</sup></b>	<b>0.452</b> <b>(0.124)<sup>a</sup></b>	<b>0.471</b> <b>(0.130)<sup>a</sup></b>	<b>0.449</b> <b>(0.123)<sup>a</sup></b>	<b>0.460</b> <b>(0.131)<sup>a</sup></b>
Gender	1.219 (0.347)	1.221 (0.348)	1.197 (0.342)	1.222 (0.348)	1.192 (0.339)	1.258 (0.360)	1.218 (0.347)	1.270 (0.369)
Age of Owner-Manager	0.869 (0.507)	0.803 (0.473)	0.952 (0.561)	0.880 (0.516)	0.927 (0.544)	0.967 (0.568)	0.839 (0.488)	0.719 (0.430)
Relative Role Model	1.265 (0.350)	1.250 (0.345)	1.244 (0.343)	1.243 (0.342)	1.243 (0.343)	1.228 (0.341)	1.251 (0.345)	1.249 (0.354)
Limited Liability Partnership	0.886 (0.243)	0.860 (0.237)	0.885 (0.244)	0.869 (0.238)	0.888 (0.244)	0.903 (0.250)	0.869 (0.239)	0.870 (0.257)
Degree	<b>4.049</b> <b>(0.417)<sup>a</sup></b>	<b>3.886</b> <b>(0.411)<sup>a</sup></b>	<b>4.150</b> <b>(0.404)<sup>a</sup></b>	<b>3.984</b> <b>(0.444)<sup>a</sup></b>	<b>4.138</b> <b>(0.400)<sup>a</sup></b>	<b>4.032</b> <b>(0.416)<sup>a</sup></b>	<b>3.931</b> <b>(0.412)<sup>a</sup></b>	<b>4.088</b> <b>(0.413)<sup>a</sup></b>
Exporter	1.007 (0.248)	1.030 (0.250)	1.019 (0.248)	1.034 (0.251)	1.000 (0.245)	1.001 (0.245)	1.030 (0.250)	1.094 (0.209)
Innovator Product	<b>1.873</b> <b>(0.507)<sup>b</sup></b>	<b>1.870</b> <b>(0.505)<sup>b</sup></b>	<b>1.876</b> <b>(0.506)<sup>b</sup></b>	<b>1.862</b> <b>(0.502)<sup>b</sup></b>	<b>1.758</b> <b>(0.482)<sup>b</sup></b>	<b>1.795</b> <b>(0.489)<sup>b</sup></b>	<b>1.875</b> <b>(0.508)<sup>b</sup></b>	<b>1.804</b> <b>(0.499)<sup>b</sup></b>
Innovator Process	1.193 (0.321)	----- (0.210)	-----	-----	-----	-----	-----	-----
Innovator Work	-----	-----	1.352 (0.320)	-----	-----	-----	-----	-----
Innovator Supply	-----	-----	-----	1.127 (0.261)	-----	-----	-----	-----
Innovator Markets	-----	-----	-----	-----	<b>2.380</b> <b>(0.326)<sup>a</sup></b>	-----	-----	-----
Innovator Administration	-----	-----	-----	-----	-----	<b>1.614</b> <b>(0.387)<sup>b</sup></b>	-----	-----
Innovator Distribution	-----	-----	-----	-----	-----	-----	0.961 (0.220)	-----
R&D (1-2%)	-----	-----	-----	-----	-----	-----	-----	0.923 (0.345)
R&D (3-5%)	-----	-----	-----	-----	-----	-----	-----	1.361 (0.517)
R&D (6-10%)	-----	-----	-----	-----	-----	-----	-----	0.713 (0.316)
R&D (11-20%)	-----	-----	-----	-----	-----	-----	-----	0.815 (0.433)
R&D (≥21%)	-----	-----	-----	-----	-----	-----	-----	0.186 (0.765)
Log likelihood	-246.32	-246.42	-245.73	-246.41	-245.69	-244.55	-246.53	-242.02
Pseudo R <sup>2</sup>	0.163	0.163	0.167	0.163	0.167	0.173	0.162	0.187

n=384

### *Ordinary shares*

Maximum likelihood estimate models were conducted with regard to the dichotomous dependent variable relating to ‘the use of funds from ordinary shares at start-up’ (allocated a value of ‘1’) and ‘no use of funds from ordinary shares at start-up’ respondents (allocated a value of ‘0’). Control variables plus the product innovation variable relating to the propensity to report the ‘the use of funds from ordinary shares at start-up’ outcome were included in Model 17 in Table 6.10. The model has a Nagelkerke  $R^2$  of 0.090 and is significant at the 0.01 level. The product innovation variable is not statistically significant at the 0.10 level, or better. Thus, the evidence with regard to product innovation does not support hypothesis H2.

In models 18 to 24 product innovation was replaced with each of the other measures of innovation, one at a time. Thus, the independent variables relating to process innovation, work, supply, markets, administration, distribution and R&D expenditure were individually included in Models 18 to 24, respectively.

Models 18 to 24 are individually statistically significant at the 0.01 level. The Nagelkerke  $R^2$  ranges from 0.090 in models 3, 5 and 7 (where the innovation variables are work, markets and distribution, respectively) to 0.128 in model 24. In models 18 and 23, the process innovation and the distribution innovation variables are statistically significant at the 0.05 and 0.01 level, respectively. In model 24, two of the R&D expenditure dummy variables, 6-10%, and ( $\geq 21\%$ ) were statistically significant at the 0.05 and 0.01 level, respectively.

Thus the evidence in models 18, 23 and 24 supports hypothesis H2. However, in the other models in Table 6.10 the innovation variables were not statistically significant and this does not support hypothesis H2.

Several other control variables are found to be consistently statistically significant in models 17 to 24 which relate to the propensity to use ordinary shares at start-up. Family businesses were less likely than non-family businesses, and exporting firms were less likely than exporters to use ordinary shares at start-up, and both of these relationships were statistically significant at the 0.01 level. The limited liability businesses were more likely than the registered businesses to use partners' funds at start up and this relationship was statistically significant at the 0.01 level.

**Table 6.10: Estimates of a logit regression model of the probability of using ordinary shares at start-up. The Odds Ratios**

	Model 17	Model 18	Model 19	Model 20	Model 21	Model 22	Model 23	Model 24
Sector	0.813 (0.179)	0.808 (0.179)	0.820 (0.185)	0.813 (0.180)	0.813 (0.180)	0.741 (0.171)	0.817 (0.181)	0.809 (0.184)
Size	1.012 (0.125)	0.979 (0.120)	0.993 (0.122)	0.984 (0.121)	0.999 (0.121)	1.018 (0.125)	0.995 (0.121)	0.949 (0.118)
Age of Business	0.836 (0.149)	0.840 (0.150)	0.838 (0.192)	0.843 (0.151)	0.842 (0.151)	0.844 (0.151)	0.841 (0.151)	0.898 (0.165)
Family Business	<b>0.772</b> <b>(0.096)<sup>a</sup></b>	<b>0.759</b> <b>(0.092)<sup>a</sup></b>	<b>0.761</b> <b>(0.092)<sup>a</sup></b>	<b>0.769</b> <b>(0.095)<sup>a</sup></b>	<b>0.761</b> <b>(0.092)<sup>a</sup></b>	<b>0.734</b> <b>(0.086)<sup>a</sup></b>	<b>0.761</b> <b>(0.092)<sup>a</sup></b>	<b>0.694</b> <b>(0.092)<sup>a</sup></b>
Gender	0.987 (0.259)	0.980 (0.258)	0.984 (0.258)	0.987 (0.259)	0.985 (0.259)	0.965 (0.254)	0.985 (0.258)	0.909 (0.245)
Age of Owner-Manager	0.460 (0.259)	0.526 (0.298)	0.482 (0.273)	0.501 (0.283)	0.477 (0.268)	0.425 (0.241)	0.476 (0.267)	0.514 (0.295)
Relative Role Model	0.833 (0.217)	0.839 (0.219)	0.837 (0.218)	0.831 (0.217)	0.837 (0.218)	0.847 (0.221)	0.832 (0.216)	0.882 (0.234)
Limited Liability	<b>2.397</b> <b>(0.098)<sup>a</sup></b>	<b>2.413</b> <b>(0.103)<sup>a</sup></b>	<b>2.404</b> <b>(0.100)<sup>a</sup></b>	<b>2.399</b> <b>(0.099)<sup>a</sup></b>	<b>2.403</b> <b>(0.100)<sup>a</sup></b>	<b>2.389</b> <b>(0.097)<sup>a</sup></b>	<b>2.405</b> <b>(0.101)<sup>a</sup></b>	<b>2.653</b> <b>(0.107)<sup>a</sup></b>
Partnership	0.907 (0.719)	0.929 (0.725)	0.918 (0.722)	0.920 (0.722)	0.918 (0.722)	0.911 (0.720)	0.919 (0.722)	0.921 (0.721)
Degree	1.061 (0.248)	1.048 (0.244)	1.043 (0.241)	1.052 (0.245)	1.037 (0.242)	1.059 (0.246)	1.046 (0.242)	0.980 (0.230)
Exporter	<b>0.671</b> <b>(0.086)<sup>a</sup></b>	<b>0.665</b> <b>(0.085)<sup>a</sup></b>	<b>0.673</b> <b>(0.087)<sup>a</sup></b>	<b>0.671</b> <b>(0.086)<sup>a</sup></b>	<b>0.666</b> <b>(0.087)<sup>a</sup></b>	<b>0.687</b> <b>(0.091)<sup>a</sup></b>	<b>0.663</b> <b>(0.085)<sup>a</sup></b>	<b>0.685</b> <b>(0.080)<sup>a</sup></b>
Innovator Product	0.871 (0.222)	-----	-----	-----	-----	-----	-----	-----
Innovator Process	-----	<b>1.328<sup>b</sup></b> <b>(0.295)</b>	-----	-----	-----	-----	-----	-----
Innovator Work	-----	-----	1.059 (0.238)	-----	-----	-----	-----	-----
Innovator Supply	-----	-----	-----	1.205 (0.266)	-----	-----	-----	-----
Innovator Markets	-----	-----	-----	-----	1.057 (0.244)	-----	-----	-----
Innovator Administration	-----	-----	-----	-----	-----	0.713 (0.168)	-----	-----
Innovator Distribution	-----	-----	-----	-----	-----	-----	<b>1.799</b> <b>(0.045)<sup>a</sup></b>	-----
R&D (1-2%)	-----	-----	-----	-----	-----	-----	-----	1.595 (0.594)
R&D (3-5%)	-----	-----	-----	-----	-----	-----	-----	0.774 (0.306)
R&D (6-10%)	-----	-----	-----	-----	-----	-----	-----	<b>2.263</b> <b>(0.939)<sup>b</sup></b>
R&D (11-20%)	-----	-----	-----	-----	-----	-----	-----	<b>1.812</b> <b>(1.323)</b>
R&D (≥21%)	-----	-----	-----	-----	-----	-----	-----	<b>2.618 (0.311)<sup>a</sup></b>
Log likelihood	-262.22	-261.56	-262.33	-262.01	-262.34	-261.32	-262.24	-255.62
Pseudo R <sup>2</sup>	0.090	0.094	0.090	0.091	0.090	0.096	0.090	0.128

n=384

### *Family contribution*

Maximum likelihood estimate models were conducted with regard to the dichotomous dependent variables relating to ‘the use of family contribution funds at start-up’ (allocated a value of ‘1’) and ‘no use of family contribution funds at start-up’ responses (allocated a value of ‘0’). Control variables plus the product innovation variable relating to the propensity to report the ‘the use of trade credit funds at start-up’ outcome were included in Model 25 in Table 6.11. The model has a Nagelkerke  $R^2$  of 0.171 and is significant at the 0.01 level. The product innovation variable is not statistically significant at the 0.10 level or better. Thus, the evidence on product innovation does not support hypothesis H2.

In models 26 to 32 product innovation was replaced with each of the other measures of innovation, one at a time. Thus, the independent variables relating to process innovation, work, supply, markets, administration, distribution and R&D expenditure were individually included in Models 26 to 32, respectively.

Models 26 to 32 are individually statistically significant at the 0.01 level. In Table 6.11 the Nagelkerke  $R^2$  ranges from 0.236 in models 26, 29 and 31 (where process, markets and distribution innovation are included).

In models 28, 30 and 32, the supply innovation, the administration innovation and the R&D expenditure variables are statistically significant at the 0.01, 0.01 and 0.10 level, respectively, although it needs to be noted that two of the dummy variables, on R&D expenditure relating to 3-5% and 6-10%, were not statistically significant. Thus the evidence in models 28, 30 and 32 supports hypothesis H2.

Several other control variables were found to be consistently statistically significant in models 25 to 32 which relate to the propensity to use family contributions at start-up. Family businesses were more likely than non-family

businesses to use family contributions at start-up, as were those entrepreneurs with role models and the exporting firms.

**Table 6.11: Estimates of a logit regression model of the probability of using family contributions at start-up. The Odds Ratios**

	Model 25	Model 26	Model 27	Model 28	Model 29	Model 30	Model 31	Model 32
Sector	<b>1.391</b> (0.143) <sup>a</sup>	<b>1.407</b> (0.149) <sup>a</sup>	<b>1.355</b> (0.139) <sup>a</sup>	<b>1.676</b> (0.192) <sup>a</sup>	<b>1.406</b> (0.149) <sup>a</sup>	<b>1.338</b> (0.138) <sup>a</sup>	<b>1.402</b> (0.148) <sup>a</sup>	<b>1.353</b> (0.187) <sup>a</sup>
Size	0.964 (0.165)	0.998 (0.168)	1.004 (0.170)	0.992 (0.154)	0.991 (0.166)	0.994 (0.167)	0.991 (0.166)	0.987 (0.171)
Age of Business	1.276 (0.336)	1.278 (0.336)	1.282 (0.337)	1.270 (0.296)	1.278 (0.336)	1.291 (0.339)	1.278 (0.336)	1.243 (0.345)
Family Business	<b>1.961</b> (0.252) <sup>a</sup>	<b>2.027</b> (0.272) <sup>a</sup>	<b>2.010</b> (0.225) <sup>a</sup>	<b>2.044</b> (0.227) <sup>a</sup>	<b>2.029</b> (0.247) <sup>b</sup>	<b>1.986</b> (0.259) <sup>a</sup>	<b>2.023</b> (0.271) <sup>a</sup>	<b>2.192</b> (0.253) <sup>a</sup>
Gender	1.328 (0.505)	1.324 (0.506)	1.310 (0.498)	1.029 (0.346)	1.308 (0.497)	1.291 (0.491)	1.308 (0.497)	1.242 (0.482)
Age of Owner-Manager	0.381 (0.294)	0.358 (0.278)	0.359 (0.277)	0.365 (0.220)	0.379 (0.292)	0.353 (0.273)	0.355 (0.289)	0.346 (0.351)
Relative Role Model	<b>4.317</b> (0.323) <sup>a</sup>	<b>4.208</b> (0.382) <sup>a</sup>	<b>4.206</b> (0.380) <sup>a</sup>	<b>4.292</b> (0.319) <sup>a</sup>	<b>4.215</b> (0.326) <sup>a</sup>	<b>4.246</b> (0.335) <sup>a</sup>	<b>4.221</b> (0.334) <sup>a</sup>	<b>4.590</b> (0.356) <sup>a</sup>
Limited Liability	0.539 (0.539)	0.468 (0.517)	0.480 (0.517)	0.499 (0.507)	0.498 (0.522)	0.499 (0.520)	0.499 (0.525)	0.413 (0.523)
Partnership	<b>0.746</b> (0.342)	0.710 (0.325)	0.702 (0.322)	0.705 (0.328)	0.723 (0.330)	0.723 (0.330)	0.720 (0.329)	0.682 (0.314)
Degree	0.597 (0.203)	0.606 (0.206)	0.612 (0.208)	0.509 (0.158)	0.601 (0.207)	0.613 (0.208)	0.607 (0.206)	0.584 (0.208)
Exporter	<b>1.600</b> (0.165) <sup>a</sup>	<b>1.592</b> (0.162) <sup>a</sup>	<b>1.571</b> (0.156) <sup>a</sup>	<b>1.418</b> (0.167) <sup>a</sup>	<b>1.563</b> (0.163) <sup>a</sup>	<b>1.595</b> (0.165) <sup>a</sup>	<b>1.582</b> (0.155) <sup>a</sup>	<b>1.653</b> (0.143) <sup>a</sup>
Innovator Product	1.324 (0.471)	-----	-----	-----	-----	-----	-----	-----
Innovator Process	-----	0.887 (0.275)	-----	-----	-----	-----	-----	-----
Innovator Work	-----	-----	0.847 (0.261)	-----	-----	-----	-----	-----
Innovator Supply	-----	-----	-----	<b>0.649</b> (0.085) <sup>a</sup>	-----	-----	-----	-----
Innovator Markets	-----	-----	-----	-----	1.058 (0.334)	-----	-----	-----
Innovator Administration	-----	-----	-----	-----	-----	<b>0.828</b> (0.065) <sup>a</sup>	-----	-----
Innovator Distribution	-----	-----	-----	-----	-----	-----	1.026 (0.305)	-----
R&D (1-2%)	-----	-----	-----	-----	-----	-----	-----	<b>0.437</b> (0.218) <sup>c</sup>
R&D (3-5%)	-----	-----	-----	-----	-----	-----	-----	<b>0.819</b> (0.403)
R&D (6-10%)	-----	-----	-----	-----	-----	-----	-----	<b>0.495</b> (0.305)
R&D (11-20%)	-----	-----	-----	-----	-----	-----	-----	<b>2.350</b> (0.070) <sup>a</sup>
R&D (≥21%)	-----	-----	-----	-----	-----	-----	-----	<b>2.502</b> (0.030) <sup>a</sup>
Log likelihood	-155.83	-156.08	-156.01	-158.74	-156.14	-155.98	-156.15	-150.373
Pseudo R <sup>2</sup>	0.2387	0.236	0.237	0.248	0.236	0.237	0.236	0.279

n=384

### *Bank Loans and Overdrafts*

Maximum likelihood estimate models were conducted with regard to the dichotomous dependent variable relating to 'the use of bank loans and overdrafts funds at start-up' (allocated a value of '1') and 'no use of bank loans and overdrafts funds at start-up' respondents (allocated a value of '0'). Control variables plus the product innovation variable relating to the propensity for reporting the 'the use of bank loans and overdrafts funds at start-up' outcome were included in Model 33 in Table 6.12. The model has a Nagelkerke  $R^2$  of 0.120 and is significant at the 0.01 level. The product innovation variable is statistically significant at the 0.01 level. Thus, the evidence supports hypothesis H2.

In models 34 to 40 product innovation was replaced with each of the other measures of innovation, one at a time. Thus, the independent variables relating to process innovation, work, supply, markets, administration, distribution and R&D expenditure were individually included in Models 34 to 40, respectively.

Models 34 to 40 are individually statistically significant at the 0.01 level. The Nagelkerke  $R^2$  ranges from 0.127 in model 36 (where supply innovation is included) to 0.214 in model 35 (in which work innovation is included). In models 34 to 39, the seven input measures of innovation are all statistically significant at the 0.05 level or better, and thus the evidence in models 34 to 39 supports hypothesis H2. However, the R&D expenditure dummy variables were all not statistically significant and this did not support hypothesis H2.

Two control variables were found to be consistently statistically significant in models 33 to 40 which relate to the propensity for the use of bank loans and overdrafts at start-up. Larger businesses were more likely than smaller businesses to use bank loans and overdrafts at start-up and this relationship was weakly statistically significant at the 0.10 level. Entrepreneurs with relative role models were less likely to use bank loans and overdrafts at start-up than those entrepreneurs without role models and this also was weakly statistically significant at the 0.10 level.

**Table 6.12: Estimates of a logit regression model of the probability of using bank loans and overdrafts at start-up. The Odds Ratios** (n=384)

	Model 33	Model 34	Model 35	Model 36	Model 37	Model 38	Model 39	Model 40
Sector	0.564 (0.333)	0.550 (0.341)	0.574 (0.471)	0.540 (0.318)	0.641 (0.386)	0.590 (0.495)	0.577 (0.346)	0.552 (0.393)
Size	<b>1.693</b> <b>(0.526)<sup>c</sup></b>	<b>1.610</b> <b>(0.495)<sup>c</sup></b>	<b>1.496</b> <b>(0.459)<sup>c</sup></b>	<b>1.629</b> <b>(0.502)<sup>c</sup></b>	<b>1.647</b> <b>(0.500)<sup>c</sup></b>	<b>1.661</b> <b>(0.507)<sup>c</sup></b>	<b>1.713</b> <b>(0.512)<sup>c</sup></b>	<b>1.717</b> <b>(0.558)<sup>c</sup></b>
Age of Business	1.002 (0.448)	1.021 (0.453)	0.920 (0.416)	1.044 (0.482)	1.084 (0.503)	1.022 (0.471)	1.072 (0.509)	1.207 (0.579)
Family Business	1.303 (0.814)	1.425 (0.909)	1.617 (1.046)	1.507 (0.937)	1.461 (0.917)	1.635 (1.023)	1.437 (0.894)	1.415 (0.841)
Gender	0.923 (0.647)	0.906 (0.642)	0.832 (0.600)	1.015 (0.713)	0.909 (0.634)	1.009 (0.709)	1.025 (0.720)	0.997 (0.689)
Age of Owner-Manager	0.773 (1.164)	1.197 (0.871)	1.108 (0.728)	0.843 (0.836)	0.750 (0.884)	0.844 (0.807)	0.884 (0.886)	0.843 (0.890)
Relative Role Model	<b>0.255</b> <b>(0.211)<sup>c</sup></b>	<b>0.245</b> <b>(0.181)<sup>c</sup></b>	<b>0.210</b> <b>(0.179)<sup>c</sup></b>	<b>0.235</b> <b>(0.196)<sup>c</sup></b>	<b>0.240</b> <b>(0.200)<sup>c</sup></b>	<b>0.226</b> <b>(0.190)<sup>c</sup></b>	<b>0.225</b> <b>(0.188)<sup>c</sup></b>	<b>0.277</b> <b>(0.188)<sup>c</sup></b>
Limited Liability	0.821 (0.551)	0.977 (0.685)	0.865 (0.601)	0.760 (0.517)	0.858 (0.585)	0.908 (0.607)	0.776 (0.535)	0.800 (0.609)
Partnership	1.424 (1.007)	1.762 (0.314)	2.032 (0.527)	1.448 (0.532)	1.635 (0.534)	1.538 (0.514)	1.456 (0.505)	1.399 (0.511)
Degree	1.215 (0.763)	1.270 (0.825)	1.153 (0.736)	1.344 (0.841)	1.056 (0.669)	1.178 (0.744)	1.365 (0.837)	1.214 (0.829)
Exporter	0.531 (0.395)	0.547 (0.416)	0.622 (0.464)	0.533 (0.390)	0.515 (0.309)	0.470 (0.354)	0.478 (0.354)	0.559 (0.305)
Innovator Product	<b>3.295</b> <b>(0.563)<sup>a</sup></b>	-----	-----	-----	-----	-----	-----	-----
Innovator Process	-----	<b>5.987</b> <b>(0.103)<sup>a</sup></b>	-----	-----	-----	-----	-----	-----
Innovator Work	-----	-----	<b>15.551</b> <b>(0.359)<sup>a</sup></b>	-----	-----	-----	-----	-----
Innovator Supply	-----	-----	-----	<b>2.568</b> <b>(0.543)<sup>a</sup></b>	-----	-----	-----	-----
Innovator Markets	-----	-----	-----	-----	<b>8.517</b> <b>(0.093)<sup>b</sup></b>	-----	-----	-----
Innovator Administration	-----	-----	-----	-----	-----	<b>5.085</b> <b>(0.544)<sup>b</sup></b>	-----	-----
Innovator Distribution	-----	-----	-----	-----	-----	-----	<b>2.706</b> <b>(0.589)<sup>b</sup></b>	-----
R&D (1-2%)	-----	-----	-----	-----	-----	-----	-----	1.041 (0.941)
R&D (3-5%)	-----	-----	-----	-----	-----	-----	-----	1.211 (0.922)
R&D (6-10%)	-----	-----	-----	-----	-----	-----	-----	2.231 (0.991)
R&D (11-20%)	-----	-----	-----	-----	-----	-----	-----	3.001 (0.916)
R&D (≥21%)	-----	-----	-----	-----	-----	-----	-----	3.911 (1.011)
Log likelihood	-156.02	-152.64	-150.84	-155.54	-153.52	-153.58	-155.32	-150.95
Pseudo R <sup>2</sup>	0.120	0.182	0.214	0.127	0.172	0.167	0.134	0.209

## 6.5.2 Discussion and implications

### Key findings

#### *The use of own funds at start-up*

The bivariate results suggested that with regard to the 8 measures of innovation, 3 of these were statistically significantly related to the use of own funds at start-up. Product innovators and distribution innovators were positively statistically significantly related at the 0.05 level to the use of own funds at start-up. The expenditure on R&D dummy variables relating to high levels of expenditure 11-20% and  $\geq 21\%$  were both statistically significant by way of comparison with the excluded dummy variable of no expenditure on R&D. These dummy variables were both statistically significant at the 0.01 level. The multivariate regression results with regard to innovation were consistent with the bivariate results, although none of the dummy variables of R&D expenditure were statistically significant.

Thus, there is mixed support for the first hypothesis that innovators are more likely to use their own savings at start-up in comparison to their non-innovating counterparts. Access to finance has a major role in the growth as well as the development of entrepreneurs' businesses (Black and Strahan, 2002). At a practical level, a lack of capital may hinder the day-to-day activities of businesses, perhaps preventing the maintenance or the replacement of older, inefficient machinery and equipment or delaying and preventing the procurement of raw materials which are needed to grow the businesses (Van Auken, 2001; Pissarides, 1999). The innovating firms, thus, are more likely to have to use their own funds which, depending upon individual circumstances, may not comprise substantial resources. This may in turn hinder the establishment and then the subsequent growth of the business.

Innovating firms are more likely than non-innovating businesses to be engaging in risky activities for which there is a greater possibility of the business encountering difficulties and the business ending, where there is, by virtue of the nature of the innovation related expenditures, little possibility of recouping such investment.

#### *The use of partners' funds at start-up*

The initial analysis of the cross-tabulations indicated that 4 types of innovation – work, markets, administration and R&D expenditure were statistically significant at the 0.05 level or better related to the use of partners' funds at start-up. The multivariate regression analysis found that two measures of innovation were statistically significant at the 0.05 level – markets and administration innovation. Thus, the inclusion of the control variables rendered the relationship between work innovation and R&D expenditure and the use of partners' funds at start-up not statistically significant. Thus, the results provide mixed support for the second hypothesis with regard to the use of partners' funds at start-up.

#### *The use of ordinary shares at start-up*

Three types of innovation – process, distribution and R&D expenditure - were statistically significantly related at the 0.05 level to the use of ordinary shares at start-up in both the bivariate and the multivariate regression analysis. However, as with the findings on partners' funds at start-up in the regression analysis, none of the R&D dummy variables were statistically significant at the 0.01 level or better.

#### *The use of family contributions at start-up*

The bivariate and the multivariate regression confirmed that supply, administration and R&D expenditure were statistically related to the use of family contributions at start-up at the 0.05 level, or better. As with the findings on the use of ordinary shares and partners' funds at start-up not all of the R&D dummy variables were statistically significant.

#### *The use of bank loans and overdrafts at start-up*

The greatest number of innovation variables which were statistically significantly related to a source of start-up finance was found with regard to the use of bank loans and overdrafts. All seven of

the output measures of innovation related to the use of bank loans and overdrafts were statistically significant at the 0.05 level, or better.

Thus, overall there are results which provide mixed support for hypotheses H1 and H2. A number of reasons account for these results. For many small businesses, especially at the start-up stage, access to finance is a major challenge and they often fund their innovative ideas by resorting to their own savings, as well as the retained earnings of the businesses once they are up and running. Secondly, because in the majority of small businesses there is either a single person or a very small management team, by definition the majority of the innovative ideas are only with the entrepreneur. If any misfortune happened to the entrepreneur then that could also be terminal for the business. Consequently, potential backers are less likely to be receptive to such funding requests from small innovating businesses, and thus the innovating businesses seek finance from other sources, and thus have a higher probability of applying for external finance from a variety of sources compared to their non-innovating counterparts. Thirdly, in Beijing, and indeed throughout China, the system of property rights and the legal system do not offer protection to the lenders of finance to small businesses. There is a long history in China of borrowers absconding and defaulting upon loan finance, and/or of misappropriating the finance and assets of a business. Moreover, the legal system in China is very slow and cumbersome, which renders the recovery of loans extremely difficult; indeed an absconding business person could go to ground in another city away from Beijing, in what is a country covering a huge land mass (Zhu, 2002; Zhou and Zheng, 2004). In the face of the difficulty in enforcing contracts this does result in the high-risk types of businesses, such as innovators, being more likely to apply for external finance.

The results presented in this chapter serve to confirm the pecking order theory of small business finance in Beijing. The theory suggests that entrepreneurs will have a preference for utilising own savings rather than taking on debt, a preference for debt finance rather than external equity finance (Giudici and Paleari, 2000; Swinnen et al., 2005). This is explained by the argument that self financing from own savings is not as costly as external sources of finance, combined with the fact that the entrepreneur has more knowledge of the innovations taking place in their products or services

compared to the less informed external potential providers of finance. However, debt finance in comparison to external equity is not as costly, and will allow the entrepreneur to continue to run the business without a dilution of ownership and an absence of a perceived interference from the providers of the external equity.

The comparatively new re-establishment of property rights has made the sense of ownership so strong that small business owner-managers consider their ventures as their siblings rather than business entities. Traditionally in China there is a particular reluctance and unwillingness embedded in owners' minds to make recourse to external equity providers, due to fears of losing their say in the business, and to protect the locus of control over their properties. Moreover, there are substantial costs and great difficulties in pursuing access to external equity and this is especially the case for innovative small businesses. In an environment where there is a lack of protection for intellectual property rights, innovative ideas could easily be copied leaving innovators with an incredibly short span of time to recoup the cost involved in inventive projects before a profit can be realised. Apparently, innovative SMEs are the most financially vulnerable among all innovators in this super competitive marketplace. As a result, it is a highly technical and subjective task to estimate the value of an innovative small business, which in turn could end up creating a dispute between the owner-manager and the equity provider in terms of the proportion of the stake in exchange for the amount of finance. Rather than seeking external equity providers, the small business community members would instead be more likely to take on board individual investors and make them a partner in the business. The partnership relationship is also more likely to be pursued compared to the institutional investor external equity route because the partner would be more likely to bring skills, knowledge and experience which will then be at the disposal of the incumbent entrepreneur and the existing team. More importantly, the enhancement of the social capital (Guanxi network) by introducing a strong business partner is very attractive to the entrepreneur and, in most cases, will affect the financial outcomes of the investment project, in addition to the direct money injection from this new partner (Park and Luo, 2001). And so,

such a route is more often perceived by Chinese business people to involve less interference and to bond or tie the partner to the business and the common goal of making profits.

The cross-tabulations and also the regression analysis found that several of the control variables were also found to be important and have strong relationships with the use of start-up finance. Exporting businesses were found to be more likely than non-exporting businesses to have used own funds, partners, ordinary shares and family contributions. Exporting also represents a specific form of human capital. Depending upon the views of a potential provider of finance they are more likely to perceive exporting firms as a slightly less insecure potential borrower than an innovating business, but still a high risk business. The exporters have a better knowledge of their exports as well as the external business environment where they sell goods and services compared to the lenders of finance, and this asymmetric information is problematic. This can restrict entrepreneurs' access to finance (Binks et al., 1992).

It is difficult enough for business people in Beijing to make customers provide payment quickly and within one month of receipt of the goods (Tan, 2006). However, exporting businesses whilst enjoying the benefit of increased production and increased growth possibilities, also expose the exporting businesses to potential cash-flow problems and difficulties. Payment from the customers in the importing countries can be a lot slower than domestic payments. Such customers can cite a need to check the quality of the products received, and this has increased more recently in the wake of various scandals about the quality of Chinese manufactured goods and food products (Bapuji and Beamish, 2007; Lu, 2008). A delay of between 30-90 days to check the quality and consistency of the products and services can thus occur (Buatsi, 2002). Unfortunately, the need to check the quality may be combined with communication problems and other difficulties, as well as some customers wanting to see what they can get away with in delaying payment, and this can all result in late or uncertain payments.

Sector had comparatively little systematic relationships with the use of start-up finance. Indeed manufacturing businesses were more likely than service sector businesses to have used family

contributions at start-up. Whilst the age of the business was not statistically significant in any of the regression models, family businesses were more likely to use their own funds and family contributions, and less likely to use partners' finance and ordinary shares. Family ties are at the core of the concentric circles of Chinese people's connections and they are particularly useful to younger firms (Zhu and Warner, 2000). At start-up stage of the business, contributions from family and friends are cheap and in most cases free to the entrepreneur. In Chinese culture, the older generation almost feels obliged to help younger family members to start a new career and generally are not looking for a return in money terms from the loan (Lee, 1996; Basu and Parker, 2001). It is also worth noting that the information asymmetry problem is much less profound in the setting of asking for loans from close relatives (Casson, 2003).

The size of the firm was not statistically significant in any of the regression models with the sole exception of bank loans and overdrafts. Larger sized businesses were more likely to use bank loans and overdrafts at start-up than smaller sized businesses. The general lack of a statistically significant relationship between size and sources of finance is interesting and is in contrast to other studies of developed and developing nations where size was found to be important (Blanc, 1997; Steel and Webster, 1991; Aryeetey et al., 1994).

The gender of the entrepreneur was not found to be related to the use of sources of finance at start-up in any of the models. The business community in Beijing has a long history of women being involved in running businesses, and with the re-emergence of private enterprises women have been active from the beginning. Whilst some studies of developed nations and emerging nations have found that women encounter difficulties in accessing start-up finance (Verheul and Thurik, 2001; Robson and Obeng, 2008) the women in Beijing appear to be no less disadvantaged than their male counterparts.

The age of the entrepreneurs was not statistically related to any of the models of start-up finance. Thus, in Beijing when the data is analysed in a multivariate context the young entrepreneurs in Beijing are not more likely (or less likely) to use specific sources of finance compared to middle aged or older entrepreneurs. This set of results is interesting and contrasts with previous research in developing and

developed nations where younger entrepreneurs because of a lack of a track record can be rendered less able to secure external finance at start-up compared to older entrepreneurs with a business history (Robb and Wolken, 2002; Timmons, 1994), and a greater extent of assets which can be utilised as collateral (Hall et al., 2004). In such circumstances, the previous research has found that younger entrepreneurs were then more likely to use their own savings at start-up (Robb and Wolken, 2002; Timmons, 1994).

Having a relative model was found to be positively related to the use of family contributions but negatively related to the use of bank loans and overdrafts. Previous research by Curran and Blackburn (1993) and Bates (1997) noted that family borrowings at start-up was prevalent among businesses owned by ethnic minorities in the UK, and amongst Asian immigrant entrepreneurs in the US. Given the strong ties within the Beijing business community, it is not entirely surprising that those businesses which had relative role models were more likely to use family contributions.

## **6.6 Conclusion**

In this, the first of three empirical chapters, the researcher has explored the sources of start-up finance of small businesses in Beijing, using a new bespoke survey. The research focussed upon testing two hypotheses. The findings suggest that entrepreneurs with innovating businesses are more likely to use both internal sources of finance and external sources of finance than entrepreneurs with non-innovating businesses. These findings were not uniformly consistent with regard to the type or facet of innovation against the sources of start-up finance, but the results did show that innovation was an important factor. This notwithstanding, other human capital elements of the entrepreneurs and their businesses were found to be important, as well as other control characteristics relating to the business and the entrepreneurs.

Own funds have been found to be the most important source of start-up finance, used by 87.83% of entrepreneurs, and representing on average 60.5% of start-up finance. Besides own savings, the research has also found that 30.09% and 29.42% of entrepreneurs used ordinary shares and partners

as sources of start-up finance, respectively. Correspondingly, these two sources of start up finance on average accounted for 17.70% and 12.76% of start-up finance.

Family contributions were used by 14.60% of entrepreneurs and this source represented on average 6.08% of start-up finance, whilst bank loans and overdrafts, as well as trade credit, were used by comparatively few entrepreneurs and contributed only small amounts to start-up finance.

More specifically, the results were supportive of hypothesis H1 that entrepreneurs engaged in innovation are more likely to report a higher usage of their own savings as a source of finance at start-up compared with entrepreneurs not engaged in innovation. There was also support for the hypothesis H2 that entrepreneurs engaged in innovation were more likely to report a higher level of usage of external sources of finance at start-up compared with entrepreneurs not engaged in innovation. In the overall conclusion chapter the researcher returns to address and develop the implications of the findings of this chapter, individually, and in conjunction with the findings from the other two chapters.

In the following chapter the research moves to exploring and testing three hypotheses on: the percentage of money received from that source, the amount of money sought, and the amount of money received. As with this chapter, in the next chapter human capital theory and, in particular, the specific form of human capital pertaining to innovation are again the centre of attention. The following chapter will be concerned with businesses which have sought finance, rather than the full sample including those who have and have not sought finance. It will be the final econometric chapter in which the analysis looks at the characteristics of firms seeking finance.

## **Chapter 7:**

### **Applications and Success in Accessing Finance and Awareness of Sources of Finance**

#### **7.1 Introduction**

The objective of this chapter is to investigate the funding environment for innovative and non-innovative small enterprises in the Beijing area of China. Calls have been made for more studies of small firms in developing countries (Naudé, 2010), and especially China (Li et al., 2008). There have been studies of entrepreneurs and small business in Beijing (See Wright et al. 2008; Dai and Liu, 2009) particularly centred upon returnee entrepreneurs, but studies of finance and innovation are less common. Moreover whilst the benefits of innovation for economic growth are rarely understated, it is commonly thought that ‘...a strict reliance on a market system will result in underinvestment in innovation, relative to the socially desirable level’ (Martin and Scott, 2000, p. 438). Innovation projects are by their very nature speculative, requiring resource commitments in advance of anticipated revenues. In addition, this implied risk is compounded by a number of related factors: limited scrap and resale value of innovation ‘assets’; unresolved technical and target (or market) uncertainties; and, appropriation concerns (see, for instance, Tylecote, 1994; Symeonidis, 1996; Baldwin *et al.*, 2002). Assuming that firms exploit innovations through their own output, small firms are likely to be at a particular disadvantage. In many instances, the ability of expected sales to meet initial costs is marginal at best (Cohen, 1995). Additionally, whilst large firms may build portfolios of innovation projects, diversifying to obtain more stable cash flows and reduce risks (Giudici and Paleari, 2000), small firms are, more often, constrained to

develop single (or a small number of) research projects that require considerable funding relative to turnover base. In short, investment in innovation is risky and, all other things being equal, risks are greater for smaller firms. The primary consequence is that ‘...there is bound to be some discrimination against investment in inventive and research activities’ (Arrow, 1971, p. 153). Recent empirical work has shown such discrimination to be most marked in the small firm sector (e.g. Freel, 2007).

In light of these observations, most developed economies have advanced a pot-pourri of policy instruments to ameliorate the financial constraints apparently faced by small firms generally and innovative small firms specifically<sup>5</sup>. Many of these have been the subject of academic evaluation (e.g. Audretsch *et al.*, 2002; North *et al.*, 2001), while many more studies have explored, broadly, the funding concerns of innovative small firms (e.g. Freel, 1999; Giudici and Paleari, 2000; Oakey, 2003; Mueller and Zimmermann, 2009). However, whilst studies of the financing of smaller enterprises in developed economies are widespread (if disappointingly inconclusive), studies in developing economies are far less common. This is consistent with Bruton *et al.*'s (2008) lament on the relative dearth of research into entrepreneurship in emerging economies, such as China. China's recent startling growth (and, in particular, the growth of core Eastern cities) throws this lacuna into sharper relief. Whilst there is evidence of a growing interest in high-technology industry development (Ning, 2007) and measurable developments in the Chinese venture capital industry, there has been limited primary research directly addressing the funding activities and aspirations of innovative ventures.

Drawing upon data provided by 452 respondents to a postal survey administered between July and December 2007, this paper begins filling the gap. An

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<sup>5</sup> Examples of innovation specific programmes include: the SBIR program in the United States; the SMART award scheme in the UK; elements of the NRC-IRAP programme in Canada.

earlier version of the chapter was presented at the 2008 Babson conference (Robson et al., 2008b). This paper has been subsequently revised and developed and is currently under consideration by the *Journal of Small Business and Enterprise Development*. In this chapter, hypotheses H3, H4 and H5 are tested, and the reader is reminded of these hypotheses below:

*H3:* Innovative ventures will possess a greater likelihood of having applied for external funding compared to non-innovating ventures.

*H4:* Innovative ventures will possess a greater likelihood of having been refused access to external finance compared to non-innovating ventures.

*H5:* The non-innovative ventures are less likely to be aware of the availability of, and to complete applications for, risk capital compared to innovators.

The chapter is structured as follows. Section 2 details the overall levels of applications for external finance – by source, and bivariate analysis against the characteristics of the firms and the entrepreneurs. Section 3 looks at whether the firms were successful in their applications for external finance – by source, and then develops bivariate analysis against innovation, and the firm's and owner-manager's characteristics. Section 4 applies a similar approach to sections 2 and 3 but with regard to the levels of awareness of external sources of finance. Thereafter the chapter looks at regression analysis on applications for external finance, being successful in these applications, and then the awareness of sources of finance, by source. Finally, concluding remarks are outlined to complete the chapter.

## **7.2 Empirical Findings**

### **Applications for external finance**

The percentage of the entrepreneurs applying for each of the external sources of finance is shown in the first row across Table 7.1, 7.2 and 7.3. It shows that 14.85% of firms applied for bank overdrafts, 41.15% of firms applied for long-term bank finance, and 57.96% of firms applied for short-term bank finance. In the case of banking sources of finance, the relatively greater importance of short-term bank finance compared to bank overdrafts can be explained by the fact that the bank overdrafts are still a relatively new type of financial product or source of finance in China. Following initiatives from the People's Bank of China (the Chinese central bank) and clearer instructions concerning the clearing process, commercial banks in China recently launched a range of new financial products in order to overcome the obstacles to financing brought about by difficulties with overdraft facilities experienced by SMEs since 2008.

Partners and working shareholders were popular sources to apply to for finance. Slightly more than two out of five firms (43.14%) applied for finance from partners and working shareholders. Given the close relationship of partners and working shareholders with their firms, it is natural that firms should turn to them to source external finance. It would be expected that the partners and working shareholders would look favourably upon requests for finance, and offer this backing at favourable rates – especially compared to banks and other sources of finance.

Three sources of finance applied to by less than one in five of the firms were factoring and invoice discounting firms, equity, and grants. More specifically, 16.81% of firms applied to factoring and invoice discounting firms, 17.92% applied to equity sources, and 9.73% of firms applied for grants. Each of these three sources of

finance is still comparatively new and under-developed in China. Factoring and invoice discounting firms are still scarce on the ground in Beijing, and Chinese firms may feel that the divulging of information to third parties is also too high a price to pay for extra finance. Also, as indicated in the front-end chapters of the dissertation, the provision of equity finance is not very good in China. There remains, moreover, a great deal of scepticism about utilising equity finance and also a fear of losing control of the business, or at the least having to divulge information and allow external sources to have a say in the strategy and/or the day-to-day running of the business. Grants, too, are still a comparatively new phenomenon in China. The Chinese government has set up funding institutions focusing on the needs of various groups, for instance the establishment of the InnoFund (Innovation Fund for Small Technology-based Firms) by the State Council in 1999, to help small innovative firms overcome the start-up capital barrier and to foster innovative research activities. Grants are offered both to research personnel who have a track record of scientific achievements and to businesses to subsidise new product developments. Temporary grants or subsidies are made available in special circumstances, i.e. local governments' support during a financial crisis to compensate firms for not making any redundancies.

### **7.2.1 Crosstabulation analysis**

The reader is reminded that hypothesis H3 revolved around the notion that innovators would possess a significantly greater likelihood of having applied for external finance in comparison to the non-innovative businesses. Table 7.1 presents the proportion of firms applying for external finance, against their innovation activity and the control variables relating to the entrepreneurs and the firms.

Innovation activity is captured by the same eight measures that were utilised in the previous chapter. Storey (1994 pp.194) holds that “innovation (is) associated with more rapid growth within small firms”. Innovation has an undeniable impact upon the two performance parameters, namely a firm’s profitability and a firm’s growth. Innovators appear to experience superior performance when compared to their less innovative peers. According to the the Ministry of Science and Technology of China, more than 65% of patents filed since 1990 have been by SMEs, and so it is logical to infer that SMEs are responsible for the majority of technological innovation in the country. However, innovative small enterprises often lack the means to develop, by being, in particular, financially constrained, thus access to capital is desperately required to facilitate innovative and commercially appealing projects from their early stages of development.

*Bank overdraft, short-term and long-term bank loans*

The results in Table 7.1 show that innovation was strongly statistically significantly at the 0.10 level, or better, related to the applications for the three types of bank finance. Bank overdrafts were applied for by 20.35% of process innovators compared to 11.43% of non-process innovators and this was statistically significant at the 0.05 level. There was a stronger statistical significance at the 0.01 level between process innovation and long-term bank finance with 51.16% of process innovators and 35.00% of non-process innovators applying for this.

Overdrafts from the bank were sought by 18.23% of work innovators and 12.05% of non-work innovators and this was statistically significant at the 0.10 level. Furthermore, 53.20% of work innovators and 31.33% of the non-work innovators applied for long-term bank finance, and this relationship was highly statistically significant at the 0.01 level.

Supply innovators applied in greater numbers than non-supply innovators for all three measures of bank finance and the relationships were statistically significant at the 0.10 level, or better. Market innovators reported higher levels of applications for short-term bank finance than non-market innovators and this relationship was weakly statistically significant at the 0.10 level, but market innovation was not related to the applications for bank overdrafts or long-term bank finance.

Admin innovation was statistically significantly related at the 0.05 level to the applications for both overdrafts and long-term bank finance. Bank overdrafts were sought by 19.21% of admin innovators compared to 12.00% of non-innovators, while 46.89% of admin innovators and 37.45% of non-innovators applied for long-term bank finance.

Interestingly, product innovation was related at the 0.01 level of significance to longer term bank finance. Product innovators (44.7%) and non-product innovators (31.09%) applied for long-term bank finance. However, product innovation was not statistically significantly related at the 0.10 level, or better, to the other two sources of bank finance.

Distribution innovation was highly statistically significant at the 0.01 level related to the applications for both bank overdrafts and long-term bank finance, and weakly at the 0.10 level related to applications for short-term bank finance. In all three cases more distribution innovators than non-innovators applied for finance from the bank.

R&D expenditure was weakly statistically significant at the 0.10 level to each of the three bank related sources of external finance. Firms spending larger amounts of resources on R&D and captured by the three dummy variables of 6-10%, 11-20% and  $\geq 21\%$  reported higher numbers of applications for bank overdrafts compared to those spending lower amounts on R&D and falling into the groups 0%, 1-2% and 3-5%. In the case of short-term bank finance, 31.67% of firms who spent no money on R&D applied for short-term bank finance and this was roughly half the level of applications for each of the other categories of firms who spent money on R&D.

A similar, but stronger pattern was found for R&D expenditure and applications for long-term bank finance. This was most striking with only 23.3% of firms who did not spend money on R&D applying for long-term bank finance which was less than one third of the 76.47% of firms who spent  $\geq 21\%$  of their turnover on R&D.

Thus, the evidence presented in Table 7.1 indicates that innovating firms having applied in greater numbers than their non-innovating counterparts for bank finance, and this evidence is supportive of hypothesis H3.

**Table 7.1: Descriptive statistics – applications for external finance by source**

	Bank's Overdraft	$\chi^2$	Bank Loan ( $\geq 2$ years)	$\chi^2$	Bank Loan (< 2 years)	$\chi^2$	n
<b>All</b>	14.82		41.15		57.96		452
Manufacturing	14.94	0.007	42.91	0.791	60.92	2.213	261
Services	14.66		38.74		53.93		191
8-19 employees	<b>15.56</b>	<b>8.427<sup>c</sup></b>	<b>29.44</b>	<b>18.946<sup>a</sup></b>	<b>48.89</b>	<b>14.021<sup>a</sup></b>	180
20-49 employees	<b>11.72</b>		<b>46.88</b>		<b>64.06</b>		128
50-99 employees	<b>10.26</b>		<b>47.44</b>		<b>56.41</b>		78
100-199 employees	<b>20.00</b>		<b>50.00</b>		<b>72.50</b>		40
200-499 employees	<b>30.77</b>		<b>61.54</b>		<b>73.08</b>		26
1-5 years old	<b>10.67</b>	<b>6.018<sup>b</sup></b>	<b>34.27</b>	<b>6.666<sup>b</sup></b>	60.11	0.639	178
6-9 years old	<b>19.77</b>		<b>43.50</b>		55.93		177
$\geq 10$ years old	<b>13.40</b>		<b>49.48</b>		57.73		97
Family Business	<b>12.50</b>	<b>6.768<sup>b</sup></b>	42.13	0.164	58.80	0.117	216
Non Family Business	<b>16.95</b>		40.25		57.20		236
Male	14.01	0.890	40.06	0.840	57.70	0.048	357
Female	17.89		45.26		58.95		95
18-30 years old	<b>27.66</b>	<b>9.212<sup>b</sup></b>	<b>57.45</b>	<b>7.503<sup>c</sup></b>	<b>65.96</b>	<b>7.513<sup>c</sup></b>	47
31-45 years old	<b>13.33</b>		<b>40.00</b>		<b>56.49</b>		285
46-55 years old	<b>15.96</b>		<b>40.43</b>		<b>57.45</b>		94
$\geq 56$ years old	<b>3.85</b>		<b>26.92</b>		<b>61.54</b>		26
Relative Role Model	13.17	0.571	44.31	1.093	<b>64.07</b>	<b>4.054<sup>b</sup></b>	167
No Relative Role Model	15.79		39.30		<b>54.39</b>		285
Registered Business	<b>17.65</b>	<b>5.566<sup>c</sup></b>	<b>38.24</b>	<b>5.535<sup>c</sup></b>	<b>56.37</b>	<b>5.599<sup>c</sup></b>	204
Partnership	<b>11.65</b>		<b>35.92</b>		<b>65.05</b>		103
Limited liability	<b>13.10</b>		<b>48.97</b>		<b>55.17</b>		145
Degree	15.79	0.288	43.06	0.587	58.85	0.126	209
No Degree	13.99		39.51		57.20		243
Exporter	15.32	0.028	45.95	1.397	<b>76.58</b>	<b>20.918<sup>a</sup></b>	111
Non-Exporter	14.66		39.59		<b>51.91</b>		341
Innovator – Product	13.45	0.243	<b>44.74</b>	<b>6.748<sup>a</sup></b>	60.06	2.279	333
None	15.32		<b>31.09</b>		52.10		119
Innovator – Process	<b>20.35</b>	<b>6.715<sup>b</sup></b>	<b>51.16</b>	<b>11.494<sup>a</sup></b>	57.56	0.019	172
None	<b>11.43</b>		<b>35.00</b>		58.21		260
Innovator – Work	<b>18.23</b>	<b>3.38<sup>c</sup></b>	<b>53.20</b>	<b>22.100<sup>a</sup></b>	55.67	0.800	203
None	<b>12.05</b>		<b>31.33</b>		59.84		249
Innovator – Supply	<b>20.56</b>	<b>7.785<sup>a</sup></b>	<b>58.89</b>	<b>38.865<sup>a</sup></b>	<b>63.33</b>	<b>3.538<sup>c</sup></b>	180
None	<b>11.03</b>		<b>29.41</b>		<b>54.41</b>		272
Innovator – Markets	15.93	0.646	44.07	2.367	<b>61.11</b>	<b>2.725<sup>c</sup></b>	270
None	13.19		36.81		<b>53.30</b>		182
Innovator – Admin	<b>19.21</b>	<b>4.433<sup>b</sup></b>	<b>46.89</b>	<b>3.961<sup>b</sup></b>	58.19	0.006	177
None	<b>12.00</b>		<b>37.45</b>		57.82		275
Innovator – Distribution	<b>21.20</b>	<b>9.982<sup>a</sup></b>	<b>54.35</b>	<b>22.319<sup>a</sup></b>	<b>63.30</b>	<b>3.405<sup>c</sup></b>	184
None	<b>10.45</b>		<b>32.09</b>		<b>54.65</b>		268
R&D Expenditure as a % of turnover: None	<b>15.00</b>	<b>9.886<sup>c</sup></b>	<b>23.33</b>	<b>9.999<sup>c</sup></b>	<b>31.67</b>	<b>9.908<sup>c</sup></b>	60
1-2%	<b>12.18</b>		<b>39.74</b>		<b>66.03</b>		156
3-5%	<b>11.02</b>		<b>41.53</b>		<b>62.71</b>		118
6-10%	<b>20.29</b>		<b>49.28</b>		<b>52.17</b>		69
11-20%	<b>18.75</b>		<b>43.75</b>		<b>65.62</b>		32
$\geq 21\%$	<b>35.29</b>		<b>76.47</b>		<b>52.94</b>		17

n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

Many of the control variables were also statistically significantly related to the applications for one of the three types of bank finance. Larger sized firms applied in greater numbers for all three types of finance and these relationships were statistically significant at the 0.01 level for short-term and long-term bank finance, and weakly statistically significant at the 0.1 level with regard to bank overdrafts. Younger firms, established for 1-5 years of applied for bank overdrafts and long-term bank finance in substantially fewer numbers than older firms and both of these relationships were statistically significant at the 0.05 level. Older entrepreneurs of  $\geq 56$  years of age applied in smaller numbers for bank overdrafts (3.85%), and long-term bank finance (26.92%), than the younger age groups of entrepreneurs and these relationships were statistically significant at the 0.05 and 0.10 level, respectively.

Greater numbers of registered businesses (17.65%) compared to partnerships (11.65%) and limited liability firms (13.10%) applied for bank overdrafts. Substantially more limited liability firms (48.97%) applied for long-term bank finance than did registered businesses (38.24%), and partnerships (35.92%). For the type of business variable, this was weakly statistically significant at the 0.10 level for both of the aforementioned sets of results.

Over three quarters of exporting firms (76.58%) applied for short-term bank finance compared to just over half of non-exporting firms (51.91%) and this relationship was highly statistically significant at the 0.01 level.

### *Equity finance*

The results in Table 7.2 show that innovation was strongly statistically significant at the 0.10 level, or better, relating to the applications for equity finance. Indeed all seven output measures of innovation and also the input measure of innovation – R&D expenditure - were statistically significant at the 0.10 level, or better.

Almost three times as many product innovators (21.62%) as non-product innovators (7.56%) applied for equity finance. This type of financial support was also applied for by 24.14% of work and 12.85% of non-work innovators, by 22.96% of market innovators and 10.44% of non-market innovators and by 27.12% of admin innovators and 12.00% of non-admin innovators. In each case, the relationship was statistically significant at the 0.01 level. The three other input measures of innovation – process, supply, and distribution - were weakly statistically significant at the 0.10 level, and there was less than 10% difference in seeking equity finance between innovators and non-innovators. The input measure of innovation, R&D expenditure, was also weakly statistically significant at the 10% level; 6.67% of firms with no spending on R&D applied for equity finance which was much lower than the 15.38% of applications by those firms spending 1-2% of turnover on R&D. This, in turn, was lower than the 19.49% found in firms spending 3-5% on R&D. The highest reported applications for equity finance were by firms spending  $\geq 21\%$  of their turnover on R&D, which totalled 64.17%.

Thus, the bivariate analysis shows that innovating firms are applying for equity finance in greater numbers than non-innovating firms and this evidence is highly supportive of hypothesis H3.

Four control variables were also found to be statistically significantly related to applications for equity finance. Entrepreneurs with degrees (21.53%) and exporters (23.42%) applied in greater numbers than those without degrees (14.81%) and non-exporters (16.13%), and both of these relationships were statistically significant at the 0.10 level. There was a clear correlation between the increased age of the entrepreneur and the declined applications for equity finance and this was highly statistically significant at the 0.01 level. A total of 38.30% of entrepreneurs aged 18-30 years made applications for equity finance and this was more than twice the number applying reported by those aged 31-45 years (17.89%). Applications for equity finance declined further to 11.70% of those entrepreneurs aged 46-55 years of age, and the lowest figures came from those entrepreneurs aged  $\geq 56$  years of age (3.85%). The gender of the entrepreneur was also highly statistically significant at the 0.01 level with regard to applications for equity finance, with 23.16% of women and 16.53% of men applying.

**Table 7.2: Descriptive statistics – applications for external finance by source**

	External Equity	$\chi^2$	Grants	$\chi^2$	Factoring/ Invoice Discounting	$\chi^2$	n
<b>All</b>	17.92		9.73		16.81		452
Manufacturing	17.24	0.194	<b>12.64</b>	<b>5.949<sup>b</sup></b>	17.60	0.290	261
Services	18.85		<b>5.76</b>		15.71		191
8-19 employees	14.44	7.434	<b>8.33</b>	<b>15.075<sup>a</sup></b>	<b>10.56</b>	<b>15.782<sup>a</sup></b>	180
20-49 employees	17.97		<b>7.03</b>		<b>17.19</b>		128
50-99 employees	21.79		<b>11.54</b>		<b>17.95</b>		78
100-199 employees	15.00		<b>7.50</b>		<b>32.50</b>		40
200-499 employees	34.62		<b>30.77</b>		<b>30.77</b>		26
1-5 years old	18.54	0.183	8.43	1.117	19.66	1.956	178
6-9 years old	18.08		9.60		14.12		177
≥10 years old	16.49		12.37		16.49		97
Family Business	15.74	1.336	<b>7.41</b>	<b>5.951<sup>b</sup></b>	15.74	0.341	216
Non Family Business	19.92		<b>11.86</b>		17.80		236
Male	<b>16.53</b>	<b>19.243<sup>a</sup></b>	9.24	0.466	16.53	0.100	357
Female	<b>23.16</b>		11.58		17.89		95
18-30 years old	<b>38.30</b>	<b>19.240<sup>a</sup></b>	<b>14.89</b>	<b>11.820<sup>b</sup></b>	<b>29.79</b>	<b>11.044<sup>b</sup></b>	47
31-45 years old	<b>17.89</b>		<b>7.72</b>		<b>17.89</b>		285
46-55 years old	<b>11.70</b>		<b>12.77</b>		<b>8.51</b>		94
≥56 years old	<b>3.85</b>		<b>11.54</b>		<b>11.54</b>		26
Relative Role Model	16.77	0.240	<b>10.78</b>	<b>3.422<sup>c</sup></b>	16.17	0.079	167
No Relative Role Model	18.60		<b>9.12</b>		17.19		285
Registered Business	18.14	0.071	8.82	1.831	<b>16.18</b>	<b>5.693<sup>c</sup></b>	204
Partnership	18.45		7.77		<b>10.68</b>		103
Limited liability	17.24		12.41		<b>22.07</b>		145
Degree	<b>21.53</b>	<b>3.336<sup>c</sup></b>	10.05	0.043	17.70	0.220	209
No Degree	<b>14.81</b>		9.47		16.05		243
Exporter	<b>23.42</b>	<b>3.029<sup>c</sup></b>	<b>13.51</b>	<b>3.112<sup>c</sup></b>	20.72	1.606	111
Non-Exporter	<b>16.13</b>		<b>8.50</b>		15.54		341
Innovator – Product	<b>21.62</b>	<b>11.780<sup>a</sup></b>	<b>12.61</b>	<b>11.923<sup>a</sup></b>	<b>19.82</b>	<b>8.169<sup>a</sup></b>	333
None	<b>7.56</b>		<b>1.68</b>		<b>8.40</b>		119
Innovator – Process	<b>25.00</b>	<b>9.462<sup>c</sup></b>	<b>17.44</b>	<b>18.771<sup>a</sup></b>	20.35	2.480	172
None	<b>13.57</b>		<b>5.00</b>		14.65		260
Innovator – Work	<b>24.14</b>	<b>9.685<sup>a</sup></b>	<b>14.29</b>	<b>8.687<sup>a</sup></b>	<b>21.18</b>	<b>5.027<sup>b</sup></b>	203
None	<b>12.85</b>		<b>6.02</b>		<b>13.25</b>		249
Innovator – Supply	<b>21.67</b>	<b>2.854<sup>c</sup></b>	<b>12.78</b>	<b>3.153<sup>c</sup></b>	<b>23.33</b>	<b>9.089<sup>a</sup></b>	180
None	<b>15.44</b>		<b>7.72</b>		<b>12.50</b>		272
Innovator – Markets	<b>22.96</b>	<b>11.592<sup>a</sup></b>	<b>11.85</b>	<b>3.421<sup>c</sup></b>	<b>20.00</b>	<b>4.866<sup>b</sup></b>	270
None	<b>10.44</b>		<b>6.59</b>		<b>12.09</b>		182
Innovator – Admin	<b>27.12</b>	<b>16.734<sup>a</sup></b>	12.43	2.405	<b>20.90</b>	<b>3.479<sup>c</sup></b>	177
None	<b>12.00</b>		8.00		<b>14.18</b>		275
Innovator – Distribution	<b>21.74</b>	<b>3.077<sup>c</sup></b>	<b>13.59</b>	<b>5.242<sup>b</sup></b>	<b>20.65</b>	<b>3.680<sup>c</sup></b>	184
None	<b>15.30</b>		<b>7.09</b>		<b>14.18</b>		268
R&D Expenditure as a % of turnover: None	<b>6.67</b>		<b>3.33</b>		<b>5.00</b>		60
1-2%	<b>15.38</b>	<b>10.999<sup>c</sup></b>	<b>7.69</b>	<b>11.233<sup>c</sup></b>	<b>17.31</b>	<b>10.800<sup>c</sup></b>	156
3-5%	<b>19.49</b>		<b>12.71</b>		<b>23.73</b>		118
6-10%	<b>18.84</b>		<b>11.59</b>		<b>17.39</b>		69
11-20%	<b>18.75</b>		<b>12.50</b>		<b>12.50</b>		32
≥21%	<b>64.71</b>		<b>17.65</b>		<b>11.76</b>		17

n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

*Grants, Factoring/ Invoice Discounting, and Partners and Working Shareholders*

The bivariate results in Table 7.2 and 7.3 showed consistently that the innovators applied for grants, factoring and invoice discounting firms, and partners in greater numbers than their non-innovating counterparts, and that these relationships were statistically significant at the 0.10 level or better. Indeed across the aforementioned three sources of finance, only two exceptions where the relationships were not statistically significant at the 0.10 level, or better, were firstly administration innovation and applications for grants, and secondly process innovation and factoring and invoice discounting firms.

Thus, the evidence in Tables 7.2 and 7.3 shows that with regard to grants, factor invoicing and discount firms, and firms with partners and working shareholders innovators generally applied in greater numbers than the non-innovating firms, and this evidence is supportive of hypothesis H3.

Several of the control variables were also statistically significant at the 0.10 level or better. Applications were made by 12.64% of manufacturing firms and 5.76% of service sector firms for grants, and 39.08% of manufacturing firms and 48.69% of service sector firms to partners for finance, and both of these relationships were statistically significant at the 0.05 level.

The size of firm was statistically significantly at the 0.01 level related to applications for factoring and invoice discounting firms, with 10.56% of firms with 8-19 employees reporting the lowest number of applications. This was approximately one third of the 32.50% of firms with 100-199 employees and the 30.77% of firms with 200-499 employees.

Applications to partners and working shareholders for finance were made by 50.85% of non-family businesses and that was much higher than the 34.72% reported by family businesses and this relationship was statistically significant at the 0.01 level.

The age of the entrepreneurs was statistically significantly at the 0.05 level or better related to applications to factoring and invoice discounting firms, to partners and working shareholders and for grants. In all three cases it was entrepreneurs of 18-30 years of age who applied for the sources in the greatest numbers compared to the older age groups.

The type of business was weakly statistically significant at the 0.10 level in the applications to factoring and invoice discounting firms, and to partners and working shareholders.

Entrepreneurs with degrees applied in greater numbers to partners and working shareholders compared to those without degrees and this relationship was statistically significant at the 0.01 level. Responses show that 49.76% of entrepreneurs with degrees compared to 37.45% of entrepreneurs without degrees applied to partners and working shareholders for finance. Possible explanations for these findings are firstly, entrepreneurs with university degrees or higher tend to be the younger generation of entrepreneurs, as education opportunities are much better for them compared to the generation of entrepreneurs who started their businesses in 1970s. The characteristics of younger owner-managers have become quite different from their older peers, as time has moved on. For instance, well-educated, young owner-managers will find themselves less bound to the traditional Chinese values and may not see being outright owners of their company as crucial as did the older generation, therefore they are more prepared to lose some control of the firm in exchange for resources. In addition, there is an increasing number of 'returnee

entrepreneurs' (Wright et al., 2008) who are very well educated and have an open mind about involving partners who can work with them to achieve business advancement. Thirdly, the introduction of business partners and / or working shareholders could effectively complement the entrepreneur by adding managerial skills, knowledge of the industry, social networking and financial resources.

Exporting showed a weakly positive statistical significance related to applications for grants, with 13.51% of exporters and 8.50% of non-exporters putting in grant applications. In spite of the prolonged period of Chinese trade surplus to the developed countries, Chinese exporting industries are highly clustered in low value-added manufacturing sectors that do not involve hiring skilled labour (i.e. product assembly for manufacture of electronic goods, mass production of soft toys, clothes and shoe making). Government policy has a clear tendency to promote innovation and grants that are released to the private sector are often for recognised inventive projects, whereas low skilled labour work does not warrant government support. Unfortunately, this is the hard reality Chinese exporters have to face. The profit margin for their sales is usually very low so that without the tax rebate the Chinese customs promises to pay after the goods are shipped overseas, they stand little chance of being in the money. Therefore, there are only going to be a small number of exporters who are aware and able to take advantage of the government financial support schemes.

**Table 7.3: Descriptive statistics – applications for external finance by source**

	Partners/ Working Shareholders	$\chi^2$	No External Applications	$\chi^2$	n
<b>All</b>	43.15		15.04		452
Manufacturing	<b>39.08</b>	<b>4.152<sup>b</sup></b>	14.18	0.364	261
Services	<b>48.69</b>		16.23		191
8-19 employees	42.22	1.714	<b>24.44</b>	<b>21.945<sup>a</sup></b>	180
20-49 employees	42.19		<b>10.16</b>		128
50-99 employees	48.72		<b>10.26</b>		78
100-199 employees	37.50		<b>5.00</b>		40
200-499 employees	46.15		<b>3.85</b>		26
1-5 years old	<b>51.12</b>	<b>7.718<sup>b</sup></b>	<b>13.48</b>	<b>7.887<sup>b</sup></b>	178
6-9 years old	<b>37.29</b>		<b>18.64</b>		177
≥10 years old	<b>39.18</b>		<b>11.34</b>		97
Family Business	<b>34.72</b>	<b>11.955<sup>a</sup></b>	17.59	2.102	216
Non Family Business	<b>50.85</b>		12.71		236
Male	43.14	0.144	15.97	1.130	357
Female	43.16		11.58		95
18-30 years old	<b>61.70</b>	<b>7.857<sup>b</sup></b>	<b>6.38</b>	<b>7.443<sup>c</sup></b>	47
31-45 years old	<b>42.11</b>		<b>13.68</b>		285
46-55 years old	<b>38.30</b>		<b>22.34</b>		94
≥56 years old	<b>38.46</b>		<b>19.23</b>		26
Relative Role Model	39.52	1.415	16.17	0.262	167
No Relative Role Model	45.26		14.39		285
Registered Business	<b>40.20</b>	<b>5.699<sup>c</sup></b>	<b>18.63</b>	<b>5.707<sup>c</sup></b>	204
Partnership	<b>47.57</b>		<b>14.56</b>		103
Limited liability	<b>44.14</b>		<b>10.34</b>		145
Degree	<b>49.76</b>	<b>6.943<sup>a</sup></b>	<b>9.57</b>	<b>9.117<sup>a</sup></b>	209
No Degree	<b>37.45</b>		<b>19.75</b>		243
Exporter	46.85	0.824	<b>3.60</b>	<b>15.067<sup>a</sup></b>	111
Non-Exporter	41.94		<b>18.77</b>		341
Innovator – Product	<b>44.74</b>	<b>6.991<sup>a</sup></b>	<b>10.81</b>	<b>17.736<sup>a</sup></b>	333
None	<b>38.66</b>		<b>26.89</b>		119
Innovator – Process	<b>56.40</b>	<b>19.884<sup>a</sup></b>	<b>9.30</b>	<b>7.163<sup>a</sup></b>	172
None	<b>35.00</b>		<b>18.57</b>		260
Innovator – Work	<b>54.68</b>	<b>20.058<sup>a</sup></b>	<b>8.37</b>	<b>12.826<sup>a</sup></b>	203
None	<b>33.73</b>		<b>20.48</b>		249
Innovator – Supply	<b>49.04</b>	<b>4.842<sup>b</sup></b>	<b>8.33</b>	<b>10.540<sup>a</sup></b>	180
None	<b>38.97</b>		<b>19.49</b>		272
Innovator – Markets	<b>50.00</b>	<b>12.858<sup>a</sup></b>	<b>10.37</b>	<b>11.466<sup>a</sup></b>	270
None	<b>32.97</b>		<b>21.98</b>		182
Innovator – Admin	<b>55.93</b>	<b>19.403<sup>a</sup></b>	<b>7.91</b>	<b>11.587<sup>a</sup></b>	177
None	<b>34.91</b>		<b>19.64</b>		275
Innovator – Distribution	<b>49.46</b>	<b>5.045<sup>b</sup></b>	<b>9.24</b>	<b>8.182<sup>a</sup></b>	184
None	<b>38.81</b>		<b>19.03</b>		268
R&D Expenditure as a % of turnover: None	<b>36.67</b>	<b>19.887<sup>a</sup></b>	<b>30.00</b>	<b>17.396<sup>a</sup></b>	60
1-2%	<b>42.31</b>		<b>14.10</b>		156
3-5%	<b>38.14</b>		<b>15.25</b>		118
6-10%	<b>50.72</b>		<b>13.04</b>		69
11-20%	<b>56.25</b>		<b>3.12</b>		32
≥21%	<b>52.94</b>		<b>0</b>		17

n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

### *No External Applications*

The last column of results shown in Table 7.3 deals with responses reporting no applications for finance. Fewer of the innovators made no applications for finance compared to the innovators and that these relationships were highly statistically significant at the 0.01 level for all output measures of innovation as well as the input measure of innovation, being R&D expenditure. In each case the percentage of innovators not applying for finance was more than double that of non-innovating firms. Thus, these results are consistent with the earlier findings on applications for each of the named sources of finance against innovation. This set of results is supportive of hypothesis H3.

Six of the control variables related to not applying for external finance were also found to be statistically significant at the 0.10 level or better and these were the size of the firm, the age of the firms, the age of the entrepreneur, the holding of a degree, the export activity, and the type of the business. More specifically, it was found that smaller firms compared to larger sized firms, the mid age firms aged 6-9 years; older entrepreneurs aged 46-55 and  $\geq 56$  compared to younger entrepreneurs were not applying for external finance in the greatest numbers. This situation also applied to those without degrees, non-exporting firms and registered businesses.

### **7.3 Success – Full or Reduced Amount Received**

In the results shown in Table 7.4, the percentage values relate to those entrepreneurs or firms who were successful and received either the full amount or a reduced amount of the finance which they were seeking from each source. Consequently the number of firms reported in each cell varies, as the research is only dealing with firms who applied to a source of finance.

The reader needs to be reminded that unfortunately information is not available upon the amount of external finance which was asked from each specific named source, nor how much was received specifically from each named source. In chapter 8, the researcher looks at the overall amount of finance which was requested, and the overall amount of finance which was received.

The information presented in Table 7.4, despite the above caveats, is very important and interesting in understanding the financing of SMEs in Beijing. No other similar study has presented this information from a large scale sample of SMEs in China, and has also had information on the characteristics of the businesses and the owner-managers. There are previous analyses from the Cambridge researchers, Alan Hughes and Andy Cosh, but their research looked at Britain.

The extent to which the firms received the full amount of external finance required varied hugely from source to source. Grants (6.82%), bank overdrafts (7.47%) and external equity (8.64%) were offered to the lowest proportions of firms receiving the full requested amount of external finance, and indeed was less than one in ten.

**Table 7.4: Successful applications for external finance of those applying, by source**

	Bank overdraft Model 9	Bank Loan ( $\cong$ 2 years) Model 10	Bank Loan (< 2 years) Model 11	External Equity Model 12	Grants Model 13	Factoring/ Invoice Discounting Firms Model 14	Partners/ Working shareholders Model 15
Full Amount	7.47	16.76	15.65	8.64	6.82	30.26	46.15
Reduced Amount	19.40	38.92	62.98	20.99	34.09	38.16	43.08
No Finance	73.13	44.62	21.37	70.37	49.09	31.58	10.77
Full or Reduced Amount	26.87	55.38	78.63	29.63	40.91	68.42	89.23
n	67	185	262	81	44	76	195

The n values are the number of entrepreneurs who applied to each named source of finance.

Long-term (16.76%) and short-term (15.65%) bank finance was provided to substantially greater proportions of firms receiving the full amount of finance sought. These results are disappointing and show the true picture of the extent of financial constraints SMEs have to suffer. Since banks represent the most ordinary formal source of finance, the awareness among business people of either long-term or short-term bank loans is high. Furthermore, in general, banks deal with the widest possible range of clientele in terms of money matters, therefore they are not only better equipped with risk assessment techniques, but also are in the position to help businesses in many situations when other financiers cannot. Whilst factoring or invoice discounting firms provided full funding to 30.26% of applicants, as far as this source of finance is concerned, an established business relationship (i.e. a number of previous dealings) with the factoring company is quite important and the money is almost certainly loaned for a short period of time and must be backed by a genuine purchase order (normally from overseas).

Firms with partners and working shareholders received the full amount in 46.15% of applications. This set of results with regard to the full amount received appears largely a function of the strong relationship between partners and working shareholders and the firms. Both sides should know each other very well and they both should also have a good knowledge and understanding of the businesses and how they are doing.

Looking at the reduced amount of external finance received by source, it is interesting that bank overdrafts were again near the bottom in terms of proportions of firms with this outcome. Indeed, 19.40%, slightly under 1 in 5 firms, received a reduced amount of finance from bank overdraft applications. This was largely explained by the nature of grants in China where a reduced amount of finance being

awarded is more the norm. It would also be interesting to compare the performance of firms who received the full amount against firms who only received a reduced amount of the finance they requested, hence finding a way to discover how efficiently financial resources were allocated.

Similarly, 20.99% of firms approaching external equity providers received a reduced amount of finance. Whilst the above value is slightly higher than that found for bank overdrafts, this again represents a source of finance which is only offering a reduced amount of finance to slightly more than one in five firms. Moreover, the number of firms approaching external equity, at 81, is not an insubstantial number and reinforces the fact that the relative and absolute success rate with external equity providers in Beijing is not very encouraging.

Long-term bank loans (38.92%) and factoring or invoice discounting firms (38.16%) both gave reduced amounts of finance to slightly less than two out of five of the applications. These results show the conservative nature of finance providers when approving long-term loans by offering reduced amounts rather than the full amount applied for. For both banks and factoring or invoice discounting firms, relationship lending is a vital if not the only solution to secure a long-term loan in China.

Putting together the full or reduced amounts of finance arguably gives a better benchmark in gauging the relative success of applications for external finance. Responses showed that 89.23% of firms applying to partners or working shareholders received the full or a reduced amount of finance. Thus, nearly nine out of ten firms were totally successful or had some amount of success from applying to partners or working shareholders.

In addition, 78.63% of firms applying for short-term bank finance received the full or a reduced amount of the finance sought, so, more than three quarters of firms applying for short-term bank finance were totally successful or had some measure of success in securing this. Thereafter there is an approximate 10% reduction in firms receiving the full or a reduced amount of finance, being 68.42% from factoring or invoice discounting firms.

Of firms turning to bank loans, 55.38% received either the full or a reduced amount of finance. Thus, for bank loans the proportion of totally or partially successful firms is slightly more than one in two.

Grants of the full or reduced amount were received by 40.91% of firms applying. This result can firstly be explained by the relative newness of grants and government interventions to actively assist private sector firms in China. Secondly, the pots of money and the number of schemes or types of grant assistance are still relatively modest – especially in comparison to western countries such as the UK.

Looking at external equity and bank overdrafts, the proportion of firms receiving the full or a reduced amount of finance is low in absolute and also in relative terms compared to the other sources of finance at 29.63% and 26.87%, respectively. Whilst both of these are new sources of finance and new channels for the firms to utilise, they are both substantially lower than the other sources of finance.

The row in Table 7.4 headed No Finance offers a stark corollary of the full or the reduced amount of finance received. At one extreme are partners and working shareholders who offered no finance to only 10.77% of firms – around one in ten firms, whilst at the other extreme there is external equity, and bank overdrafts which provided no finance to 70.37% and 73.13% of firms respectively. Putting the

information differently, the external equity providers and bank overdrafts are typically going to provide no finance to the vast majority of firms.

### 7.3.1 Full or Reduced Finance by Source

The previous section 7.3 has provided an overview of the outcomes of applications for finance, by source. Attention now centres upon looking at each of the sources of finance and exploring the extent to which innovation was, or was not, related systematically related to the firms having favourable outcomes. In the cross-tabulations the yardstick utilised is whether the firm received the full amount or a reduced amount of finance, by source. In this section the term ‘successful’ means that either the full or a reduced amount of finance was received.

#### *Bank overdrafts, short-term and long-term bank loans*

The hypothesis H4 was that innovative ventures will possess a greater likelihood of having been refused access to external finance compared to non-innovating ventures. In other words, the rate of success of innovators will be lower than that of non-innovators. The results however with regard to bank overdrafts, and short-term and long-term bank-loans are counter to our predictions and showed that the innovators were more likely to be successful than the non-innovators.

In Table 7.5, 33.33% of product innovators and 6.25% of non-product innovators, and 33.33% of distribution innovators and 17.86% of non-distribution innovators were successful in their applications for bank overdrafts, and these relationships were both statistically significant at the 0.05 level. This pattern is also reflected in the input measure of innovation, R&D expenditure, where the firms with the greater levels of turnover devoted to R&D were more likely to have been successful in their application for a bank overdraft.

It was found that 59.73% of product innovators and 37.84% of non-product innovators, and 62.50% of process innovators with 48.98% of non-process innovators

were successful on their applications for long-term bank finance, as 64.15% were of supply innovators and 43.75% of non-supply innovators. In these three cases the relationships were statistically significant at the 0.05, 0.05 and 0.01 level, respectively. Applications from 61.11% of work innovators and 47.44% of non-work innovators were successful for long-term bank finance although the relationship was only weakly statistically significant at the 0.10 level.

With regard to the relationship between innovation and short-term bank loans, these are much weaker than was found for the other two bank sources. Indeed, there was only one statistically significant relationship between the output measure of innovation and successfully securing short term bank finance and that was for distribution innovation, and this was only significant at the 0.10 level.

Successful applications for bank overdrafts from 30.77% of manufacturing firms and 21.43% of service sector firms showed this relationship was statistically significant at the 0.01 level. The size of the firms was positively statistically significantly related to the successful applications for both long-term and short-term bank finance and in both cases the relationships were highly statistically significant at the 0.01 level.

The successful access to long-term bank finance was statistically significantly at the 0.05 level related to the age of the businesses. Here, 42.62% of firms aged 1-5 years old, 58.44% of firms aged 6-9 years old, and 66.67% of firms aged  $\geq 10$  years old were successfully able to access long-term bank finance.

In addition, 61.05% of non-family businesses and 49.45% of family businesses were successful in accessing long-term bank finance and this relationship was also statistically significant at the 0.05 level.

Responses showed that 86.99% of entrepreneurs with degrees and 71.22% of those without degrees were able to successfully secure short-term bank finance and this relationship was statistically significant at the 0.01 level, with 85.88% of exporters and 75.14% of the non-exporters also being able to access short-term bank finance.

**Table 7.5: Descriptive statistics – Successful accessing, either full or reduced amount, of those applying for external finance by source**

	Bank's Overdraft	n	$\chi^2$	Bank Loan ( $\geq$ 2 years)	n	$\chi^2$
<b>All</b>	26.87	67		55.38	186	
Manufacturing	<b>30.77</b>	39	<b>19.443<sup>a</sup></b>	<b>52.68</b>	112	<b>6.844<sup>b</sup></b>
Services	<b>21.43</b>	28		<b>59.46</b>	74	
8-19 employees	25.00	28	1.684	<b>33.96</b>	53	<b>18.978<sup>a</sup></b>
20-49 employees	33.33	15		<b>56.67</b>	60	
50-99 employees	37.50	8		<b>62.16</b>	37	
100-199 employees	12.50	8		<b>70.00</b>	20	
200-499 employees	25.00	8		<b>87.50</b>	16	
1-5 years old	21.05	19	0.479	<b>42.62</b>	61	<b>6.784<sup>b</sup></b>
6-9 years old	28.57	35		<b>58.44</b>	77	
$\geq$ 10 years old	30.77	13		<b>66.67</b>	48	
Family Business	22.22	27	0.496	<b>49.45</b>	91	<b>6.831<sup>b</sup></b>
Non Family Business	30.00	40		<b>61.05</b>	95	
Male	26.00	50	0.075	53.85	143	0.586
Female	29.41	17		60.47	43	
18-30 years old	<b>46.15</b>	13	6.563 <sup>c</sup>	<b>51.85</b>	27	<b>6.665<sup>c</sup></b>
31-45 years old	<b>18.42</b>	38		<b>53.51</b>	114	
46-55 years old	<b>26.67</b>	15		<b>57.89</b>	38	
$\geq$ 56 years old	<b>100</b>	1		<b>85.71</b>	7	
Relative Role Model	36.36	22	1.504	<b>44.59</b>	74	<b>5.782<sup>b</sup></b>
No Relative Role Model	22.22	45		<b>62.50</b>	112	
Registered Business	<b>25.00</b>	36	<b>14.252<sup>a</sup></b>	<b>51.28</b>	78	<b>14.328<sup>a</sup></b>
Partnership	<b>66.67</b>	12		<b>54.05</b>	37	
Limited liability	<b>5.26</b>	19		<b>60.56</b>	71	
Degree	<b>24.24</b>	33	<b>5.807<sup>b</sup></b>	61.11	90	0.554
No Degree	<b>29.41</b>	34		50.00	96	
Exporter	23.53	17	0.129	54.90	51	0.006
Non-Exporter	28.00	50		55.76	135	
Innovator – Product	<b>33.33</b>	51	<b>5.884<sup>b</sup></b>	<b>59.73</b>	149	<b>5.749<sup>b</sup></b>
None	<b>6.25</b>	16		<b>37.84</b>	37	
Innovator – Process	31.43	35	0.777	62.50	88	<b>5.998<sup>b</sup></b>
None	21.88	32		48.98	98	
Innovator – Work	29.73	37	0.334	<b>61.11</b>	108	<b>3.428<sup>c</sup></b>
None	23.33	30		<b>47.44</b>	78	
Innovator – Supply	32.43	37	1.303	<b>64.15</b>	106	<b>7.679<sup>a</sup></b>
None	20.00	30		<b>43.75</b>	80	
Innovator – Markets	30.23	43	0.693	57.14	119	0.417
None	20.83	24		52.24	67	
Innovator – Admin	29.41	34	0.228	61.45	83	2.234
None	24.24	33		50.49	103	
Innovator – Distribution	<b>33.33</b>	39	<b>3.999<sup>b</sup></b>	60.00	100	1.871
None	<b>17.86</b>	28		50.00	86	
R&D Expenditure as a % of turnover: None	<b>11.11</b>	9	<b>19.776<sup>a</sup></b>	<b>50.00</b>	14	<b>17.636<sup>a</sup></b>
1-2%	<b>21.05</b>	19		<b>37.10</b>	62	
3-5%	<b>30.77</b>	13		<b>61.22</b>	49	
6-10%	<b>28.57</b>	14		<b>79.41</b>	34	
11-20%	<b>33.33</b>	6		<b>64.29</b>	14	
$\geq$ 21%	<b>50.00</b>	6		<b>53.85</b>	13	

<sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

**Table 7.6: Descriptive statistics – Successful accessing, either full or reduced amount, of external finance by source**

	Bank Loan (< 2 years)	n	$\chi^2$	External Equity	n	$\chi^2$
<b>All</b>	78.63	262		29.63	81	
Manufacturing	79.87	159	0.375	26.67	45	0.426
Services	76.70	103		33.33	36	
8-19 employees	<b>61.36</b>	88	<b>24.423<sup>a</sup></b>	<b>11.54</b>	26	<b>11.340<sup>b</sup></b>
20-49 employees	<b>87.80</b>	82		<b>21.74</b>	23	
50-99 employees	<b>84.09</b>	44		<b>52.94</b>	17	
100-199 employees	<b>86.21</b>	29		<b>50.00</b>	6	
200-499 employees	<b>94.74</b>	19		<b>44.44</b>	9	
1-5 years old	75.70	107	0.926	30.3	33	0.812
6-9 years old	80.81	99		25.0	132	
≥10 years old	80.36	56		37.5	116	
Family Business	77.95	127	0.067	29.41	34	0.001
Non Family Business	79.26	135		29.79	47	
Male	78.64	206	0.004	28.81	59	0.069
Female	78.57	56		31.82	22	
18-30 years old	<b>58.06</b>	31	<b>6.885<sup>c</sup></b>	22.22	18	1.208
31-45 years old	<b>83.23</b>	161		31.37	51	
46-55 years old	<b>77.78</b>	54		36.36	11	
≥56 years old	<b>75.00</b>	16		0	1	
Relative Role Model	79.44	155	0.071	25.00	28	0.439
No Relative Role Model	78.06	107		32.08	53	
Registered Business	75.65	115	2.323	27.03	37	0.222
Partnership	85.07	67		31.58	19	
Limited liability	77.50	80		32.00	25	
Degree	<b>86.99</b>	123	<b>9.655<sup>a</sup></b>	28.89	45	0.027
No Degree	<b>71.22</b>	139		30.56	36	
Exporter	<b>85.88</b>	85	<b>3.942<sup>b</sup></b>	<b>42.31</b>	26	<b>11.402<sup>b</sup></b>
Non-Exporter	<b>75.14</b>	177		<b>23.64</b>	55	
Innovator – Product	79.50	200	0.384	30.56	72	0.266
None	75.81	62		22.22	9	
Innovator – Process	74.75	99	1.424	30.23	43	0.016
None	80.98	163		28.95	38	
Innovator – Work	76.99	113	0.316	<b>34.69</b>	49	<b>3.509<sup>c</sup></b>
None	79.87	149		<b>21.88</b>	32	
Innovator – Supply	78.07	114	0.037	33.33	39	0.495
None	79.05	148		26.19	42	
Innovator – Markets	78.18	165	0.052	<b>37.10</b>	62	<b>12.068<sup>a</sup></b>
None	79.38	97		<b>5.26</b>	19	
Innovator – Admin	79.61	103	0.098	35.42	48	1.892
None	77.99	159		21.21	33	
Innovator – Distribution	<b>84.35</b>	115	<b>3.993<sup>c</sup></b>	27.50	41	0.172
None	<b>74.15</b>	147		31.71	40	
R&D Expenditure as a % of turnover: None	<b>73.68</b>	19	<b>18.129<sup>a</sup></b>	50.00	4	6.425
1-2%	<b>78.64</b>	103		16.67	24	
3-5%	<b>70.27</b>	74		39.13	23	
6-10%	<b>91.67</b>	36		15.38	13	
11-20%	<b>90.48</b>	21		50.00	16	
≥21%	<b>77.78</b>	9		36.36	11	

n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

### *Equity*

Two types of innovation were found to be statistically related to the accessing of equity finance – work innovation and market innovation and these were statistically significant at the 0.10 and 0.01 level, respectively. Access to equity finance was successful by 34.69% of work innovators and 21.88% of non-work innovators, and 37.10% of market innovators and 5.26% of non-market innovators. Thus, the results with regard to equity finance and innovation are not supportive of hypothesis H4.

Two of the control variables were found to be statistically significant at the 0.05 level related to the accessing of equity finance and they were exporter firms and the size of the firm. Whereas 42.31% of exporters and 23.64% of non-exporters accessed equity finance, only 11.54% of firms with 8-19 employees were able to secure equity finance but the success rate increased substantially as the firm size increased, to 21.74% of firms with 20-49 employees and 52.94% of those with 50-99 employees. There was a decrease to 44.44% for firms with between 200-499 employees.

*Grants, Factoring/ Invoice Discounting, and Partners*

Table 7.7 presents the cross-tabulations of successfully accessing either the full or a reduced amount of external finance from the sources of grants, and factoring or invoice discounting firms, and Table 7.8 presents corresponding values for partners and working shareholders.

Work innovation firms were more likely to be successful in accessing finance from grants than non-work innovation firms, and this relationship was highly statistically significant at the 0.01 level. However, non-supply innovators were more likely to be successful in accessing grants finance compared to the supply innovators and this relationship was also statistically significant at the 0.01 level. More specifically, 34.78% of supply innovators and 47.62% of non-supply innovators were successful in financing grants, with this pattern of results also being found for distribution innovation and being statistically significant at the 0.05 level. Grant applications from 28.00% of distribution innovators and 57.89% of non-distribution innovators were successful. Thus, there is evidence in support of hypothesis H4 with regard to accessing finance from grants.

However, innovation was not statistically significantly related to the accessing of factor or invoice discounting firms with regard to any of the eight measures of innovation. Thus, the evidence with regard to factor or invoice discounting firms is not supportive of hypothesis H4.

Two types of innovation were statistically significantly related to the successful accessing of finance from partners or working shareholders and these were supply innovation and distribution innovation which were statistically significant at the 0.10 and 0.05 levels, respectively. In both cases, the innovators were more

successful than the non-innovators; this was counter to our expectations, and clearly not supportive of hypothesis H4.

Several of the control variables were found to be statistically significant in Tables 7.6 and 7.7. Family businesses were less likely to be successful in gaining financial support from grants, but more successful in accessing factor or invoice discounting firms for finance. The age of the owner-managers was statistically significant at the 0.05 level or better, in backing from accessing grants, factor or invoice discounting firms, and partners or working shareholders. Success was positively related to firm age with regard to factoring or invoice discounting firms, and also with partners and working shareholders; but, it was negatively related to grants.

The success of 52.38% of degree holders was greater than 30.43% of non-degree holders in accessing grants finance, and this relationship was statistically significant at the 0.01 level.

Exporters were more likely to be successful in accessing finance from grants, but exporters were less likely to be successful in regard to finance from factoring or invoice discounting firms, compared with the non-exporting firms.

**Table 7.7: Descriptive statistics – Successful accessing, either full or reduced amount, of external finance by source**

	Grants	n	$\chi^2$	Factoring/ Invoice Discounting	n	$\chi^2$
<b>All</b>	40.91	44		68.42	76	
Manufacturing	42.42	33	0.125	71.74	46	0.594
Services	36.36	11		63.33	30	
8-19 employees	46.67	15	0.576	<b>47.37</b>	19	<b>8.011<sup>c</sup></b>
20-49 employees	33.33	9		<b>63.64</b>	22	
50-99 employees	44.44	9		<b>78.57</b>	14	
100-199 employees	33.33	3		<b>84.62</b>	13	
200-499 employees	37.50	8		<b>87.50</b>	8	
1-5 years old	40.00	15	0.637	<b>57.14</b>	35	<b>8.112<sup>c</sup></b>
6-9 years old	35.29	17		<b>76.00</b>	25	
≥10 years old	50.00	12		<b>81.25</b>	16	
Family Business	<b>37.50</b>	16	<b>3.995<sup>b</sup></b>	<b>70.59</b>	34	<b>3.997<sup>b</sup></b>
Non Family Business	<b>42.86</b>	28		<b>66.67</b>	42	
Male	39.39	33	0.125	67.80	59	0.554
Female	45.45	11		70.59	17	
18-30 years old	<b>57.14</b>	7	<b>7.87<sup>b</sup></b>	<b>50.00</b>	14	<b>19.119<sup>a</sup></b>
31-45 years old	<b>54.55</b>	22		<b>68.63</b>	51	
46-55 years old	<b>8.33</b>	123		<b>87.50</b>	8	
≥56 years old	<b>33.33</b>	18		<b>100</b>	3	
Relative Role Model	50.0	26	0.776	<b>48.15</b>	27	<b>7.966<sup>a</sup></b>
No Relative Role Model	34.62	18		<b>79.59</b>	49	
Registered Business	38.89	18	1.483	72.73	33	0.516
Partnership	25.00	8		63.64	11	
Limited liability	50.0	18		65.62	32	
Degree	<b>52.38</b>	21	<b>19.711<sup>a</sup></b>	67.57	37	0.024
No Degree	<b>30.43</b>	23		69.23	39	
Exporter	<b>46.67</b>	29	<b>12.554<sup>a</sup></b>	<b>65.22</b>	23	<b>3.999<sup>b</sup></b>
Non-Exporter	<b>37.93</b>	15		<b>69.81</b>	53	
Innovator – Product	40.48	2	0.004	69.70	66	0.378
None	50.00	42		60.00	10	
Innovator – Process	40.00	30	0.032	68.57	35	0.001
None	42.86	14		68.29	41	
Innovator – Work	<b>44.83</b>	29	<b>13.540<sup>a</sup></b>	67.44	43	0.044
None	<b>33.33</b>	15		69.70	33	
Innovator – Supply	<b>34.78</b>	23	<b>13.748<sup>a</sup></b>	73.81	42	1.262
None	<b>47.62</b>	21		61.76	34	
Innovator – Markets	40.62	32	0.004	66.67	54	0.266
None	41.67	12		72.73	22	
Innovator – Admin	40.91	22	0.000	67.57	37	0.024
None	40.91	22		69.23	39	
Innovator – Distribution	<b>28.00</b>	25	<b>3.993<sup>b</sup></b>	68.42	38	0.000
None	<b>57.89</b>	19		68.42	38	
R&D Expenditure as a % of turnover: None	50.00	2	5.046	100	3	6.914
1-2%	66.67	12		62.96	27	
3-5%	33.33	15		71.43	28	
6-10%	25.00	8		83.33	12	
11-20%	25.00	4		25.00	4	
≥21%	33.33	3		50.00	2	

n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

**Table 7.8: Descriptive statistics – Successful accessing, either full or reduced amount, of external finance by source**

	Partners/ Working Shareholders	n	$\chi^2$
<b>All</b>	89.23	195	
Manufacturing	88.24	102	0.221
Services	90.32	93	
8-19 employees	<b>84.21</b>	76	<b>8.015<sup>c</sup></b>
20-49 employees	<b>90.74</b>	54	
50-99 employees	<b>94.74</b>	38	
100-199 employees	<b>93.33</b>	15	
200-499 employees	<b>91.67</b>	12	
1-5 years old	91.21	91	0.937
6-9 years old	86.36	66	
≥10 years old	89.47	38	
Family Business	86.67	75	0.838
Non Family Business	90.83	120	
Male	89.61	154	0.110
Female	87.80	41	
18-30 years old	<b>79.31</b>	29	<b>15.283<sup>a</sup></b>
31-45 years old	<b>91.67</b>	120	
46-55 years old	<b>86.11</b>	36	
≥56 years old	<b>100</b>	10	
Relative Role Model	87.88	66	0.190
No Relative Role Model	89.92	129	
Registered Business	85.37	82	2.203
Partnership	91.84	49	
Limited liability	92.19	64	
Degree	90.38	104	0.309
No Degree	87.91	91	
Exporter	90.38	52	0.098
Non-Exporter	88.81	143	
Innovator – Product	88.59	149	0.269
None	91.30	46	
Innovator – Process	88.66	97	0.066
None	89.80	98	
Innovator – Work	88.29	111	0.238
None	90.48	84	
Innovator – Supply	<b>93.26</b>	89	<b>2.764<sup>c</sup></b>
None	<b>85.85</b>	106	
Innovator – Markets	88.89	135	0.053
None	90.00	60	
Innovator – Admin	92.93	99	2.863
None	85.42	96	
Innovator – Distribution	<b>94.51</b>	91	<b>4.940<sup>b</sup></b>
None	<b>84.62</b>	104	
R&D Expenditure as a % of turnover: None	90.91	22	2.750
1-2%	89.39	66	
3-5%	84.44	45	
6-10%	88.57	35	
11-20%	94.44	18	
≥21%	100	9	

n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

#### **7.4 Awareness**

Tables 7.9 to 7.11 show the levels of awareness of the sources of external finance. The levels of awareness are approaching 100%, or full awareness, for bank loans, both short duration (99.34%) and long term duration (98.89%), as well as of partners or working shareholders (94.69%). The level of awareness of bank overdrafts was high at 83.41%, but is clearly substantially less than that of bank loans of either short or long term duration.

The level of awareness of factor invoicing and discounting firms was lower than debt finance and was 77.21%, so slightly more than three quarters of all entrepreneurs. Typically, exporting firms use factoring companies more frequently as the payment period for an order placed in another country is usually much longer, hence these firms often have to work with a tighter working capital and have to realise cash from unsettled invoices at a discounted rate. Therefore, it is understandable that the actual needs of businesses in different sectors are reflected in the level of awareness of the sources of finance and it is anticipated that the bank loan would be the most obvious source of finance in the first place.

The level of awareness of grants was approaching three quarters of entrepreneurs (74.75%). This result is interesting and shows that whilst this source of finance is relatively new, roughly three out of four owner-managers were aware of grants. Both central and local governments have facilities set aside to support small businesses, especially innovative ones. Although it is good to know that government grants are well known in the private sector, the eligibility criterion for the fund can be difficult to meet and sometimes it is arguable whether it is worthwhile to alter investment projects to fit the requirements set out by the authorities. There is also a debate on how far the amount of the grant will lead the project on and after the grant

is exhausted, which sources of finance would be most suitable to take the project into the next stage.

The lowest level of awareness was for equity finance, with only 61.9%, or six out of ten, of owner-managers being aware of it. The corollary is that approaching four out of ten firms are not aware of equity finance. Whilst all sources of finance are not equally appropriate for all firms at all points in time, a lack of awareness of any of them is a handicap. In other words, if a firm is unaware of a source then it may be losing out and this may place such a firm at a disadvantage in relation to other firms.

#### **7.4.1 Crosstabulations**

In this section in Tables 7.9 to 7.11 the analysis focuses upon exploring the levels of awareness of each source of finance. Hypothesis H5 relates to risk capital so accordingly external equity capital awareness is analysed first, rather than the three types of bank finance which were tested first in section 7.3.2 and 7.2.2.

##### *Equity Finance*

The hypothesis H5 suggested that there would be a lower level of awareness of equity finance by the non-innovators compared to the innovators. For five of the types of innovation the non-innovators had a lower awareness of equity finance compared to the innovating firms which was statistically significant at the 0.10 level, or better. The five types of innovation which were statistically significant at the 0.10 level or better were product, process, supply, administration and distribution. In each case the non-innovators were approximately 10% less aware of equity finance

compared to the innovators with the exception of distribution innovation where the difference was 13%. Thus, the evidence in Table 7.9 supports hypothesis H5.

Three other control variables were found to be statistically significant at the 0.1 level or better, related to the level of awareness of equity. Of these, 67.46% of entrepreneurs with degrees were aware of equity finance which was substantially more than the 57.20% reported by entrepreneurs with no degrees. Moreover, 70.27% of exporters and 59.24% of non-exporters were aware of equity finance. The age of the entrepreneurs was highly statistically significant at the 0.01 level related to the level of awareness of equity finance. The level of awareness was highest for entrepreneurs at 65.61% for those aged 31-45 years old, and was lowest at 50.00% for the oldest group of entrepreneurs who were  $\geq 56$  years old.

**Table 7.9: Descriptive statistics – awareness of external finance by source**

	External Equity	$\chi^2$	n
<b>All</b>	61.95		452
Manufacturing	62.45	0.067	261
Services	61.26		191
8-19 employees	<b>57.22</b>	<b>8.977<sup>c</sup></b>	180
20-49 employees	<b>62.50</b>		128
50-99 employees	<b>65.38</b>		78
100-199 employees	<b>67.50</b>		40
200-499 employees	<b>73.08</b>		26
1-5 years old	63.48	1.443	178
6-9 years old	63.28		177
≥10 years old	56.70		97
Family Business	60.19	0.545	216
Non Family Business	63.56		236
Male	62.46	0.193	357
Female	60.00		95
18-30 years old	<b>55.32</b>	<b>14.883<sup>a</sup></b>	47
31-45 years old	<b>65.61</b>		285
46-55 years old	<b>57.45</b>		94
≥56 years old	<b>50.00</b>		26
Relative Role Model	62.28	0.012	167
No Relative Role Model	61.75		285
Registered Business	60.78	2.125	204
Partnership	67.96		103
Limited liability	59.31		145
Degree	<b>67.46</b>	<b>5.020<sup>b</sup></b>	209
No Degree	<b>57.20</b>		243
Exporter	<b>70.27</b>	<b>4.324<sup>b</sup></b>	111
Non-Exporter	<b>59.24</b>		341
Innovator – Product	<b>64.56</b>	<b>3.677<sup>c</sup></b>	333
None	<b>54.62</b>		119
Innovator – Process	<b>68.60</b>	<b>5.221<sup>b</sup></b>	172
None	<b>57.86</b>		260
Innovator – Work	64.53	1.045	203
None	59.84		249
Innovator – Supply	<b>67.22</b>	<b>3.531<sup>c</sup></b>	180
None	<b>58.46</b>		272
Innovator – Markets	63.70	0.878	270
None	59.34		182
Innovator – Admin	<b>68.36</b>	<b>5.078<sup>b</sup></b>	177
None	<b>57.82</b>		275
Innovator – Distribution	<b>70.11</b>	<b>8.770<sup>a</sup></b>	184
None	<b>56.34</b>		268
R&D Expenditure as a % of turnover: None	61.67	6.413	60
1-2%	57.69		156
3-5%	62.71		118
6-10%	63.77		69
11-20%	62.50		32
≥21%	88.24		17

n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

*Bank overdrafts, short-term and long-term bank loans*

Innovation was not found to be statistically significant with regard to the levels of awareness for the three types of bank finance. There were only two exceptions to this statement. Bank overdrafts were known by 79.31% of work innovators and 86.75% of non-work innovators and this result was statistically significant at the 0.05 level. However, 100% of supply innovators and 98.16% of non-supply innovators were aware of long-term bank finance, and this was found to be weakly statistically significant at the 0.10 level.

Rather, it was control variables which were found to be statistically significant at the 0.10 level or better, related to the levels of awareness of the three types of bank finance. Of these, 85.82% of manufacturing firms and 80.10% of service sector firms were aware of bank overdrafts and this was weakly statistically significant at the 0.10 level. Younger businesses aged 1-5 years reported the lowest awareness of bank overdrafts at 77.53%, substantially less than the 86.44% awareness for 6-9 years old businesses and the 88.66% reported by businesses  $\geq 10$  years old, and this was statistically significant at the 0.05 level. Registered businesses found lower levels of awareness (79.41%) for bank overdrafts compared to partnerships (87.38%) and limited liability (86.21%).

Unsurprisingly, there was only one statistically significant difference between the control variables and the short-term and long-term bank loans given the very high levels of awareness for these sources. This was that only 93.62% of younger entrepreneurs, the 18-30 year olds, were aware of long-term bank loans which was less than the complete awareness reported for the three older age groups.

**Table 7.10: Descriptive statistics – awareness of external finance by source**

	Bank's Overdraft	$\chi^2$	Bank Loan ( $\geq 2$ years)	$\chi^2$	Bank Loan (< 2 years)	$\chi^2$	n
<b>All</b>	83.41		98.89		99.34		452
Manufacturing	<b>85.82</b>	<b>3.000<sup>c</sup></b>	98.85	0.011	99.23	0.010	261
Services	<b>80.10</b>		98.95		99.48		191
8-19 employees	<b>83.89</b>	<b>9.999<sup>c</sup></b>	98.33	3.745	98.89	4.142	180
20-49 employees	<b>85.94</b>		99.22		100		128
50-99 employees	<b>75.64</b>		100		100		78
100-199 employees	<b>92.50</b>		100		97.5		40
200-499 employees	<b>76.92</b>		96.15		100		26
1-5 years old	<b>77.53</b>	<b>7.556<sup>b</sup></b>	98.31	1.025	98.88	1.245	178
6-9 years old	<b>86.44</b>		99.44		99.44		177
$\geq 10$ years old	<b>88.66</b>		98.97		100		97
Family Business	85.65	1.501	98.61	0.302	99.07	0.431	216
Non Family Business	81.36		99.15		99.58		236
Male	82.91	0.299	98.88	0.003	99.44	0.276	357
Female	85.26		98.95		98.95		95
18-30 years old	<b>78.72</b>	<b>13.883<sup>a</sup></b>	<b>93.62</b>	<b>13.73<sup>a</sup></b>	98.88	1.245	47
31-45 years old	<b>83.16</b>		<b>99.30</b>		99.44		285
46-55 years old	<b>88.30</b>		<b>100</b>		100		94
$\geq 56$ years old	<b>76.92</b>		<b>100</b>		100		26
Relative Role Model	86.23	1.522	98.8	0.020	99.40	0.017	167
No Relative Role Model	81.75		98.95		99.30		285
Registered Business	<b>79.41</b>	<b>5.999<sup>c</sup></b>	99.02	0.146	99.51	3.615	204
Partnership	<b>87.38</b>		99.03		98.06		103
Limited liability	<b>86.21</b>		98.62	1.400	100	0.202	145
Degree	83.25	0.007	99.52		99.18		209
No Degree	83.54		98.35		99.52		243
Exporter	81.08	0.575	98.20	0.651	100	0.983	111
Non-Exporter	84.16		99.12		99.12		341
Innovator – Product	82.58	0.621	98.80	0.104	99.40	0.076	333
None	85.71		99.16		99.16		119
Innovator – Process	82.56	0.145	98.84	0.013	99.42	0.029	172
None	83.93		98.93		99.29		260
Innovator – Work	<b>79.31</b>	<b>4.469<sup>b</sup></b>	98.52	0.465	99.01	0.578	203
None	<b>86.75</b>		99.20		99.60		249
Innovator – Supply	81.11	1.139	<b>100</b>	<b>3.346<sup>c</sup></b>	99.44	0.053	180
None	84.93		<b>98.16</b>		99.26		272
Innovator – Markets	81.48	1.797	98.52	0.863	99.26	0.060	270
None	86.26		99.45		99.45		182
Innovator – Admin	82.49	0.178	99.44	0.779	99.44	0.043	177
None	84.00		98.55		99.27		275
Innovator – Distribution	82.07	0.403	99.46	0.898	99.46	0.068	184
None	84.33		98.51		99.25		268
R&D Expenditure as a % of turnover: None	78.33	5.273	98.33	1.471	98.33	0.701	60
1-2%	83.97		99.36		100		156
3-5%	87.29		98.31		99.15		118
6-10%	78.26		98.55		98.55		69
11-20%	81.25		100		100		32
$\geq 21\%$	94.12		100		100		17

n=452    <sup>c</sup> p < 0.10;    <sup>b</sup> p < 0.05;    <sup>a</sup> p < 0.01

*Grants, Factoring/ Invoice Discounting, and Partners*

There was only one instance of innovation being statistically significantly related to the level of awareness of grants, and that was for administration innovation (Table 7.11). In this instance, 78.91% of non-innovators were aware of grants compared to 68.36% of innovators and this was statistically significant at the 0.05 level. Innovation, as examined by the eight measures was not statistically related at the 0.10 level, or better, to the level of awareness of factoring and invoice discounting firms, and partners and working shareholders.

The size of the business was statistically related to the level of awareness of both factoring and invoice discounting firms, and to partners and working shareholders, and in both cases the relationship was weakly statistically significant at the 0.10 level.

The age of the entrepreneur was related to the awareness of factoring and invoice discounting firms and this was statistically significant at the 0.01 level. The awareness of this latter source was lowest for those entrepreneurs aged  $\geq 56$  years old.

**Table 7.11: Descriptive statistics – awareness of external finance by source**

	Partners/ Working SHs		Grants	X <sup>2</sup>	Factoring/ Invoice Discounting	χ <sup>2</sup>	n
<b>All</b>	94.69		74.75		77.21		452
Manufacturing	94.25	0.235	77.78	2.946	79.69	2.161	261
Services	95.29		70.68		73.82		191
8-19 employees	<b>92.22</b>	<b>8.917<sup>c</sup></b>	72.22	1.366	<b>73.33</b>	<b>9.059<sup>c</sup></b>	180
20-49 employees	<b>96.09</b>		76.56		<b>79.69</b>		128
50-99 employees	<b>100</b>		75.64		<b>71.79</b>		78
100-199 employees	<b>90.0</b>		75.00		<b>87.50</b>		40
200-499 employees	<b>96.15</b>		80.77		<b>92.31</b>		26
1-5 years old	96.63	2.322	74.72	0.016	74.16	2.882	178
6-9 years old	93.79		74.58		81.36		177
≥10 years old	92.78		75.26		75.26		97
Family Business	93.52	1.130	74.54	0.013	79.66	1.683	216
Non Family Business	95.76		75.00		74.54		236
Male	94.12	1.108	73.67	1.108	77.59	0.138	357
Female	96.84		78.95		75.79		95
18-30 years old	91.49	2.152	<b>57.45</b>	<b>13.753<sup>a</sup></b>	<b>72.34</b>	<b>13.987<sup>a</sup></b>	47
31-45 years old	95.79		<b>77.89</b>		<b>77.89</b>		285
46-55 years old	93.62		<b>78.72</b>		<b>80.85</b>		94
≥56 years old	92.31		<b>57.69</b>		<b>65.38</b>		26
Relative Role Model	92.81	0.466	74.25	0.039	78.44	0.228	167
No Relative Role Model	95.79		75.09		76.49		285
Registered Business	95.59	1.096	72.55	1.364	74.51	1.675	204
Partnership	95.15		78.64		80.58		103
Limited liability	93.10		75.17		78.62		145
Degree	<b>96.65</b>	<b>2.971<sup>c</sup></b>	74.64	0.043	78.47	0.345	209
No Degree	<b>93.00</b>		74.90		76.13		243
Exporter	94.59	0.011	77.48	0.568	79.28	0.357	111
Non-Exporter	94.72		73.90		76.54		341
Innovator – Product	94.59	0.023	75.98	0.961	77.48	0.051	333
None	94.96		71.43		76.47		119
Innovator – Process	95.35	0.236	73.26	0.341	79.65	0.939	172
None	94.29		75.71		75.71		260
Innovator – Work	93.60	0.878	73.40	0.372	79.31	0.922	203
None	95.58		73.90		75.50		249
Innovator – Supply	95.00	0.057	77.22	0.947	80.56	1.900	180
None	94.49		73.16		75.00		272
Innovator – Markets	94.81	0.021	72.96	1.172	76.67	0.114	270
None	94.51		77.47		78.02		182
Innovator – Admin	94.35	0.070	<b>68.36</b>	<b>6.352<sup>b</sup></b>	77.97	0.094	177
None	94.91		<b>78.91</b>		76.73		275
Innovator – Distribution	95.11	0.108	76.09	0.282	78.80	0.447	184
None	94.40		73.88		76.12		268
R&D Expenditure as a % of turnover: None	91.67	3.544	75.00	3.156	75.00	1.570	60
1-2%	93.59		71.79		75.64		156
3-5%	95.76		79.66		77.12		118
6-10%	97.10		76.81		79.71		69
11-20%	93.75		68.75		84.38		32
≥21%	100		70.59		76.47		17

n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

## 7.5 Regression Results and Discussion

In investigating the proposals for requests for finance it needs to be noted that clearly the quality of the applications will vary. In these circumstances it is necessary for the characteristics of the firms and their owner-managers to be controlled for in our investigation of the financing of innovation within Beijing. To that purpose, in order to better establish whether innovation was the driving force in explaining differences in the rates of applications for external finance, multivariate logistic regression analysis was performed and the results are shown in Table 7.12.

The regression results in Table 7.12 relate to the dichotomous logit model for applied for finance, by source. In this model, applied for finance, by source (the dependent variable) takes the value of '1' if the business has applied for finance and '0' otherwise. The explanatory (or independent) variables which were developed in the first empirical chapter and which have been explored in the bivariate relationships earlier in this chapter are again utilised. The reader is again reminded that in estimating the coefficients of Logit, the maximum likelihood procedure is used. In presenting the results the researcher has reported the odds ratios and the standard errors are in parentheses. Interpreting Logit regression output in terms of odds rather than probabilities confers certain advantages. Most important among these is that  $\beta$  is a single summary statistic for the partial effect of a given predictor on the odds, controlling for other predictors in the model. Logit is simply the log of the odds of being in one versus another category of the dependent variable. The odds ratio associated with each coefficient is presented in Table 7.12. The odds ratio is a multiplicative coefficient which means that "positive" effects are greater than 1 while "negative" effects lie between 0 and 1. The odds ratio is the number by which one would multiply the odds of a business experiencing access to finance for each one unit

increase in the independent variable. An odds ratio greater than 1 indicates that the odds of a business recording an application for finance from a named source increases when the independent variable increases. An odds ratio of less than 1 indicates that the odds of a business reporting an application for finance from a named source decreases when the independent variable increases, while estimates close to 1 indicate no effect on the odds. Table 7.12 presents the estimated odds ratios associated with the different explanatory variables. The chi-square statistic for the joint impact of all the explanatory variables on the dependent variable is significant at the 0.05 level, or better, in all of the models and accordingly to save space the chi-square statistics are not reported.

As with previous studies of credit rationing (Freel, 2007), it is acknowledged that the selection of variables is unlikely to be perfect. This notwithstanding, the questionnaire, in addition to predominantly focusing upon finance and innovation, included a range of questions about the firms generally, and also questions relating to the backgrounds of the owner-managers. These have been explored earlier in the chapter at the bivariate or crosstabulation level of analysis. In this part of the chapter the method of analysis moves from bivariate to multivariate.

Firstly, in the regression models attention centres upon the innovative characteristics of the firms. The results of the multivariate regression results reported in Table 7.12 are consistent with the earlier cross-tabulation results reported in Tables 7.1 to 7.3. Taken together it is clear that innovative firms are more likely to apply for sources of external finance.

In Table 7.12 the measure of innovation included in the models is product innovation. Each of the models in 7.12 was then re-estimated replacing product innovation with process innovation; and, then again until all eight measures of

innovation had been tested. In Table 7.13 the odds ratios for each separate measure of innovation are reported. Additionally, the log likelihood and the Nagelkerke  $R^2$  for each model are reported. This approach was followed to synthesise the results in a more digestible format for the reader.

*Bank overdrafts, short-term and long-term bank loans*

Process, work, supply, administration and distribution innovators were more likely than their non-innovating counterparts to have applied for bank overdrafts at the 0.10 level, or better.

Product, process, work, supply, administration and distribution innovators were more likely in comparison with their corresponding non-innovating firms to have applied for long-term bank finance at the 0.10 level, or better.

Supply, markets and distribution innovators were more likely compared to the non-innovating firms with regard to those three types of innovation to have applied for short-term bank finance at the 0.10 level or better.

Thus, with regard to the three types of bank finance the results of the multivariate regression models are very supportive of hypothesis H3.

Attention centres upon the control variables in the models. Whilst it may be the case that larger firms have greater amounts of capital it would still be expected that they would be more likely to apply for finance, and that they would be more likely to receive finance than smaller sized firms. Larger sized firms were more likely than smaller sized firms to have applied for bank loans, of two years or more duration at the 1% level or better. However, the size of firm was not statistically significant at the 0.10 level, or better, with regard to bank loans of less than two years duration, or with bank overdrafts in the multivariate regression models shown in Table 7.12. Thus,

whilst size had been important in the bivariate analysis, in the multivariate context the inclusion of the full set of variables renders the relationship neutralised.

Next, attention focuses upon the age of the firms. It would be expected that younger firms would be more likely to apply for finance because they needed the resources to develop their business activities; but, that the younger firms would be less likely than older firms to be successful in accessing finance because of their lack of an established track record. However, examination of the regression results showed that the age of the business was positively statistically related to the applying for bank overdrafts and bank loans of a two year or greater duration, and these were statistically significant at the 0.01 and 0.01 level, respectively. This result would be counter to the expectations of Western scholars and it simply suggests that social capital plays a vital role in bank lending decision-making processes and since younger firms have not yet been able to build solid (or close enough) entrepreneur-bank relationships, it is harder for younger firms to have access to bank loans of any duration. In the Chinese context, the relationship lending is utilised to its full extent, not just aimed at overcoming the information asymmetry problem, but rather at networking skills which are fundamental in the Chinese culture of business conducts.

Family businesses would be less likely than non-family businesses to seek finance because they would not like to risk losing autonomy of their businesses or having to divulge details about their business activities to the agents to whom finance requests were made. Family business background is of particular interest within the Chinese ideological context because it is fair to say that connection is inevitable in almost everything Chinese people do. In terms of financing, family wealth has always been a useful source of finance to small businesses which are typified by their lack of financial support from elsewhere (Pistrui et al., 2001). Traditionally, family ties are

incredibly important in Chinese culture and it is often evinced as financial support. However, in terms of the likelihood of successfully accessing finance, family businesses may or may not be more likely than non-family businesses to be successful. The results show that family businesses were less likely than non-family businesses to have applied for bank overdrafts at the 0.01 level.

The older the owner, the less likely the expectation that they would apply for finance, as they are more likely to have accumulated experience and resources and thus have a less strong need to seek further finance. However, older owners would be expected to be more likely to successfully access finance if they applied, as they are more likely to provide a strong case for finance. The regression results showed that older owners were indeed less likely to have applied for bank loans of a long term duration at the 1% level. A statistically significant relationship at the 5% level was also found between the age of the owner-managers with bank overdrafts.

Having a role model of a member of the family who has run a business before may influence the application for finance and the possibility of success. If there is a role model, an owner-manager may be more willing to make applications for finance because they are imbued with greater information and awareness of which sources are available and how they can be utilised for the benefit of the firms. But, with regard to the likelihood of being successful, there are mixed expectations – a relative having been in business may be positive or negative depending upon the previous track record of the relative and their reputation with financial providers. Turning to the results in Table 7.12, those businesses where there was a relative role model were more likely to apply for short term bank loans.

Information was available about the type of businesses and dummy variables included for limited liability companies and also partnerships, and the excluded

comparison dummy variable was registered businesses. The type of business shows in part the risk profile of the owners of the business. We had mixed expectations for how the type of business would influence access to finance.

Partnerships compared to limited liability firms were less likely to apply for bank loans of longer durations, but were more likely to apply for bank loans of a shorter duration – although this result was significant at the 10% level.

Registered businesses compared to limited liability firms were more likely to apply for bank overdrafts, and less likely to apply for long duration bank loans.

In order to be successful in foreign markets, exporters must have clear competitive advantages (i.e. substantially lower costs of goods, considerably higher quality versus price, unique knowledge such as patented products), otherwise, local firms almost always have better knowledge and understanding of their own market, in which it could be hard to compete (McDougall and Oviatt, 1996). Moreover, as the world's factory, it is clear that those firms which export clearly possess attributes different from non-exporters. We had mixed expectations on the likelihood of exporters seeking external finance. On the one hand, exporters may be more likely to apply for external finance because of a desire to expand the firms' market share and develop other new markets. This is tempered against the possibility that the firm which already exports may be more successful and have generated the necessary capital which reduces the possibility of seeking external finance, although, clearly these are matters of conjecture. This notwithstanding, it would be expected that those firms which were exporters would be less likely to be successful if they applied for external finance. Many of the arguments which were outlined earlier about innovating firms also apply to exporters. Interestingly, our results found that exporters were

more likely than non-exporters to have applied for bank loans of less than a two year duration and this relationship was statistically significant at the 1% level.

### *Equity*

5 out of 7 of the output measures of innovation were statistically significantly related to the applying for equity finance, and this was at the 0.05 level or better (Table 7.13). The input measure of innovation as represented by a series of dummy variables to capture R&D expenditure were also predominantly statistically significant at the 0.10 level or better. Thus, with regard to equity finance, the results are very supportive of hypothesis H3.

Only one of the control variables was statistically significantly related to the applying for equity finance and that was the age of the owner-manager which was positively statistically significant at the 0.05 level (Table 7.12).

### *Grants, Factoring/ Invoice Discounting, and Partners*

All of the output measures of innovation were positively statistically significantly related to the applying for finance through grants, factoring and invoice discounting firms, and from partners and working shareholders at the 0.10 level or better, with the two exceptions of administration innovation against grants, and process innovation against factoring and invoice discounting firms which were not statistically significant at the 0.10 level or better (Table 7.13). The input measure of innovation, R&D expenditure, was found to be statistically significantly related to the applications to partners and working shareholders, and factoring and invoice discounting firms at the 0.01 and 0.05 level, respectively.

A dummy variable was incorporated into the model to capture the sectoral background of the firms. It was expected that manufacturing firms would be more likely than service sector firms to have applied for finance (Westhead and Storey, 1997), and also to be less likely to have been successful, because of their need for larger amounts of capital. Sector was found to be statistically significant at the 0.10 and 0.05 level, respectively, for applications for grants and to partners or working shareholders.

Several other control variables were also statistically significant at the 0.10 level, or better. Older firms were more likely to have applied for grants than younger firms and this relationship was weakly statistically significant at the 0.10 level. The non-family businesses were more likely to have applied for grants, and also the partners and working shareholders compared to the family businesses and both of these relationships were highly statistically significant at the 0.01 level.

Older entrepreneurs were less likely than younger entrepreneurs to have applied to factoring and invoice discounting firms, and also to partners and working shareholders.

Those entrepreneurs with role models were more likely than the entrepreneurs with relative role models to have applied for grants.

Limited liability companies and also partnerships were less likely than registered businesses to have applied to factoring and invoice discounting firms and these relationships were statistically significant at the 0.10 and 0.05 levels, respectively.

**Table 7.12: Logit regression model of the probability of applying for external finance by source of finance.**

	Bank overdraft Model 1	Bank Loan ( $\geq$ 2 years) Model 2	Bank Loan (< 2 years) Model 3	External Equity Model 4	Grants Model 5	Factoring/ Invoice Discounting Firms Model 6	Partners/ Working shareholders Model 7
Sector	1.010 (0.290)	1.035 (0.219)	1.136 (0.236)	0.831 (0.223)	<b>1.867</b> <b>(0.726)<sup>c</sup></b>	1.075 (0.301)	<b>0.691</b> <b>(0.084)<sup>b</sup></b>
Size	1.163 (0.177)	<b>1.369</b> <b>(0.158)<sup>a</sup></b>	1.154 (0.135)	1.068 (0.153)	1.266 (0.231)	<b>1.558</b> <b>(0.231)<sup>a</sup></b>	0.973 (0.111)
Age of Business	<b>1.391</b> <b>(0.113)<sup>a</sup></b>	<b>1.680</b> <b>(0.298)<sup>a</sup></b>	1.040 (0.178)	1.180 (0.247)	1.615 (0.456)	1.069 (0.228)	0.850 (0.144)
Family Business	<b>0.300</b> <b>(0.097)<sup>a</sup></b>	0.844 (0.206)	0.772 (0.185)	0.613 (0.190)	<b>0.296</b> <b>(0.129)<sup>a</sup></b>	0.782 (0.248)	<b>0.492</b> <b>(0.117)<sup>a</sup></b>
Gender	0.814 (0.261)	0.803 (0.201)	0.985 (0.246)	0.716 (0.213)	0.677 (0.269)	1.103 (0.360)	1.104 (0.271)
Age of Owner-Manager	<b>0.191</b> <b>(0.136)<sup>b</sup></b>	<b>0.230</b> <b>(0.125)<sup>a</sup></b>	0.605 (0.320)	<b>0.215</b> <b>(0.143)<sup>b</sup></b>	1.202 (1.046)	<b>0.090</b> <b>(0.064)<sup>a</sup></b>	<b>0.358</b> <b>(0.188)<sup>c</sup></b>
Relative Role Model	0.991 (0.329)	1.414 (0.346)	<b>1.726</b> <b>(0.418)<sup>b</sup></b>	1.185 (0.368)	<b>2.176</b> <b>(0.891)<sup>b</sup></b>	1.055 (0.333)	1.253 (0.303)
Limited Liability	0.653 (0.213)	<b>1.554</b> <b>(0.370)<sup>c</sup></b>	0.902 (0.213)	0.841 (0.256)	1.050 (0.407)	1.512 (0.455)	1.133 (0.268)
Partnership	0.594 (0.220)	0.934 (0.249)	1.543 (0.411)	1.086 (0.358)	0.790 (0.375)	0.636 (0.248)	1.389 (0.359)
Degree	0.919 (0.271)	0.942 (0.210)	0.906 (0.200)	1.063 (0.297)	0.793 (0.291)	0.667 (0.193)	1.213 (0.261)
Exporter	0.879 (0.298)	0.902 (0.227)	<b>2.710</b> <b>(0.727)<sup>a</sup></b>	1.364 (0.414)	1.203 (0.477)	0.870 (0.281)	1.272 (0.315)
Innovator – Product	0.940 (0.466)	<b>1.403</b> <b>(0.045)<sup>a</sup></b>	1.300 (0.305)	<b>3.162</b> <b>(0.231)<sup>b</sup></b>	<b>8.405</b> <b>(0.303)<sup>b</sup></b>	<b>1.992</b> <b>(0.075)<sup>a</sup></b>	<b>2.005</b> <b>(0.080)<sup>a</sup></b>
Log likelihood	-182.09	-287.24	-292.14	-198.60	-127.35	-186.14	-294.62
Nagelkerke R <sup>2</sup>	0.088	0.111	0.089	0.098	0.153	0.132	0.083

Notes The Odds ratios are reported with the standard errors in parentheses. n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

**Table 7.13: Logit regression models of the probability of applying for external finance by source of finance.**

	Bank overdraft Model 1	Bank Loan ( $\geq 2$ years) Model 2	Bank Loan (< 2 years) Model 3	External Equity Model 4	Grants Model 5	Factoring/ Invoice Discounting Firms Model 6	Partners/ Working shareholders Model 7
Innovator – Product	0.940 (0.466)	<b>1.403</b> <b>(0.045)<sup>a</sup></b>	1.300 (0.305)	<b>3.162</b> <b>(0.231)<sup>b</sup></b>	<b>8.405</b> <b>(0.303)<sup>b</sup></b>	<b>1.992</b> <b>(0.075)<sup>a</sup></b>	<b>2.005</b> <b>(0.080)<sup>a</sup></b>
Log likelihood	-182.09	-287.24	-292.14	-198.60	-127.35	-186.14	-294.62
Nagelkerke R <sup>2</sup>	0.088	0.111	0.089	0.098	0.153	0.132	0.083
Innovator – Process	<b>1.795</b> <b>(0.505)<sup>b</sup></b>	<b>1.635</b> <b>(0.343)<sup>b</sup></b>	0.843 (0.178)	<b>1.859</b> <b>(0.485)<sup>b</sup></b>	<b>3.980</b> <b>(1.459)<sup>a</sup></b>	1.055 (0.283)	<b>2.428</b> <b>(0.513)<sup>a</sup></b>
Log likelihood	-180.90	-284.96	-292.29	-200.86	-126.75	-187.62	-286.28
Nagelkerke R <sup>2</sup>	0.104	0.121	0.088	0.082	0.158	0.120	0.129
Innovator – Work	<b>1.392</b> <b>(0.401)<sup>a</sup></b>	<b>2.273</b> <b>(0.487)<sup>a</sup></b>	0.768 (0.163)	<b>1.866</b> <b>(0.503)<sup>b</sup></b>	<b>2.945</b> <b>(1.083)<sup>a</sup></b>	1.287 (0.357)	<b>2.237</b> <b>(0.472)<sup>a</sup></b>
Log likelihood	-181.45	-280.13	-291.88	-201.05	-129.48	-187.50	-287.80
Nagelkerke R <sup>2</sup>	0.093	0.147	0.090	0.081	0.132	0.123	0.120
Innovator – Supply	<b>1.798</b> <b>(0.505)<sup>b</sup></b>	<b>3.359</b> <b>(0.721)<sup>a</sup></b>	<b>1.321</b> <b>(0.277)<sup>c</sup></b>	1.253 (0.326)	1.658 (0.563)	1.668 (0.450) <sup>c</sup>	<b>1.429</b> <b>(0.293)<sup>c</sup></b>
Log likelihood	-180.86	-270.80	-291.67	-203.40	-133.11	-186.15	-293.40
Nagelkerke R <sup>2</sup>	0.104	0.195	0.092	0.065	0.102	0.132	0.088
Innovator – Markets	1.131 (0.337)	1.205 (0.262)	<b>1.174</b> <b>(0.249)<sup>b</sup></b>	<b>2.208</b> <b>(0.664)<sup>a</sup></b>	1.864 (0.712)	1.465 (0.442)	<b>1.776</b> <b>(0.383)<sup>a</sup></b>
Log likelihood	-182.02	-287.20	-292.30	-200.05	-132.66	-187.12	-291.69
Nagelkerke R <sup>2</sup>	0.089	0.109	0.088	0.088	0.106	0.126	0.100
Innovator – Administration	<b>1.628</b> <b>(0.470)<sup>c</sup></b>	<b>1.326</b> <b>(0.288)<sup>c</sup></b>	0.912 (0.198)	<b>2.379</b> <b>(0.642)<sup>a</sup></b>	<b>1.813</b> <b>(0.640)<sup>c</sup></b>	1.353 (0.379)	<b>2.016</b> <b>(0.430)<sup>a</sup></b>
Log likelihood	-180.69	-286.70	-292.62	-198.52	-132.76	-187.35	-289.90
Nagelkerke R <sup>2</sup>	0.099	0.111	0.086	0.099	0.105	0.124	0.110
Innovator – Distribution	<b>2.354</b> <b>(0.657)<sup>a</sup></b>	<b>2.497</b> <b>(0.521)<sup>a</sup></b>	<b>1.242</b> <b>(0.255)<sup>a</sup></b>	1.416 (0.361)	<b>2.072</b> <b>(0.698)<sup>b</sup></b>	1.401 (0.373)	<b>1.455</b> <b>(0.294)<sup>c</sup></b>
Log likelihood	-177.32	-287.60	-291.94	-202.83	-131.75	-187.13	-293.43
Nagelkerke R <sup>2</sup>	0.124	0.160	0.090	0.069	0.114	0.126	0.090
R&D (1-2%)	0.842 (0.390)	<b>2.284</b> <b>(0.853)<sup>b</sup></b>	<b>3.626</b> <b>(1.250)<sup>a</sup></b>	<b>2.578</b> <b>(1.420)<sup>c</sup></b>	2.647 (2.129)	<b>3.790</b> <b>(2.539)<sup>b</sup></b>	1.281 (0.432)
R&D (3-5%)	0.708 (0.346)	<b>2.209</b> <b>(0.840)<sup>b</sup></b>	<b>3.360</b> <b>(1.190)<sup>a</sup></b>	<b>3.370</b> <b>(1.975)<sup>b</sup></b>	<b>4.000</b> <b>(3.172)<sup>c</sup></b>	<b>5.417</b> <b>(3.620)<sup>b</sup></b>	1.080 (0.378)
R&D (6-10%)	1.500 (0.752)	<b>3.291</b> <b>(1.375)<sup>a</sup></b>	<b>2.332</b> <b>(0.913)<sup>b</sup></b>	<b>3.311</b> <b>(2.072)<sup>c</sup></b>	3.802 (3.200)	<b>3.256</b> <b>(2.318)<sup>c</sup></b>	1.859 (0.717)
R&D (11-20%)	1.301 (0.800)	<b>2.604</b> <b>(1.310)<sup>c</sup></b>	<b>3.528</b> <b>(1.727)<sup>b</sup></b>	2.859 (2.045)	4.149 (3.883)	1.911 (1.628)	2.087 (0.996)
R&D ( $\geq 21\%$ )	<b>3.513</b> <b>(2.386)<sup>c</sup></b>	<b>10.910</b> <b>(0.512)<sup>a</sup></b>	2.124 (1.290)	<b>8.117</b> <b>(0.334)<sup>a</sup></b>	<b>9.894</b> <b>(1.069)<sup>a</sup></b>	1.660 (1.671)	1.591 (0.969)
Log likelihood	-187.94	-279.75	-284.12	-192.95	-130.93	-182.32	-292.78
Nagelkerke R <sup>2</sup>	0.119	0.149	0.132	0.136	0.122	0.158	0.093

Notes The Odds ratios are reported with the standard errors in parentheses. n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

### *Regression Results – Success, Reduced or Full Amount*

Maximum likelihood estimation models were again conducted with regard to the dichotomous dependent variable relating to a successful outcome – either the full or a reduced amount of finance received by the firms from a specific source. Table 7.14 presents the models where product innovation is included in addition to the firm and owner-manager's characteristics which have been also used throughout the dissertation. In Table 7.15 the condensed summary regression results are reported from re-running each of the models presented in Table 7.14 with each of the other seven measures of innovation.

The Nagelkerke  $R^2$  values for bank overdrafts range from 0.188 for the model including administration innovation to 0.298 for the model with product innovation. Healthy Nagelkerke  $R^2$  values are also found for long-term bank loans, external equity, grants, and factoring and invoice discounting firms. Lower Nagelkerke  $R^2$  values are found for short-term bank loans which ranged from 0.150 for the product, supply and also administration models in Table 7.15 to 0.182 in the model where R&D expenditure dummies were included. The lowest Nagelkerke  $R^2$  values were found for model 15 which dealt with partners and working shareholders. More specifically the models with process innovation, and also market innovation had Nagelkerke  $R^2$  values of 0.07. Each of the models was overall statistically significant at the 0.01 level and consequently those statistics are not additionally reported in the tables in save space.

The hypothesis H4 predicted that the innovative ventures would possess a greater likelihood of having been refused access to external finance in comparison to the non-innovating ventures. The logit models estimated in Tables 7.14 and 7.15 each have successful applications as the dependent variables so if the results were

consistent with hypothesis H4 we would expect the odds ratios on the innovation dummy variables to be less than one and to be statistically significant. However, in most instances where innovation is found to be statistically significant the magnitude of the innovation odds ratios was substantially greater than one. More specifically, in model 9 which dealt with bank overdrafts the product and also distribution innovation variables are both highly statistically significant at the 0.01 level, and the odds ratios were 7.9 and 8.6, respectively.

In model 10, which looks at the likelihood of success in applying for long-term bank loans the product, process and supply innovation variables were statistically significant at the 0.01, 0.10 and 0.01 levels, respectively. Again the odds ratios are all well above one. In contrast, for short-term bank finance only one innovation variable – distribution - was found to be weakly statistically significant at the 0.10 level.

Model 12 presented the results for applications for external equity and here, market innovators was statistically significant at the 0.01 level. The odds ratio for market innovators was 5.9, and again this magnitude is counter to our predictions. Again, the innovating firm has a higher probability of being successful in comparison to the non-innovating firms.

In model 13 the dependent variable was success in applications for grants. One measure of innovation – distribution innovation - was found to be statistically significant at the 0.05 level, and the odds ratio was 0.06 which is consistent with hypothesis H4. This was the sole example where a measure of innovation in the regression models was consistent with hypothesis H4.

In model 14 which was concerned with factoring or invoice discounting firms none of the measures of innovation were found to be statistically significant at the

0.10 level, or better. Lastly, model 15 reported the results for applying to partners or working shareholders. In mode 15 supply innovation and distribution innovation were found to be statistically significant at the 0.10 and 0.05 levels, respectively. The odds ratios were found to be 2.6 and 3.5 for supply and distribution innovation.

Thus, overall the regression results reported in Tables 7.14 and 7.15 found evidence which was not supportive of hypothesis H4 when the research is explored using a multivariate regression model.

Several of the control variables were found to be systematically statistically significantly related to the probability of being successful in applications for finance. Sector was found to be weakly statistically significantly related to the success of applications for long-term bank finance, while manufacturing firms were less likely to be successful than service sector firms in their applications for long-term bank finance. Indeed the odds ratio was 0.548.

The size of the firms was one of the most important variables in the models included in Table 7.14, and was positively statistically significant at the 0.10 level or better in models for short-term bank finance, external equity, factoring or invoice discounting firms and partners or working shareholders. Thus, larger sized firms are more likely to be successful in their applications for 4 out of the 7 sources explored in Table 7.14. Larger sized firms would be expected to have a greater amount of resources and a stronger presence than smaller sized firms,

The age of the firms was only weakly statistically significant at the 0.10 level in one model which was related to the success of long-term bank finance. Thus, on the whole, the age of the firms does not appear to matter when decisions are being made by the external funding decision makers in response to requests for capital.

The family business was found to be an important variable in two models, relating to grants and factor or invoice discounting firms, and was statistically significant at the 0.01 and 0.10 levels, respectively. Family businesses were less likely than non-family businesses to be successful in applications for grants. However, the opposite was the case for factoring or invoice discounting firms – where the odds ratio of family businesses being successful was 2.7.

Interestingly the gender of the owner-manager was not statistically significant in any of the models shown in Table 7.14. Thus, whether the applicant is a man or a woman has no statistically significant bearing upon the likelihood of the external funding source being more inclined, or less likely, to provide the full or the reduced amount of funding requested across the seven sources of finance which have been explored.

Instead it was the age of the owner-managers which was found to be the most important characteristic in helping to explain the probability of firms being successful in their applications for external finance. The age of the owner-manager was found to be statistically significant at the 0.01 level in the models of long-term bank finance, and factoring or invoice discounting firms, whilst in the models of short-term bank finance and grants the age of the owner-managers was weakly statistically significant at the 0.10 level. In all four models which were statistically significant at the 0.10 level, or better, the age of the owner-managers was positively related to a successful application for finance. As discussed before, older owner-managers are more experienced and have a much more solid and widespread networking base to consult, so that both the information flow and resources flow for their businesses are enhanced. Moreover, experienced Chinese entrepreneurs prefer long-term to short-term loans, in fact approved bank loans that are backed by a guarantee company are typically lent

for 5 to 10 years. Longer term loans typically require a lower cost of capital and offer better controllability and certainty to the recipient. However, the overdraft facilities are very convenient for experienced entrepreneurs to manage their cash flow and quickly carry out transactions of smaller amounts when necessary.

Having a relative role model was found to be negatively related to successful applications for long-term bank loans, and to factoring or invoice discounting firms at the 0.01 level in both cases. A relative role model is often a member of the family, thus the owner-manager's family is also very likely to be involved in business. In this case, financial support to the new starter is more likely to be available from family members very cheaply. Therefore, the firm will be less financially constrained and the successfulness of loan applications will not be as crucial to entrepreneurs who have family ties in the business context, as these external financiers tend not to be the entrepreneur's last source of access to finance.

In the multivariate regression models, the legal status of the firms was found to not be an important variable and was not statistically significant in any of the models, with one exception. It is then fair to say that the legal status of a firm does not influence the success of gaining access to finance in China. The choice of which corporation business vehicle to use is more directed by different tax treatments of each form of cooperation rather than considerations of access to finance.

Having a degree was found to be important in two models – successful applications for bank overdrafts, and short-term bank loans, where the degree variable was statistically significant at the 0.05 level in both models. Interestingly, those with degrees were less likely to be successful in applications for bank overdrafts, but were more likely to have success in their applications for short-term bank loans, compared to those without degrees. One possible explanation for this result is that better

educated owner-managers are more capable of drafting a presentable business plan to the loan officer; however they may lack negotiation skills when it comes to overdraft account applications which are not normally based on written documents. Thus the providers of external finance do not appear to be swayed one way or the other in most cases for most sources of finance.

The exporting variable was found to be statistically significant at the 0.05 level in one model relating to factoring or invoice discounting firms. Exporters were less likely to be successful compared to the non-exporters in their applications for finance from factoring or invoice discounting firms. Clearly, the perception of the factoring or invoice discounting firms is that the exporters by virtue of operating in markets beyond China carry an extra risk. However, without recording the overall number of applications made by exporters vs. non-exporters, and the proportion of the applications that were successful, it is not possible to give a conclusive judgement to the cause of this result.

**Table 7.14: Logit regression models of successful applications for external finance by source**

	Bank overdraft Model 9	Bank Loan ( $\geq$ 2 years) Model 10	Bank Loan (< 2 years) Model 11	External Equity Model 12	Grants Model 13	Factoring/ Invoice Discounting Firms Model 14	Partners/ Working shareholders Model 15
Sector	3.027 (0.879)	<b>0.548</b> <b>(0.200)<sup>c</sup></b>	1.186 (0.399)	0.238 (0.876)	0.886 (0.817)	1.140 (0.578)	0.966 (0.445)
Size	0.886 (0.371)	1.981 (1.400)	<b>1.848</b> <b>(0.393)<sup>a</sup></b>	<b>1.737</b> <b>(0.549)<sup>c</sup></b>	0.704 (0.302)	<b>1.474</b> <b>(0.836)<sup>b</sup></b>	<b>1.688</b> <b>(0.480)<sup>c</sup></b>
Age of Business	1.110 (0.970)	<b>1.667</b> <b>(0.502)<sup>c</sup></b>	0.801 (0.233)	1.723 (0.793)	0.855 (0.445)	0.916 (0.516)	0.997 (0.388)
Family Business	0.482 (0.537)	0.692 (0.286)	0.851 (0.342)	0.961 (0.613)	<b>0.385</b> <b>(0.043)<sup>a</sup></b>	<b>2.693</b> <b>(1.176)<sup>c</sup></b>	1.044 (0.564)
Gender	1.356 (1.438)	0.751 (0.308)	0.959 (0.384)	0.401 (0.283)	0.884 (0.913)	0.615 (0.507)	1.104 (0.603)
Age of Owner-Manager	1.920 (0.044)	<b>4.663</b> <b>(0.071)<sup>a</sup></b>	<b>3.480</b> <b>(2.543)<sup>c</sup></b>	0.688 (0.809)	<b>2.111</b> <b>(0.130)<sup>c</sup></b>	<b>3.999</b> <b>(0.356)<sup>a</sup></b>	3.554 (0.442)
Relative Role Model	2.316 (1.467)	<b>0.541</b> <b>(0.022)<sup>a</sup></b>	1.394 (0.565)	0.402 (0.305)	0.899 (0.449)	<b>0.135</b> <b>(0.092)<sup>a</sup></b>	0.889 (0.504)
Limited Liability	0.245 (0.298)	1.276 (0.496)	0.863 (0.331)	0.618 (0.445)	1.229 (0.877)	0.670 (0.483)	1.597 (0.938)
Partnership	<b>3.717</b> <b>(0.269)<sup>a</sup></b>	1.400 (0.642)	1.667 (0.740)	0.917 (0.706)	0.908 (0.667)	0.440 (0.410)	1.684 (1.075)
Degree	<b>0.093</b> <b>(0.108)<sup>b</sup></b>	0.991 (0.366)	<b>2.490</b> <b>(0.915)<sup>b</sup></b>	0.578 (0.375)	2.001 (0.855)	0.977 (0.670)	0.995 (0.478)
Exporter	1.153 (1.273)	0.813 (0.333)	1.231 (0.505)	2.802 (2.087)	1.076 (0.545)	<b>0.330</b> <b>(0.144)<sup>b</sup></b>	0.886 (0.483)
Innovator – Product	<b>7.866</b> <b>(0.156)<sup>a</sup></b>	<b>2.636</b> <b>(0.149)<sup>a</sup></b>	0.903 (0.348)	4.507 (2.818)	0.156 (1.223)	0.543 (0.589)	0.666 (0.401)
Log likelihood	-142.47	-216.58	-245.13	-184.05	-150.46	-182.30	-126.04
Nagelkerke R <sup>2</sup>	0.298	0.254	0.150	0.231	0.251	0.213	0.073
n	67	186	56	81	44	76	195

Notes The Odds ratios are reported with the standard errors in parentheses. n=452 <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

**Table 7.15: Logit regression models of successful applications (full or reduced) for external finance by source**

	Bank overdraft Model 9	Bank Loan ( $\geq 2$ years) Model 10	Bank Loan (< 2 years) Model 11	External Equity Model 12	Grants Model 13	Factoring/ Invoice Discounting Firms Model 14	Partners/ Working shareholders Model 15
Innovator – Product	<b>7.866</b> ( <b>0.156</b> ) <sup>a</sup>	<b>2.636</b> ( <b>0.149</b> ) <sup>a</sup>	0.903 (0.348)	4.507 (2.818)	0.156 (1.223)	0.543 (0.589)	0.666 (0.401)
Log likelihood	-142.47	-216.58	-245.13	-184.05	-150.46	-182.30	-126.04
Nagelkerke R <sup>2</sup>	0.298	0.254	0.150	0.231	0.251	0.213	0.073
Innovator – Process	2.297 (1.806)	<b>1.827</b> ( <b>0.649</b> ) <sup>c</sup>	0.617 (0.209)	0.561 (0.338)	1.077 (1.034)	0.970 (0.600)	0.813 (0.399)
Log likelihood	-156.90	-219.70	-243.19	-185.18	-152.06	-182.36	-126.37
Nagelkerke R <sup>2</sup>	0.196	0.236	0.161	0.215	0.211	0.212	0.070
Innovator – Work	2.206 (1.832)	1.220 (0.437)	0.824 (0.294)	1.348 (0.821)	1.618 (1.709)	0.712 (0.507)	0.701 (0.375)
Log likelihood	-156.39	-221.62	-245.02	-185.44	-151.80	-182.34	-126.10
Nagelkerke R <sup>2</sup>	0.200	0.224	0.151	0.211	0.217	0.212	0.073
Innovator – Supply	2.195 (1.860)	<b>3.019</b> ( <b>1.098</b> ) <sup>a</sup>	0.967 (0.334)	1.117 (0.635)	0.400 (0.336)	1.266 (0.909)	<b>2.559</b> ( <b>1.368</b> ) <sup>c</sup>
Log likelihood	-156.51	-213.16	-245.21	-185.61	-150.86	-181.13	-123.21
Nagelkerke R <sup>2</sup>	0.200	0.274	0.150	0.208	0.241	0.231	0.101
Innovator – Markets	2.477 (2.238)	1.278 (0.466)	0.716 (0.253)	<b>5.939</b> ( <b>0.311</b> ) <sup>a</sup>	0.229 (0.247)	0.524 (0.409)	0.802 (0.453)
Log likelihood	-157.32	-221.53	-244.42	-178.52	-150.84	-181.67	-126.40
Nagelkerke R <sup>2</sup>	0.193	0.225	0.154	0.310	0.242	0.223	0.070
Innovator – Administration	1.788 (1.582)	1.375 (0.489)	0.916 (0.331)	1.191 (0.745)	0.508 (0.551)	1.146 (0.806)	2.238 (1.164)
Log likelihood	-157.75	-221.25	-245.19	-185.52	-151.87	-182.39	-124.04
Nagelkerke R <sup>2</sup>	0.188	0.226	0.150	0.210	0.216	0.211	0.093
Innovator – Distribution	<b>8.642</b> ( <b>0.789</b> ) <sup>a</sup>	1.688 (0.589)	<b>1.867</b> ( <b>0.650</b> ) <sup>c</sup>	0.437 (0.276)	<b>0.060</b> ( <b>0.067</b> ) <sup>b</sup>	1.272 (0.840)	<b>3.448</b> ( <b>2.020</b> ) <sup>b</sup>
Log likelihood	-151.96	-219.82	-241.52	-183.84	-144.46	-182.38	-121.57
Nagelkerke R <sup>2</sup>	0.234	0.235	0.170	0.235	0.291	0.212	0.117
R&D (1-2%)	1.784 (3.104)	0.971 (0.668)	1.121 (0.704)	0.065 (0.103)	1.113 (0.887)	0.885 (0.766)	0.801 (0.729)
R&D (3-5%)	1.909 (3.435)	2.403 (1.685)	0.721 (0.456)	0.383 (0.540)	0.889 (0.765)	0.808 (0.665)	0.522 (0.470)
R&D (6-10%)	<b>2.299</b> ( <b>2.160</b> ) <sup>b</sup>	<b>5.053</b> ( <b>3.845</b> ) <sup>b</sup>	3.087 (2.600)	0.068 (0.115)	0.553 (0.532)	0.907 (0.812)	0.543 (0.555)
R&D (11-20%)	<b>4.015</b> ( <b>2.511</b> ) <sup>b</sup>	3.244 (2.856)	1.993 (1.916)	0.543 (0.871)	0.664 (0.543)	0.442 (0.397)	1.282 (1.709)
R&D ( $\geq 21\%$ )	1.747 (3.977)	1.804 (1.580)	0.831 (0.896)	0.194 (0.331)	0.885 (0.743)	0.745 (0.699)	0.941 (1.011)
Log likelihood	-153.69	-208.65	-239.14	-178.69	-145.95	-174.00	-123.13
Nagelkerke R <sup>2</sup>	0.221	0.299	0.182	0.308	0.301	0.236	0.102
n	67	186	56	81	44	76	195

Notes The Odds ratios are reported with the standard errors in parentheses. <sup>c</sup> p < 0.10;  
<sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

### *Awareness of Sources of External Finance*

The bivariate analysis had found that several of the characteristics of the owner managers and the firms were statistically significant at the 0.10 level or better with regard to the seven sources of finance, albeit less than were found in the models of applications for finance, and successful applications for finance, by source. For two of the sources of finance – long-term and short-term finance - the levels of awareness were approaching 100% which rendered multivariate regression analysis impractical. Accordingly, in Table 7.16 the odds ratios are presented from the multivariate regression models of five sources of finance, rather than the seven sources which have been explored in the previous regression sections of the chapter.

The most striking feature of Table 7.16 is the very few instances where the characteristics of the owner-managers or the businesses were statistically significant at the 0.10 level, or better, related to the probability of the firms being aware of the sources of finance. Table 7.16 presents the result with product innovation included as the measure of innovation. Product innovation was not statistically significant at the 0.10 level or better in any of the models. When product innovation was replaced in turn with each of the other types of innovation, none of the measures of innovation were found to be statistically significant. Accordingly, the view was taken not to report the tabulation of the odds ratios of the other measures of innovation as there are no statistically significant relationships. Thus, the results in the multivariate regression models show that whether or not a firm is an innovator, is not systematically related to the firms being aware of risk capital sources, or any of the other sources of finance. Thus, the regression results present evidence which is not supportive of hypothesis H5.

Instead it was the control variables which were found to be more important variables in explaining awareness of sources of finance. Larger sized firms were more likely than smaller sized firms to be aware of factoring or invoice discounting firms, and also partners or working shareholders, and these relationships were both weakly statistically significant at the 0.10 level. It is intuitive to realise that in general more opportunities are available to larger firms thus the owner-managers are expected to be more experienced in more fields and circumstances than owner-managers of smaller firms. The level of awareness is partly determined by the level of experience and knowledge of business of the entrepreneur.

Family businesses were less likely than non-family businesses to be aware of factoring or invoice discounting firms, and again this relationship was also only weakly statistically significant at the 0.10 level.

Whether the firm was in the manufacturing or service sector, the age of the business, and whether or not the firm exported goods and services were not statistically significant at the 0.10 level or better. Neither were the characteristics of the owner-managers – gender, age, having a relative role model, or possessing a degree. Despite these findings, it does not necessarily lead to the belief these factors are not relevant to the level of awareness of external sources of finance. Because of the limitations of this research project and the fact this is only an exploratory study, it is more prudent to seek more evidence in further researches in this area before adding comments and possible explanations.

**Table 7.16: Logit regression models of awareness of external finance by source  
The Odds Ratios**

	Bank overdraft Model 16	External Equity Model 17	Grants Model 18	Factoring/ Invoice Discounting Firms Model 19	Partners/ Working shareholders Model 20
Sector	1.452 (0.395)	1.057 (0.219)	1.396 (0.320)	1.308 (0.310)	1.052 (0.485)
Size	0.862 (0.128)	1.098 (0.127)	1.026 (0.131)	<b>1.278</b> <b>(0.176)<sup>c</sup></b>	<b>1.597</b> <b>(0.430)<sup>c</sup></b>
Age of Business	1.680 (0.369)	0.847 (0.144)	0.977 (0.183)	1.141 (0.223)	<b>0.496</b> <b>(0.193)<sup>c</sup></b>
Family Business	1.337 (0.422)	0.831 (0.197)	0.983 (0.259)	<b>0.624</b> <b>(0.170)<sup>c</sup></b>	0.995 (0.539)
Gender	0.709 (0.238)	1.149 (0.283)	0.705 (0.202)	1.047 (0.293)	0.510 (0.329)
Age of Owner-Manager	1.027 (0.720)	1.013 (0.531)	1.651 (0.961)	0.803 (0.487)	2.285 (2.516)
Relative Role Model	1.316 (0.429)	1.197 (0.286)	0.974 (0.258)	1.457 (0.405)	0.592 (0.308)
Limited Liability	<b>1.770</b> <b>(0.560)<sup>c</sup></b>	0.858 (0.201)	1.051 (0.273)	1.148 (0.311)	0.562 (0.276)
Partnership	<b>1.792</b> <b>(0.599)<sup>c</sup></b>	1.391 (0.370)	1.386 (0.409)	1.310 (0.400)	0.965 (0.574)
Degree	1.342 (0.382)	1.363 (0.299)	0.996 (0.241)	1.061 (0.269)	1.718 (0.891)
Exporter	0.773 (0.243)	1.451 (0.373)	1.110 (0.312)	<b>0.933</b> <b>(0.272)</b>	0.666 (0.359)
Innovator – Product	0.751 (0.243)	1.427 (0.332)	1.281 (0.330)	0.964 (0.260)	0.752 (0.389)
Log likelihood	-193.56	-292.09	-251.58	-236.75	-87.45
Nagelkerke R <sup>2</sup>	0.229	0.312	0.319	0.287	0.154

Notes: N=452 in all models. The Odds ratios are reported with the standard errors in parentheses. <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

## 7.6 Conclusion

This chapter has investigated the funding environment of innovative and non-innovative firms in the Beijing area of China and has tested three hypotheses. Craig et al (2008, P 346) argued that “[a] particular area of concern for policymakers is whether small businesses have access to adequate credit” and this credit is necessary

to fuel and sustain growth and development. The evidence was consistent with the first hypothesis that was tested in the chapter, H3, that innovative ventures are more likely to have applied for external finance than non-innovators.

The strength of the findings was clear from both the cross-tabulation analysis and also the multivariate logit models, and across all the sources of finance. This was reinforced by the result that 10.81% of product innovators and 26.89% of non-product innovators had made no external applications for finance. In other words, nine out of ten product innovators had made one or more application for finance, and approximately three out of four of the non-product innovators had made one or more application for external finance.

The analysis of the multivariate regression models showed that innovation was not the only characteristic of the firms or the owner-managers which was related to applying for external finance. In general, applications for external finance was positively related to larger and older firms, exporters, and negatively related to owner-managers' age and it being a family business. Thus, cultural concerns and the desire to maintain control of firms without the necessity to reveal detailed financial information to external sources still represents a barrier which needs to be overcome.

In contrast to the first hypothesis, H3, the results were not very supportive of the second hypothesis, H4, which was tested in the chapter. However, given that innovators were more likely to be successful in securing finance from banks, either in the form of bank overdrafts or longer term bank loans, this has clear implications for policy. Given the need for the Chinese government to prolong the period of economic advancement and development, there is a need to harness the resources and the potential of innovative firms, and the results suggest that the banks are surprisingly receptive to innovative ventures. Instead the results and the strong positive

relationships between the age of the owner-managers and also the size of the firms with the probability of submitting successful applications and receiving either the full or the reduced amount, suggest that the banks need to be encouraged to overhaul their appraisal systems and their criteria, and given the relationship of the Chinese government to the banks this is possible. Clearly, the younger owner-managers and those running the smaller sized firms are adversely placed in comparison to the older owner-managers and the larger sized firms.

Normally, state-owned commercial banks only release loans for enterprises with at least an AA rating, which is almost impossible for the majority of small and medium sized enterprises. In addition, some state-owned banks even stipulate that they will not consider a loan application for less than 3 million Yuan which far exceeds the amount that small and medium sized enterprises generally need. A nationwide credit assessment system especially for small and medium sized enterprises was proposed in 2001 without much constructive action having taken place up to that point. A clear intention to improve the information processing and transmission of the credit situation of small and medium sized enterprises from the authorities is promising. Hopefully, forward-looking owner-managers will see the incentive of building a sound credit reputation for its positive influence on future borrowings from the formal banking system.

Chen (2002) showed that loans granted in the first half of 2000 by banks in Leqing County in Zhejiang Province, of which 91.4 percent of loans totalling 478 million Yuan were short-term loans (less than one year). In Mei and Tan's (2002) book, the authors summarised the proportion of working capital to fixed assets among loans to SMEs provided by some banks in Shanghai were as follows: Industrial and Commercial Bank – 82:18; Communications Bank – 95:5; Pudong Development

Bank – 80:20; City Cooperative Bank – 92:8. In addition, 60 percent of total loans are limited to six months. Previous empirical research reached a significant conclusion that the loan structure for Chinese SMEs was mainly concentrated on working capital loans, therefore short-term rather than long-term (Wang 2004). Yet, it does not say that SMEs do not need long-term capital for fixed asset investment to enhance growth. So, further investigation from the owner-managers' side is essential.

The evidence in the cross-tabulations compared to the regression models provided a contrasting picture of support for the third hypothesis, H5. The cross-tabulation analysis found that for equity finance, the awareness of these sources was statistically related to innovation activity – product, process, supply, administration and distribution. In the regression models there was no statistically significant difference between innovators and non-innovators in their awareness of equity finance and this evidence is not supportive of hypothesis H5.

Colombo and Grilli (2007, P25) indicated that “as it has long been recognized in the economic literature, capital markets are a driving force for economic development.” In China the capital markets are slowly evolving, but for all sources of external finance the lack of information transparency is an inherent disease of Chinese firms which needs to be overcome. This lack of information transparency is directly related to their treatment by the tax system, and indeed reflects the background of certain groups of owner-managers. There are restrictions in the registration under different forms of incorporation (Garcia-Fontes, 2005). Thus, misrepresentation of cash-flows, depreciation and stock valuation happens all the time. It is a common practice of owner-managers to keep several sets of accounts for different purposes (i.e. one for the taxman, one for bankers and one for themselves). For every reason, outsiders will not trust firms' published materials for monetary decisions. The

information problem makes both debt and equity financing extremely challenging to SMEs. But equally the disadvantage of publishing the true and fair view of the firm will obviously outweigh the advantage they gain in the financial market, otherwise, a collective movement of owner-managers to reveal firms' real performance would have happened under finance pressures.

## **Chapter 8:**

### **The Financing of Small Firms in Beijing, China: Exploring the Extent of Credit Constraints**

#### **8.1. Introduction**

Small and medium sized enterprises (SMEs) are frequently viewed as an engine of economic growth, job creation and greater prosperity (Wennekers and Thurik, 1999; Reynolds et al., 1994). The innovative capability of SMEs is seen as a crucial driver of sustainable competitive advantage (Nieto and Santamaria, 2010) and though much of the evidence for this is drawn from the industrialised economies of North America and Europe, it is thought to hold for developing as well as developed economies. A call for more research on entrepreneurship and small business in China has been made by Li and Matlay (2006). In China, policy towards SMEs has developed in line with the growing importance of SMEs to the Chinese economy (China Private Enterprises Year Book 2004-2006, Wang and Gu, 2005)<sup>6</sup>. Recent estimates suggest that SMEs are now responsible for approximately 75% of the workforce in cities and towns (US Embassy Report 2002; Hussain et al 2006) and 75% of new jobs (Zou, 2006). In Beijing, the focus of this study, approximately 965,773 private enterprises were registered in the city as of June 2006 - representing 82.92% of all firms. Excluding micro firms, 278,918 SMEs represents the population of SMEs in Beijing (China Private Enterprises Year Book 2004-2006 p. 210, p.217). The Chinese government recognises that a vibrant SME sector has become central to the expansion and stability of the economy (Beijing Development and Reform Commission, SME Office, 2007; Jia, 2006). Currently, policy seems aimed at

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<sup>6</sup> Song (2006) estimated that, by the end of 2005, there were in excess of 42 million SMEs in China.

promoting SMEs in selected niche sectors as a means of developing supply chains and, through this, supporting existing large firms (Ning, 2007).<sup>7</sup> In many respects, this is a *volte-face* from the policies adopted in the late 1950s, during the Great Leap Forward, and again in the 1960s and 1970s as part of the Cultural Revolution, which saw widespread appropriation of private sector resources by the State.

As SMEs become the increasing focus of Chinese industrial policy, so discussions on access to finance become common. In the rhetoric of western political and academic debate, access to external finance is typically identified as the major constraint to small firm's growth and development (Blumberg and Letterie, 2008). In standard accounts, banks assign high-risk status to small firms' credit proposals and, accordingly, make fewer loans at the margin. Often, small firms propose investment projects that are difficult for financial institutions to evaluate and monitor, and are led by entrepreneurs with short, or egregious, credit histories and limited collateral. Under these circumstances, banks minimize problems of adverse selection and moral hazard by rationing credit on some basis other than price.

Though this argument is most commonly made with reference to developed economies, it has also been made within emerging or transitional economies such as China (Chow and Fung, 2000). However, in both contexts, the evidence for widespread rationing of credit to small firms is, at best, scant. For instance, Oakey (2007, p. 224) suggests that "there appears to be a growing consensus that overall, the United Kingdom capital market for SMEs functions adequately". However, he also notes that "there persists a sentiment that particular niches of the demand side of this market are not operating efficiently". Possible gaps are believed to exist in the financing of early stage technology firms specifically, and in innovative firms more

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<sup>7</sup> The Small and Medium Size Firm Promotion Law of the People Republic of China promulgated at the 9<sup>th</sup> Standing Committee Meeting of the National People's Congress, 29 June 2002. See Ning 2007.

generally (SBS 2004/05). It is not difficult to imagine why such firms encounter problems: evidence has long shown that the returns on inventions are highly skewed, with failure a common outcome. Indeed, one recent study of Canadian independent inventors (Åstebro, 2003) found that 93% of inventive projects failed to reach the market and, of the small percentage which did reach the market, only 40% achieved positive returns.

Consequently, the focus of this chapter is both broad and narrow. Broadly, and given limited evidence on the extent of financial constraints faced by small firms in developing economies, the objective is to investigate the demand and supply of credit using a sample of 384 SMEs (which applied for external finance) in Beijing, China. Practically, we explore variations in entrepreneur and firm-level characteristics by: (i) the amount of external finance sought, (ii) the amount of external finance received, and (iii) the ratio of 'sought' to 'received' external finance. In this way, our research questions are concerned with understanding which 'types' of firms seek most bank finance, and which are most successful.

More narrowly, and to pursue this broad agenda, we place particular emphasis upon the role of innovation in decisions on borrowing and lending. Here, we are able to take a wider view of innovation than is common in similarly motivated and designed studies. Whilst many scholars of innovation and entrepreneurship are happy to identify the influence of Joseph Schumpeter (in particular his 1912 *Theory of Economic Development*), many appear content with a narrower technical product and process conception of innovation than appeared in this classic work. Such 'technicalist' views of innovation are likely to leave much innovation activity 'hidden' (NESTA, 2006) and serve to inappropriately set aside large parts of most economies, such as many service activities (including those within manufacturing

firms). Accordingly, the researcher's study was designed to allow a more comprehensive reckoning, one which is more faithful to Schumpeter's earlier work. To this end, innovations may be in: (i) products, (ii) processes, (iii) work practices or workforce organisation, (iv) supply and supplier relations, (v) markets and marketing, (vi) administration and office systems, and (vii) product distribution. These various domains of innovation are likely to signal varying degrees of technical, market and, ultimately, financial uncertainty and risk. An earlier version of this chapter was presented at the 2010 INBAM conference (See Robson et al., 2008b). Only 16 papers were selected for the Small Business Economics stream of the INBAM conference. The conference paper has subsequently been revised and it is one of only 7 papers being taken forward for consideration for publication in Small Business Economics (Wang et al. 2010) (See Appendix 8.1 for the short-listing letter).

The reader is reminded that this chapter is focusing upon firms who are seeking finance (384 firms), rather than the full sample which was analysed in chapter six (452 firms). Appendix 8.2 and 8.3 show the industry group of the 384 firms analysed in this chapter, and the mean summary statistics. The reader is also reminded that the following hypotheses which had been developed in the front-half of the dissertation are tested in this chapter.

*H6:* The innovative ventures will have a lower percentage of money received from that sought compared to the non-innovating ventures.

*H7:* The innovative ventures' amount of money sought will be higher than that sought by non-innovating ventures.

*H8*: The innovative ventures' amount of external finance obtained will be lower than the corresponding value for non-innovating ventures.

The chapter is structured as follows: Section two introduces the empirical findings at the general level. Section three presents the bivariate analysis between the innovation and control characteristics of the businesses and entrepreneurs against our three sets of access to finance measures. Section four shows the multivariate regression analysis – tobit regression models of the percentage of finance received from that sought, and OLS regression models of the amount of money sought, and the amount of money received. Section five presents a discussion of the analysis and the key findings. Finally, in section six a conclusion completes the chapter

## **8.2 Empirical Findings**

This section provides an overview of the overall general results of: (1) the percentage of the money received from that sought, (2) the amount of money sought, and (3) the amount of money obtained. Each of these three access to finance issues is examined in turn at a general level before the cross-tabulation analysis compares the aforementioned with whether or not the firms were innovators and other characteristics of the entrepreneurs and their businesses. The hypotheses are tested in relation to the cross-tabulations and, later in the chapter, in a multivariate regression context.

### **8.2.1 Descriptive statistics results**

Initially, in order to have a better feel and understanding of: (1) the percentage of the money received from that sought, (2) the amount of money sought, and (3) the amount of money obtained, a set of descriptive statistics – means and standard deviations - are reported.

Overall, on average the firms seeking external finance received 65.86% of the finance which they were seeking. Thus, firms on average received approximately two thirds of the finance which they seek. The average amount of external finance sought was 951,892 yuan which approximates to \$126,792 (based on an exchange rate of 1 yuan = \$0.1332, calculated at October 1<sup>st</sup> 2007). The average amount of external finance received was 579,044 yuan which approximates to \$77,129.

The three main aspects of finance were then tested against the innovation measures which form the centre of the hypothesis testing, together with the control variables of the other characteristics of the businesses and the owner-managers, for which it would be logical to expect possible relationships.

## **8.3 Crosstabulation Analysis**

### **8.3.1 Crosstabulation analysis – the percentage of the money received from that sought**

Overall, on average the firms seeking external finance received 65.86% of the finance which they were seeking (Table 8.1). For the seven types of innovation there were no statistically significant differences between the percentage of the money received and that sought. However, R&D expenditure was highly statistically related to the proportion of external finance received from that sought. This relationship was

statistically significant at the 0.01 level. Firms which spent zero money on R&D received 76.67% of the finance which they sought which was substantially more than the 62.15% for firms with 1-2% R&D expenditure levels, which in turn was well above the 53.24% reported for firms with the highest levels of R&D expenditure. Thus, the evidence is not supportive of hypothesis H6 that innovating firms would receive a smaller proportion of the finance sought than the non-innovating businesses.

Several of the control variables were statistically significantly related to the proportion of the finance received from that sought. Sector, type of business and exporting activity were shown to be statistically significantly related to the proportion of external finance received from that sought. Manufacturing firms received 67.7% of the finance which they sought which was more than the 63.2% obtained by service sector firms and this relationship was weakly statistically significant at the 10% level. Registered businesses received 62.6% of the finance sought which was less than the 67.8% reported by partnerships, and 68.7% acquired by limited liability businesses. This relationship was weakly statistically significant at the 0.10 level. The non-exporters received 67.6% of the finance sought compared to the 61.5% reported by exporters and this was statistically significant at the 0.05 level.

**Table 8.1: Descriptive statistics and ANOVAs – the percentage of external finance which was obtained, by those businesses seeking external finance.**

	Mean	S.D	N	F	df
All	65.86	25.120	384		
Sector - Manufacturing	<b>67.700</b>	23.965	224	<b>2.87<sup>c</sup></b>	1
Services	<b>63.288</b>	26.740	160		
8-19 employees	67.48	28.080	136	0.962	4
20-49 employees	64.66	22.570	115		
50-99 employees	65.36	25.448	70		
100-199 employees	69.55	25.575	38		
200-499 employees	58.40	17.954	25		
1-5 years old	67.90	25.184	154	0.832	2
6-9 years old	64.58	25.683	144		
≥10 years old	64.36	24.533	86		
Family Business	64.764	24.339	178	0.63	1
Non Family Business	66.811	25.977	206		
Gender – Male	65.460	25.106	300	0.35	1
Female	67.298	25.718	84		
18-30 years old	62.45	27.356	44	1.124	
31-45 years old	65.54	25.058	246		
46-55 years old	66.51	24.419	73		
≥56 years old	74.52	24.995	21		
Relative Role Model	64.807	24.436	140	0.38	1
No Relative Role Model	66.467	25.687	244		
Registered Business	<b>62.615</b>	25.906	166	<b>2.48<sup>c</sup></b>	2
Partnership	<b>67.784</b>	24.317	88		
Limited liability	<b>68.710</b>	24.633	130		
Degree	64.846	25.254	189	0.60	1
No Degree	66.846	25.210	195		
Exporter	<b>61.449</b>	25.753	107	<b>4.59<sup>b</sup></b>	2
Non-Exporter	<b>67.567</b>	24.847	277		
Innovator – Product	64.754	25.034	297	2.54	1
None	69.644	25.626	87		
Innovator – Process	65.417	25.444	156	0.08	1
None	66.168	25.115	228		
Innovator – Work	65.108	25.939	186	0.32	1
None	66.571	24.568	198		
Innovator – Supply	65.248	24.164	165	0.17	1
None	66.324	26.031	219		
Innovator – Markets	64.942	25.452	242	0.87	1
None	67.430	24.828	142		
Innovator – Administration	65.356	23.952	163	0.11	1
None	66.235	26.161	221		
Innovator – Distribution	67.431	24.068	167	1.14	1
None	64.654	26.061	217		
R&D Expenditure as a % of turnover: None	<b>76.67</b>	29.148	42	<b>19.443<sup>a</sup></b>	5
1-2%	<b>62.15</b>	24.464	134		
3-5%	<b>66.28</b>	25.690	100		
6-10%	<b>68.83</b>	23.259	60		
11-20%	<b>67.10</b>	20.647	31		
≥21%	<b>53.24</b>	23.779	17		

### **8.3.2 Crosstabulation analysis – the amount of money sought**

In Table 8.2 it can be seen that the average amount of external finance sought was 951,892 yuan which approximately equates to \$126,792. The ANOVA results for the seven types of innovation show that it is clear that innovators sought substantially more money than non-innovators and that this was statistically significant at the 5% level or better in all cases with the exception of product innovation. Looking in greater detail, the results show that the process innovators and distribution innovators sought 60% and 66% more finance, respectively, than their non-innovating counterparts. However, for work, supply, markets and administration innovation the innovators sought more than double the external finance compared to the corresponding non-innovators. Looking at the input measure of innovation – the R&D expenditure as a proportion of turnover - it is clear that firms with 6-10% of expenditure on R&D sought the most money but there was no evidence of a statistically significant relationship.

Thus, overall the results of the bivariate analysis are very supportive of the hypothesis H7 that the innovating businesses would seek more finance than their non-innovating business counterparts.

Looking at the control variables it is clear that within the characteristics of the businesses only two sets of variables were statistically significant at the 5% level – sector and exporting (Table 8.2). Manufacturing businesses sought less finance than their service sector counterparts. Exporters sought more finance than the non-exporters, by a magnitude approaching 50%.

With regard to the control variables relating to the characteristics of the entrepreneurs, two variables were found to be statistically significant. Possessing a degree was weakly statistically significant at the 10% level, and the age of the

entrepreneur was highly statistically significant at the 0.01 level. Those entrepreneurs with degrees sought substantially more money than those without degrees. The two youngest age groups of entrepreneurs – those aged 18-30 and 31-45 years old - sought substantially more finance than the two older age groups of entrepreneurs aged 46-55 and  $\geq 56$  years old.

**Table 8.2: Descriptive statistics and ANOVAs – the amount of external finance which was sought, by those businesses seeking external finance. (NB: Values are for per 1,000)**

	Mean	S.D	n	F	df
<b>All</b>	951.892	2043.449	384		
Manufacturing	779.689	1780.525	224	<b>5.03<sup>b</sup></b>	1
Services	1192.975	2347.720	160		
8-19 employees	434.048	1292.213	136	<b>12.420<sup>a</sup></b>	<b>4</b>
20-49 employees	751.398	1480.574	115		
50-99 employees	1286.357	2637.067	70		
100-199 employees	1282.632	1406.761	38		
200-499 employees	3252.000	4008.129	25		
1-5 years old	760.416	1383.436	154	1.645	2
6-9 years old	974.846	2298.330	144		
≥10 years old	1256.333	2514.420	86		
Family Business	850.360	1633.495	178	0.82	1
Non Family Business	1039.621	2341.123	206		
Male	980.215	2119.60	300	0.26	1
Female	850.738	1752.335	84		
18-30 years old	<b>1047.227</b>	2139.353	44	<b>7.700<sup>a</sup></b>	3
31-45 years old	<b>1050.400</b>	2262.435	246		
46-55 years old	<b>616.986</b>	1197.661	73		
≥56 years old	<b>762.381</b>	1292.626	21		
Relative Role Model	1027.834	1962.444	140	0.30	1
No Relative Role Model	908.318	2091.233	244		
Registered Business	1047.259	2324.365	166	1.01	2
Partnership	681.846	1447.565	88		
Limited liability	1012.915	2002.189	130		
Degree	1144.63	2443.907	189	<b>3.33<sup>c</sup></b>	1
No Degree	765.084	1544.188	195		
Exporter	1219.579	2139.408	107	<b>5.11<sup>b</sup></b>	1
Non-Exporter	848.489	1999.536	277		
Innovator – Product	1020.918	2131.821	297	1.50	1
None	716.251	1697.537	87		
Innovator – Process	1223.812	2584.662	156	<b>4.70<sup>b</sup></b>	1
None	765.842	1548.603	228		
Innovator – Work	1470.471	2674.799	186	<b>24.67<sup>a</sup></b>	1
None	464.741	952.386	198		
Innovator – Supply	1431.421	2536.115	165	<b>16.58<sup>a</sup></b>	1
None	590.603	1480.657	219		
Innovator – Markets	1195.151	2382.279	242	<b>9.48<sup>a</sup></b>	1
None	537.323	1169.423	142		
Innovator – Administration	1394.188	2376.395	163	<b>13.71<sup>a</sup></b>	1
None	625.673	1690.919	221		
Innovator – Distribution	1226.165	2331.104	167	<b>5.38<sup>a</sup></b>	1
None	740.815	1767.771	217		
R&D Expenditure as a % of turnover: None	<b>892.429</b>	1877.266	42	<b>7.304<sup>a</sup></b>	5
1-2%	<b>841.699</b>	1571.214	134		
3-5%	<b>880.388</b>	1765.788	100		
6-10%	<b>1311.967</b>	3119.426	60		
11-20%	<b>1058.065</b>	2736.376	31		
≥21%	<b>923.529</b>	732.956	17		

*The amount of external finance obtained*

Next, attention focuses upon the descriptive statistics and ANOVAs for the amount of external finance which was obtained. Overall, on average the amount of external finance which was received was 579,044 yuan which is roughly \$77,129. As with the results from Table 8.2, the results presented in Table 8.3, show the importance of innovation and finance. More specifically in Table 8.3 it is apparent that 6 of the 7 types of innovation were statistically related to the amount of external finance which was received at the 5% level or better. Indeed, the only type of innovation which was not statistically significant at the 0.10 level, or better, was product innovation – a similar pattern from Table 8.2. Process innovators on average received 743,355 yuan compared to 466,621 yuan for non-process innovators. Distribution innovators received 755,638 on average whilst the non-distribution innovators received 443,140. For the other types of innovation which were statistically significant, the innovators received more than double the amount received by the non-innovators. Interestingly, again the R&D expenditure was not statistically significantly related to the amount of external finance which was received.

Thus, the bivariate results are not supportive of hypothesis H8. Instead, the innovative businesses are able to secure more finance than their non-innovating business counterparts.

Again, looking at the control variables relating to the characteristics of the businesses and the entrepreneurs, two variables are statistically significant. The sector and also the holding of a degree were both statistically significant at the 5% level and suggested that service sector firms received 75% more external finance than manufacturing firms, and that those with degrees obtained 63% more external finance than those own-managers who did not possess a degree.

**Table 8.3: Descriptive statistics and ANOVAs – the amount of external finance which was obtained, by those businesses seeking external finance.**  
(NB: Values are for per 1,000)

	Mean	S.D	N	F	df
All	579.044	1316.347	384		
Sector - Manufacturing	440.886	972.456	224	<b>6.00<sup>b</sup></b>	<b>1</b>
Services	772.466	1668.247	160		
8-19 employees	265.042	860.243	136	<b>8.571<sup>a</sup></b>	<b>4</b>
20-49 employees	490.643	1085.394	115		
50-99 employees	812.932	1818.480	70		
100-199 employees	752.579	813.375	38		
200-499 employees	1775.200	2252.255	25		
1-5 years old	486.602	985.273	154	0.928	2
6-9 years old	589.444	1506.481	144		
≥10 years old	727.167	1484.703	86		
Family Business	519.571	1113.730	178	0.68	1
Non Family Business	630.433	1469.908	206		
Gender – Male	502.511	979.206	300	0.36	1
Female	600.473	1396.887	84		
18-30 years old	570.148	1194.932	44	0.774	3
31-45 years old	646.187	1480.647	246		
46-55 years old	385.975	848.360	73		
≥56 years old	482.298	681.375	21		
Relative Role Model	644.149	1283.295	140	0.54	1
No Relative Role Model	541.689	1236.116	240		
Registered Business	648.170	1621.689	166	1.40	1
Partnership	373.645	722.938	88		
Limited liability	629.815	1179.314	130		
Degree	719.84	1651.586	189	<b>4.29<sup>b</sup></b>	1
No Degree	442.580	859.927	195		
Exporter	704.224	1356.364	107	1.34	1
Non-Exporter	530.689	1299.826	277		
Innovator – Product	616.992	1350.872	297	1.09	1
None	449.498	1189.124	87		
Innovator – Process	743.355	1608.627	156	<b>4.13<sup>b</sup></b>	1
None	466.621	1060.85	228		
Innovator – Work	875.948	1698.975	186	<b>19.22<sup>a</sup></b>	1
None	300.134	704.757	198		
Innovator – Supply	868.486	1685.578	165	<b>14.48<sup>a</sup></b>	1
None	360.971	892.013	219		
Innovator – Markets	715.146	1517.465	242	<b>7.11<sup>a</sup></b>	1
None	347.096	827.614	142		
Innovator – Administration	852.884	1514.80	163	<b>12.63<sup>a</sup></b>	1
None	377.072	1109.225	221		
Innovator – Distribution	755.638	1537.177	167	<b>5.38<sup>b</sup></b>	1
None	443.140	1101.747	217		
R&D Expenditure as a % of turnover: None	662.274	1455.235	42	0.442	5
1-2%	484.885	884.870	134		
3-5%	559.941	1274.284	100		
6-10%	769.875	1956.277	60		
11-20%	611.652	1623.960	31		
≥21%	495.000	444.754	17		

## **8.4 Regression Data Analysis**

Taken together the analysis of the summary statistics and ANOVAs suggests that for all types of innovation, with the exception of product innovation, the innovators sought more finance and also received more external finance than the non-innovators, but that R&D expenditure is not related to the amount of money sought or received. Where possible it is desirable to use multivariate regression analysis to test hypotheses. The multivariate regression analysis allows us to see whether innovation is or is not important whilst simultaneously including control variables which, based on theory and past empirical research, it would be logical to include.

### **Regression Results**

Table 8.4 provides a key of the variables which have been included in the econometric analysis. Table 8.5 provides a correlation matrix of the variables used in this chapter. There was no evidence to suggest the presence of multicollinearity. Thus, the results presented in the chapter should be valid.

It is important, where possible, to test hypotheses using multivariate analysis as this allows several possible relationships to be explored simultaneously. The values produced for the incremental innovation and also the novel innovation for the seven types of innovation, product/service and/or process innovation, and the five other types of innovation form the focus of the econometric analysis, together with expenditure on R&D.

**Table 8.4: Key of Variables included in the regression analysis models**

Variables	
1. Sector	1=Manufacturing and 0 =Services
2. Size	The number of employees (log)
3. Age of Business	The age of the business (log)
4. Family Business	1=Family business and 0=Non-family business
5. Gender	1=Male and 0=Female
6. Age of Owner-Manager	The age of the entrepreneur (log)
7. Relative Role Model	1=Relative role model and 0=No relative role model
8. Registered business	1=Registered business and 0=not a registered business. This is the excluded comparison dummy variable.
8. Limited liability	1= limited liability and 0=not a limited liability. Dummy variable type of business and with registered business as the excluded comparison type of business.
9. Partnership	1=partnership and 0=not a partnership. Dummy variable type of business and with registered business as the excluded comparison type of business.
10. Degree	1=Degree and 0=no degree
11. Exporter	1=Exporter and 0=Non-exporter
12. Innovator – Product	1=Product innovator and 0=non-product innovator
13. Innovator – Process	1=Process innovator and 0=non-process innovator
14. Innovator – Work	1=Work innovator and 0=non-work innovator
15. Innovator – Supply	1=Supply innovator and 0=non-supply innovator
16. Innovator – Markets	1=Market innovator and 0=non-market innovator
17. Innovator – Administration	1=Administration innovation and 0=non-administration innovation
18. Innovator – Distribution	1=Distribution innovation and 0=non-distribution innovation
19. R&D Expenditure as a % of turnover: None	1=No expenditure on R&D and 0=expenditure on R&D. Dummy variable which is the excluded comparison dummy.
20. 1-2%	1=R&D expenditure is 1-2% of turnover and 0=R&D expenditure is not 1-2% of turnover.
21. 3-5%	1=R&D expenditure is 3-5% of turnover and 0=R&D expenditure is not 3-5% of turnover.
22. 6-10%	1=R&D expenditure is 6-10% of turnover and 0=R&D expenditure is not 6-10% of turnover.
23. 11-20%	1=R&D expenditure is 11-20% of turnover and 0=R&D expenditure is not 11-20% of turnover.
24. $\geq 21\%$	1=R&D expenditure is $\geq 21\%$ of turnover and 0=R&D expenditure is not $\geq 21\%$ of turnover.

**Table 8.5: Correlation Matrix**

Variables	1	2	3	4	5	6	7	8	9	10
1. Sector	1.000									
2. Size	0.068	1.000								
3. Age of Business	0.166 <sup>a</sup>	0.220 <sup>a</sup>	1.000							
4. Family Business	-0.009	0.032	0.135 <sup>a</sup>	1.000						
5. Gender	-0.026	0.013	0.078	-0.013	1.000					
6. Age of Owner-Manager	0.071	-0.074	0.222 <sup>a</sup>	0.035	0.105 <sup>b</sup>	1.000				
7. Relative Role Model	0.004	-0.005	0.036	0.300	0.034	0.070	1.000			
8. Type of Business	0.030	0.083 <sup>c</sup>	0.073	-0.157 <sup>a</sup>	0.015	0.139 <sup>a</sup>	-0.129 <sup>b</sup>	1.000		
9. Degree	-0.129 <sup>b</sup>	0.199 <sup>a</sup>	-0.150 <sup>a</sup>	-0.226 <sup>a</sup>	0.004	-0.218 <sup>a</sup>	-0.215 <sup>a</sup>	0.088 <sup>c</sup>	1.000	
10. Exporter	0.160 <sup>a</sup>	0.321 <sup>a</sup>	-0.012	0.063	-0.079	-0.089 <sup>c</sup>	-0.001	0.040	0.097 <sup>c</sup>	1.000
11. Innovator – Product	-0.016	0.212 <sup>a</sup>	-0.002	0.091 <sup>c</sup>	0.030	-0.088 <sup>c</sup>	-0.055	0.049	0.147 <sup>a</sup>	0.045
12. Innovator – Process	0.131	0.127 <sup>b</sup>	0.007	0.007	0.014	-0.168 <sup>a</sup>	-0.010	0.065	0.045	0.065
13. Innovator – Work	-0.239 <sup>a</sup>	0.121 <sup>b</sup>	0.017	-0.044	0.072	-0.160 <sup>a</sup>	-0.020	0.027	0.088 <sup>c</sup>	-0.010
14. Innovator – Supply	-0.024	0.110 <sup>b</sup>	-0.055	-0.026	0.014	-0.153 <sup>a</sup>	0.031	-0.052	0.029	0.047
15. Innovator – Markets	-0.078	0.130 <sup>b</sup>	-0.155 <sup>a</sup>	-0.067	0.025	-0.147 <sup>a</sup>	-0.025	0.078	0.172 <sup>a</sup>	0.211 <sup>a</sup>
16. Innovator – Administration	-0.268 <sup>a</sup>	0.093 <sup>c</sup>	-0.040	-0.101 <sup>b</sup>	-0.004	-0.121 <sup>b</sup>	-0.038	0.074	0.114 <sup>b</sup>	0.054
17. Innovator – Distribution	-0.068	0.054	-0.030	-0.004	0.045	-0.031	0.045	0.052	0.019	0.099 <sup>c</sup>
18. R&D Expenditure as a % of turnover	-0.015	0.119 <sup>b</sup>	-0.096 <sup>c</sup>	0.016	0.015	-0.135 <sup>a</sup>	-0.070	0.037	0.143 <sup>a</sup>	-0.020

**N=384**

**Table 8.5: Correlation Matrix**

Variables	11	12	13	14	15	16	17	18
1. Sector								
2. Size								
3. Age of Business								
4. Family Business								
5. Gender								
6. Age of Owner-Manager								
7. Relative Role Model								
8. Type of Business								
9. Degree								
10. Exporter								
11. Innovator – Product	1.000							
12. Innovator – Process	0.296 <sup>a</sup>	1.000						
13. Innovator – Work	0.151 <sup>a</sup>	0.397 <sup>a</sup>	1.000					
14. Innovator – Supply	0.105 <sup>b</sup>	0.246 <sup>a</sup>	0.401 <sup>a</sup>	1.000				
15. Innovator – Markets	0.230 <sup>a</sup>	0.183 <sup>a</sup>	0.300 <sup>a</sup>	0.273 <sup>a</sup>	1.000			
16. Innovator – Administration	0.125 <sup>b</sup>	0.309 <sup>a</sup>	0.495 <sup>a</sup>	0.308 <sup>a</sup>	0.353 <sup>a</sup>	1.000		
17. Innovator – Distribution	0.211 <sup>a</sup>	0.323 <sup>a</sup>	0.380 <sup>a</sup>	0.374 <sup>a</sup>	0.237 <sup>a</sup>	0.437 <sup>a</sup>	1.000	
18. R&D Expenditure as a % of turnover	0.353 <sup>a</sup>	0.344 <sup>a</sup>	0.218 <sup>a</sup>	0.220 <sup>a</sup>	0.220 <sup>a</sup>	0.197 <sup>a</sup>	0.223 <sup>a</sup>	1.000

**N=384**

*The percentage of money received from that sought*

Tobit regression analysis is utilized when the dependent variable takes values which are a constrained set of values. Given that the percentage of money received from that sought is by definition from 0 to 100%, this renders it necessary to utilize a tobit regression model. Tobit estimate models were conducted with regard to the dependent variable relating to 'the proportion of external finance which was obtained'. Control variables plus the product innovation variable relating to the propensity to report the 'the proportion of external finance which was obtained' was included in Model 1 in Table 8.6. In this table the best fit approach was followed. The model has a Nagelkerke  $R^2$  of 0.156 and is significant at the 0.01 level. The product innovation variable is not statistically significant at the 0.10 level, or better. Thus, the evidence does not support hypothesis H6.

In models 2 to 7, the product innovation variable was replaced one at a time with the following innovation variables – process, work, supply, markets, administration and distribution, respectively. In model 8, the product innovation variable was replaced with five dummy variables of R&D expenditure as a proportion of turnover: 1-2%, 3-5%, 6-10%, 11-20%, and  $\geq 21\%$ , where the excluded comparison group was no expenditure on R&D.

Models 2 to 8 are also individually statistically significant at the 0.01 level.

With regard to Models 2 to Model 7, a similar set of regression results were obtained. The Nagelkerke  $R^2$  values are all around 0.15. The results do not support hypothesis H6.

In contrast, in model 8 the R&D expenditure dummy variables are all statistically significant and appear with negatively signed coefficients. In contrast, the input measure of innovation, R&D expenditure which was included as a set of dummy

variables, showed that those firms which spent money on R&D were less likely to receive a higher proportion of the external finance sought compared to those firms which spent zero on R&D. Freel (2007) found that firms which had spent more on R&D were less successful in receiving their sought finance, but his findings were statistically significant at the 10% level.

Several of the control variables were consistently statistically significant in models 1 to 8. Manufacturing sector firms were more likely to receive a higher proportion of the funds which they were seeking than service sector firms. This relationship was statistically significant at the 0.05 level. The exporters were less likely than the non-exporters to receive a greater proportion of the funds they were seeking, and this also was statistically significant at the 0.05 level. In other words, the non-exporters were the type of firms who were more likely to receive a greater proportion of the funds they were seeking. A third control variable, the limited liability dummy was statistically significant at the 0.05 level. The limited liability businesses were more likely than the registered businesses to receive a greater proportion of the finance they were seeking. However, the other control variables included in the model were not statistically significant. Thus, possessing a degree or having a relative role model or being a partnership (compared to a registered business) were not systematically and statistically related to the proportion of external finance which was obtained. Additionally, the other control variables of size of the firm, age of the business, family business, gender and age of the entrepreneur which are not included in the final best fit models in Table 8.6 were also found to not be statistically related to the proportion of external finance sought which was obtained.

**Table 8.6: Estimates of a best fit tobit model of the proportion of external finance which was obtained, by those businesses seeking external finance.**

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Sector	<b>0.065</b> (0.030) <sup>b</sup>	<b>0.065</b> (0.030) <sup>b</sup>	<b>0.069</b> (0.030) <sup>b</sup>	<b>0.065</b> (0.032) <sup>b</sup>	<b>0.065</b> (0.032) <sup>b</sup>	<b>0.068</b> (0.033) <sup>b</sup>	<b>0.063</b> (0.032) <sup>b</sup>	<b>0.065</b> (0.031) <sup>b</sup>
Relative Role Model	-0.023 (0.033)	-0.022 (0.032)	-0.022 (0.033)	-0.022 (0.033)	-0.022 (0.033)	-0.022 (0.032)	-0.024 (0.033)	-0.015 (0.032)
Limited Liability	<b>0.074</b> (0.035) <sup>b</sup>	<b>0.073</b> (0.035) <sup>b</sup>	<b>0.072</b> (0.035) <sup>b</sup>	<b>0.072</b> (0.035) <sup>b</sup>	<b>0.073</b> (0.036) <sup>b</sup>	<b>0.073</b> (0.036) <sup>b</sup>	<b>0.070</b> (0.035) <sup>b</sup>	<b>0.075</b> (0.035) <sup>b</sup>
Partnership	0.050 (0.040)	0.055 (0.400)	0.055 (0.040)	0.054 (0.040)	0.055 (0.040)	0.056 (0.039)	0.057 (0.039)	0.062 (0.039)
Degree	-0.012 (0.032)	-0.018 (0.032)	-0.019 (0.032)	-0.018 (0.032)	-0.018 (0.032)	-0.018 (0.032)	-0.019 (0.032)	-0.015 (0.032)
Exporter	<b>-0.082</b> (0.035) <sup>b</sup>	<b>-0.083</b> (0.035) <sup>b</sup>	<b>-0.083</b> (0.035) <sup>b</sup>	<b>-0.083</b> (0.035) <sup>b</sup>	<b>-0.082</b> (0.035) <sup>b</sup>	<b>-0.082</b> (0.035) <sup>b</sup>	<b>-0.087</b> (0.034) <sup>b</sup>	<b>-0.075</b> (0.035) <sup>b</sup>
Innovator Product	-0.052 (0.037)	-----	-----	-----	-----	-----	-----	-----
Innovator Process	-----	-0.007 (0.031)	-----	-----	-----	-----	-----	-----
Innovator Work	-----	-----	-0.003 (0.032)	-----	-----	-----	-----	-----
Innovator Supply	-----	-----	-----	-0.010 (0.031)	-----	-----	-----	-----
Innovator Markets	-----	-----	-----	-----	-0.007 (0.033)	-----	-----	-----
Innovator Administration	-----	-----	-----	-----	-----	-0.008 (0.032)	-----	-----
Innovator Distribution	-----	-----	-----	-----	-----	-----	-0.033 (0.031)	-----
R&D (1-2%)	-----	-----	-----	-----	-----	-----	-----	<b>-0.190</b> (0.054) <sup>a</sup>
R&D (3-5%)	-----	-----	-----	-----	-----	-----	-----	<b>-0.157</b> (0.060) <sup>a</sup>
R&D (6-10%)	-----	-----	-----	-----	-----	-----	-----	<b>-0.130</b> (0.061) <sup>b</sup>
R&D (11-20%)	-----	-----	-----	-----	-----	-----	-----	<b>-0.140</b> (0.069) <sup>b</sup>
R&D (≥21%)	-----	-----	-----	-----	-----	-----	-----	<b>-0.287</b> (0.085) <sup>a</sup>
Constant	<b>0.693</b> (0.046) <sup>a</sup>	<b>0.657</b> (0.039) <sup>a</sup>	<b>0.657</b> (0.042) <sup>a</sup>	<b>0.659</b> (0.042) <sup>a</sup>	<b>0.659</b> (0.042) <sup>a</sup>	<b>0.659</b> (0.041) <sup>a</sup>	<b>0.641</b> (0.040) <sup>a</sup>	<b>0.798</b> (0.056) <sup>a</sup>
Log likelihood	-134.92	-135.89	-135.91	-135.86	-135.89	-135.88	-135.36	-127.73
Pseudo R <sup>2</sup>	0.1564	0.1497	0.1495	0.1499	0.1497	0.1497	0.1533	0.2067

n=384

### *The Amount of Money Sought*

However, whilst the overall amount of finance which is received compared with that sought is important there is a need to take the analysis further and dissect it to see whether innovating firms seek more finance than non-innovators, and also the extent to which the aforementioned firms receive more finance than non-innovators. Attention now centres upon the amount of money sought.

The amount of money sought was used as the dependent variable in a model which was estimated using Ordinary Least Squares (OLS) regression techniques. Control variables relating to the amount of external finance which was sought, by those businesses seeking external finance, together with the product innovation variable were included in Model 9 in Table 8.7. The model has an  $R^2$  of 0.318 and is significant at the 0.01 level. With regard to Model 9, those firms who introduced product innovation sought more external finance compared to the non-product innovation firms but this was not statistically significant. Thus, the results in Model 9 are not consistent with hypothesis H7.

In models 10 to 15 the product innovation variable was replaced one at a time with the following innovation variables – process, work, supply, markets, administration and distribution respectively. In model 16, the product innovation variable was replaced with five dummy variables of R&D expenditure as a proportion of turnover: 1-2%, 3-5%, 6-10%, 11-20%, and  $\geq 21\%$ , and where the excluded comparison group had no expenditure on R&D.

Models 10 to 16 are individually statistically significant at the 0.01 level.

In model 10 in which product innovation is replaced with process innovation the  $R^2$  value is 0.316. In model 10, those firms who introduced process innovation also sought more external finance compared to the non-process innovation firms.

However, as with model 9 the innovation variable in model 10 is not statistically significant. Again the results are not supportive of hypothesis H7.

In models 11 to 15 the  $R^2$  values are all comparatively healthy and ranged from 0.3213 (model 13, market innovation included) to 0.3498 (model 12, supply innovation included). In models 11 to 15 a different pattern of results for the innovation variables was found compared to the results in models 9 and 10. More specifically, in models 11 to 15 work, supply, markets, administration and also distribution appeared with positively signed coefficients and were all statistically significant at the 1% level, with the sole exception of markets which was statistically significant at the 10% level. The results in models 11 to 15 are all supportive of hypothesis H7. In contrast, in model 16 none of the R&D expenditure dummy variables are statistically significant and that result is not supportive of hypothesis H7.

Looking at the control variables, it is clear that several are statistically significant at the 5% level, or better. Larger sized businesses, non-family businesses and those owners who had a relative role model were more likely to seek greater amounts of external finance. Manufacturing firms were less likely than service sector firms to seek larger amounts of external finance as were partnerships compared to extended sole proprietorships businesses.

**Table 8.7: Estimates of the natural log of the amount of external finance which was sought, by those businesses seeking external finance.**

	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Sector	<b>-0.574</b> (0.142) <sup>a</sup>	<b>-0.573</b> (0.412) <sup>a</sup>	<b>-0.456</b> (0.145) <sup>a</sup>	<b>-0.562</b> (0.139) <sup>a</sup>	<b>-0.554</b> (0.143) <sup>a</sup>	<b>-0.444</b> (0.147) <sup>a</sup>	<b>-0.542</b> (0.142) <sup>a</sup>	<b>-0.559</b> (0.144) <sup>a</sup>
Size	<b>0.795</b> (0.078) <sup>a</sup>	<b>0.807</b> (0.077) <sup>a</sup>	<b>0.782</b> (0.076) <sup>a</sup>	<b>0.774</b> (0.075) <sup>a</sup>	<b>0.799</b> (0.077) <sup>a</sup>	<b>0.792</b> (0.076) <sup>a</sup>	<b>0.804</b> (0.076) <sup>a</sup>	<b>0.810</b> (0.077) <sup>a</sup>
Age of Business	0.093 (0.117)	0.088 (0.117)	0.061 (0.116)	0.107 (0.114)	0.113 (0.117)	0.080 (0.115)	0.094 (0.116)	0.095 (0.118)
Family Business	<b>-0.380</b> (0.164) <sup>b</sup>	<b>-0.350</b> (0.162) <sup>b</sup>	<b>-0.320</b> (0.159) <sup>b</sup>	<b>-0.318</b> (0.151) <sup>b</sup>	<b>-0.337</b> (0.161) <sup>b</sup>	<b>-0.397</b> (0.161) <sup>b</sup>	<b>-0.335</b> (0.160) <sup>b</sup>	<b>-0.381</b> (0.164) <sup>b</sup>
Gender	-0.111 (0.166)	-0.105 (0.166)	-0.151 (0.164)	-0.130 (0.162)	-0.122 (0.165)	-0.102 (0.163)	-0.129 (0.164)	-0.084 (0.167)
Age of Owner-Manager	-0.448 (0.357)	-0.453 (0.362)	-0.279 (0.356)	-0.266 (0.351)	-0.411 (0.357)	-0.353 (0.354)	-0.441 (0.353)	-0.399 (0.361)
Relative Role Model	<b>0.403</b> (0.165) <sup>b</sup>	<b>0.388</b> (0.165) <sup>b</sup>	<b>0.375</b> (0.162) <sup>b</sup>	<b>0.347</b> (0.161) <sup>b</sup>	<b>0.378</b> (0.164) <sup>b</sup>	<b>0.369</b> (0.162) <sup>b</sup>	<b>0.361</b> (0.163) <sup>b</sup>	<b>0.381</b> (0.165) <sup>b</sup>
Limited Liability	-0.051 (0.161)	-0.045 (0.161)	-0.065 (0.159)	-0.019 (0.156)	-0.065 (0.160)	-0.080 (0.159)	-0.068 (0.159)	-0.073 (0.163)
Partnership	<b>-0.503</b> (0.178) <sup>a</sup>	<b>-0.515</b> (0.178) <sup>a</sup>	<b>-0.459</b> (0.175) <sup>a</sup>	<b>-0.433</b> (0.175) <sup>b</sup>	<b>-0.501</b> (0.178) <sup>a</sup>	<b>-0.540</b> (0.176) <sup>a</sup>	<b>-0.505</b> (0.177) <sup>a</sup>	<b>-0.548</b> (0.180) <sup>a</sup>
Degree	0.096 (0.150)	0.112 (0.149)	0.110 (0.147)	0.128 (0.146)	0.091 (0.150)	0.105 (0.147)	0.117 (0.148)	0.117 (0.150)
Exporter	0.197 (0.163)	0.189 (0.164)	0.197 (0.161)	0.182 (0.160)	0.138 (0.165)	0.154 (0.162)	0.145 (0.163)	0.176 (0.167)
Innovator Product	0.162 (0.170)	-----	-----	-----	-----	-----	-----	-----
Innovator Process	-----	0.027 (0.142)	-----	-----	-----	-----	-----	-----
Innovator Work	-----	-----	<b>0.479</b> (0.142) <sup>a</sup>	-----	-----	-----	-----	-----
Innovator Supply	-----	-----	-----	<b>0.604</b> (0.137) <sup>a</sup>	-----	-----	-----	-----
Innovator Markets	-----	-----	-----	-----	<b>0.258</b> (0.149) <sup>c</sup>	-----	-----	-----
Innovator Administration	-----	-----	-----	-----	-----	<b>0.459</b> (0.144) <sup>a</sup>	-----	-----
Innovator Distribution	-----	-----	-----	-----	-----	-----	<b>0.375</b> (0.137) <sup>a</sup>	-----
R&D (1-2%)	-----	-----	-----	-----	-----	-----	-----	0.106 (0.243)
R&D (3-5%)	-----	-----	-----	-----	-----	-----	-----	0.155 (0.250)
R&D (6-10%)	-----	-----	-----	-----	-----	-----	-----	-0.090 (0.274)
R&D (11-20%)	-----	-----	-----	-----	-----	-----	-----	-0.054 (0.322)
R&D (≥21%)	-----	-----	-----	-----	-----	-----	-----	0.496 (0.398)
Constant	<b>13.873</b> (1.329) <sup>a</sup>	<b>13.956</b> (1.347) <sup>a</sup>	<b>13.184</b> (1.327) <sup>a</sup>	<b>13.075</b> (1.308) <sup>a</sup>	<b>13.661</b> (1.333) <sup>a</sup>	<b>13.408</b> (1.319) <sup>a</sup>	<b>13.777</b> (1.313) <sup>a</sup>	<b>13.675</b> (1.365) <sup>a</sup>
F Test	<b>15.85<sup>a</sup></b>	<b>15.74<sup>a</sup></b>	<b>17.15<sup>a</sup></b>	<b>18.17<sup>a</sup></b>	<b>16.11<sup>a</sup></b>	<b>17.01<sup>a</sup></b>	<b>16.67<sup>a</sup></b>	<b>11.98<sup>a</sup></b>
R <sup>2</sup> bar	0.3175	0.3159	0.3361	0.3498	0.3213	0.3341	0.3292	0.3146

n=384

*The amount of external finance obtained*

In Table 8.8 the analysis of the amount of finance obtained showed that innovators were more likely to receive a greater amount of external finance compared to non-innovators for the following types of innovation: work, supply, administration and also distribution. In contrast innovators in products, processes and also marketing were not found to differ statistically in the amount of finance received. However, R&D expenditure was not statistically related to the amount of finance obtained. The results in Table 8.8 are not supportive of the hypothesis H8.

The same set of business and owner-manager characteristics found to be statistically significant in Table 8.4 are also found in Table 8.7. Thus, service sector firms, larger firms, non-family businesses and owner-managers with a business role model were more likely to receive a greater amount of external finance. Partnership businesses were less likely to receive a greater amount of external finance than extended sole proprietorship businesses.

**Table 8.8: Estimates of the natural log of the amount of external finance which was obtained, by those businesses seeking external finance.**

	Model 17	Model 18	Model 19	Model 20	Model 21	Model 22	Model 23	Model 24
Sector	<b>-0.471</b> (0.144) <sup>a</sup>	<b>-0.471</b> (0.144) <sup>a</sup>	<b>-0.55</b> (0.145) <sup>b</sup>	<b>-0.459</b> (0.140) <sup>a</sup>	<b>-0.453</b> (0.144) <sup>a</sup>	<b>-0.332</b> (0.147) <sup>b</sup>	<b>-0.434</b> (0.142) <sup>a</sup>	<b>-0.497</b> (0.142) <sup>a</sup>
Size	<b>0.937</b> (0.131) <sup>a</sup>	<b>0.948</b> (0.129) <sup>a</sup>	<b>0.909</b> (0.129) <sup>a</sup>	<b>0.891</b> (0.127) <sup>a</sup>	<b>0.925</b> (0.129) <sup>a</sup>	<b>0.915</b> (0.128) <sup>a</sup>	<b>0.932</b> (0.128) <sup>a</sup>	<b>0.945</b> (0.130) <sup>a</sup>
Age of Business	-0.214 (0.197)	-0.212 (0.196)	-0.246 (0.196)	-0.189 (0.193)	-0.177 (0.197)	-0.228 (0.194)	-0.206 (0.195)	-0.199 (0.198)
Family Business	<b>-0.359</b> (0.164) <sup>b</sup>	<b>-0.345</b> (0.162) <sup>b</sup>	<b>-0.312</b> (0.160) <sup>c</sup>	<b>-0.306</b> (0.159) <sup>c</sup>	<b>-0.330</b> (0.162) <sup>b</sup>	<b>-0.291</b> (0.160) <sup>c</sup>	<b>-0.325</b> (0.160) <sup>b</sup>	<b>-0.332</b> (0.177) <sup>b</sup>
Gender	0.176 (0.279)	0.185 (0.279)	0.123 (0.278)	0.142 (0.274)	0.150 (0.279)	0.180 (0.277)	0.142 (0.278)	0.163 (0.282)
Age of Owner-Manager	-0.325 (0.601)	-0.404 (0.608)	-0.116 (0.603)	-0.051 (0.595)	-0.246 (0.600)	-0.164 (0.597)	-0.293 (0.596)	-0.213 (0.606)
Relative Role Model	<b>0.352</b> (0.165) <sup>b</sup>	<b>0.343</b> (0.164) <sup>b</sup>	<b>0.328</b> (0.162) <sup>b</sup>	<b>0.305</b> (0.161) <sup>c</sup>	<b>0.334</b> (0.164) <sup>b</sup>	<b>0.325</b> (0.162) <sup>b</sup>	<b>0.307</b> (0.162) <sup>c</sup>	<b>0.308</b> (0.163) <sup>c</sup>
Limited Liability	0.221 (0.271)	0.240 (0.271)	0.197 (0.269)	0.255 (0.266)	0.187 (0.270)	0.168 (0.268)	0.186 (0.269)	0.204 (0.273)
Partnership	<b>-0.507</b> (0.186) <sup>a</sup>	<b>-0.506</b> (0.185) <sup>a</sup>	<b>-0.433</b> (0.183) <sup>b</sup>	<b>-0.458</b> (0.180) <sup>b</sup>	<b>-0.482</b> (0.185) <sup>b</sup>	<b>-0.501</b> (0.181) <sup>a</sup>	<b>-0.470</b> (0.182) <sup>b</sup>	<b>-0.453</b> (0.184) <sup>b</sup>
Degree	-0.207 (0.252)	-0.207 (0.251)	-0.207 (0.250)	-0.182 (0.247)	-0.237 (0.251)	-0.214 (0.249)	-0.198 (0.250)	-0.195 (0.253)
Exporter	-0.108 (0.276)	-0.106 (0.275)	-0.101 (0.273)	-0.118 (0.271)	-0.188 (0.279)	-0.161 (0.273)	-0.171 (0.275)	-0.179 (0.281)
Innovator Product	0.028 (0.287)	-----	-----	-----	-----	-----	-----	-----
Innovator Process	-----	-0.177 (0.239)	-----	-----	-----	-----	-----	-----
Innovator Work	-----	-----	<b>0.548</b> (0.241) <sup>b</sup>	-----	-----	-----	-----	-----
Innovator Supply	-----	-----	-----	<b>0.840</b> (0.232) <sup>a</sup>	-----	-----	-----	-----
Innovator Markets	-----	-----	-----	-----	0.395 (0.251)	-----	-----	-----
Innovator Administration	-----	-----	-----	-----	-----	<b>0.672</b> (0.242) <sup>a</sup>	-----	-----
Innovator Distribution	-----	-----	-----	-----	-----	-----	<b>0.533</b> (0.231) <sup>b</sup>	-----
R&D (1-2%)	-----	-----	-----	-----	-----	-----	-----	0.468 (0.409)
R&D (3-5%)	-----	-----	-----	-----	-----	-----	-----	0.307 (0.421)
R&D (6-10%)	-----	-----	-----	-----	-----	-----	-----	-0.049 (0.461)
R&D (11-20%)	-----	-----	-----	-----	-----	-----	-----	0.404 (0.541)
R&D (≥21%)	-----	-----	-----	-----	-----	-----	-----	0.711 (0.668)
Constant	<b>12.438</b> (2.238) <sup>a</sup>	<b>12.766</b> (2.262) <sup>a</sup>	<b>11.523</b> (2.249) <sup>a</sup>	<b>11.169</b> (2.212) <sup>a</sup>	<b>11.936</b> (2.243) <sup>a</sup>	<b>11.589</b> (2.226) <sup>a</sup>	<b>12.139</b> (2.215) <sup>a</sup>	<b>11.753</b> (2.295) <sup>a</sup>
F Test	<b>15.47<sup>a</sup></b>	<b>15.52<sup>a</sup></b>	<b>15.97<sup>a</sup></b>	<b>16.75<sup>a</sup></b>	<b>15.71<sup>a</sup></b>	<b>16.22<sup>a</sup></b>	<b>15.99<sup>a</sup></b>	<b>14.31<sup>a</sup></b>
R <sup>2</sup> bar	0.3228	0.3241	0.3348	0.3527	0.3287	0.3406	0.3352	0.3213

n=384

## 8.5 Discussion and Implications

### Key findings

#### *The percentage of money received from that sought*

The bivariate results suggested that with regard to the 8 measures of innovation only the percentage of turnover spent on R&D dummy variables was statistically significant at the 0.1 level, or better; and it was statistically significant at the 0.05 level. The multivariate regression results with regard to innovation were consistent with the bivariate results.

Overall, the results suggest that in China external sources of finance, such as the banks, have problems and difficulties in evaluating firms whose projects are innovation based. To the possible external funders there is a perception that if they provide firms which are spending money on R&D, considered a high risk group of firms, with the sought finance there are no prospects of receiving compensating high rewards because they do not usually share in the upside if the innovation proves profitable (Mason and Harrison, 2004). Moreover, in spending capital on R&D, the SMEs are generally going to generate either negligible or limited tangible assets, and the uncertainty and unpredictability of when the R&D expenditure will prove successful and increase turnover mitigates against the likelihood of external funders receiving the debt service payments (Oakey and Mukhtar, 1999). Hence, the greater probability of credit rationing to R&D spenders. Innovation is a much harder measure for the possible external providers of capital to assess, hence the lack of statistically significant relationships in the bivariate tables and in the regression results in Table 8.6.

The results in Table 8.6 also showed that three other factors were more important and were statistically significant at the 5% level. For example, exporters

were less likely to receive a greater proportion of their sought finance. Manufacturing firms were more likely than service sector firms to achieve a greater proportion of the external finance they sought as were limited companies businesses compared to extended sole proprietorship. As the world's factory, Chinese firms are required to enhance their know-how in terms of dealing with unfamiliar markets and fulfil the different needs of a widespread customer base. Exporters could well be operating in more risky markets where there has been trialling and experience in the past, and the exporters could thus be less credit trustworthy to external providers of finance. In order to be successful in foreign markets, exporters must have clear competitive advantages (e.g. substantially lower cost of the goods, considerably higher quality versus price, unique knowledge) otherwise local businesses almost always have better knowledge and understanding of their own market which could be hard to compete with (McDougall and Oviatt, 1996). In the case of innovating firms and those expending resources on R&D, the possibility of protecting unique knowledge through patented products is very limited in China, a country where most businesses infringe patents and copyrights with alacrity.

#### *The Amount of Money Sought*

The regression results in Table 8.7 demonstrate that innovative firms are more likely to seek more external finance than non-innovators and this applied to work, supply, markets, administration and distribution types of innovators. However, there were no statistically significant differences between product innovators and their non-innovative counterparts, and between process innovators and their equivalents, with respect to the amount of external finance sought. The input measure of innovation –

R&D expenditure - was not statistically significant, and this applied to when R&D was captured as a series of dummy variables and also as a continuous variable.

The regression results also show that whilst process innovation was statistically significantly related to the amount of external finance sought at a bivariate level of analysis, when the research is taken further to a multivariate regression context the inclusion of the control variables renders process innovation no longer statistically significant.

However, the regression results also confirm the findings of the bivariate results that, in addition to innovation, there are several control variables which are important and were statistically significantly related to the amount of external finance sought. Manufacturers sought less money than service sector businesses, and partnerships sought less than registered businesses, whilst the entrepreneurs with a relative role model, the larger sized businesses and the non-family businesses sought more money.

Equally, the models in Table 8.6 showed that several control variables were not systematically related to the amount of money sought, neither were the gender or age of the entrepreneur. Thus, there was no difference between men and women in the amount sought, and similarly whether the entrepreneur was younger or older,.

#### *The Amount of Money Obtained*

In the fifth hypothesis it had been expected that the innovators would receive a smaller amount of external finance compared to the non-innovators. However, in the bivariate and also the multivariate regression analysis several types of innovators – work, supply, administration and also distribution received a greater amount of external finance than their non-innovating counterparts. This result is difficult to

explain. Perhaps the innovating businesses have been more forceful and persistent and this has ultimately overturned some of the prejudices of financial investors.

## **8.6. Conclusion**

China formally joined the World Trade Organisation (WTO) in 2001 (Ning, 2007). This has limited the scope for China to intervene to assist particular segments or groups of firms. Ding et al. (2008) provide an excellent overview of the science and technology policies in China, post 1978, and they chronicle the financial and fiscal incentives which have been offered and developed over the years. The role of the Chinese government is to guide the process of liberalisation and, where necessary, intervene in the market to assist firms overcome learning costs and coordination problems (Chang, 2004; Rodrik, 2004). Whilst in the survey it was found that on average the SMEs which sought external finance received 65% of the finance requested, the inability to secure finance undoubtedly hinders their growth potential. Indeed, as Craig et al (2008: P346) states, “if small businesses face credit rationing, the next Google, Microsoft or Starbucks might wither on the vine for want of funding”.

Firstly, attention focuses upon the output measure of innovation and the results reported here show that innovators are more likely to apply for greater amounts of external finance, and to receive greater amounts of finance than non-innovators. Furthermore, when the relative proportion of external finance obtained which was sought was examined, it was found that innovative firms are not credit rationed.

Secondly, when the input measure of innovation was analysed the reverse of the output measures of innovation results was discovered. In other words, expenditure on R&D was not related to the amount of money sought, or received; but, those firms

which spent money on R&D were less likely to receive a higher proportion of the external finance they were seeking as proportion of that sought than those firms which did not spend money on R&D. So, the input measure of innovation does indeed provide some evidence of credit rationing.

So, interestingly, whilst innovative firms may run a higher risk of loan default than their non-innovative counterparts, the innovative firms in our analysis of the descriptive statistics suggests that if attention focuses upon output measures of innovation they are not necessarily problematic constituents for policy makers in Beijing. In contrast, the input measure of analysis – R&D expenditure - does suggest that the firms spending money in that area are less likely to be as successful as their counterparts without R&D expenditure, and in that regard this does suggest a potential problem for policy makers. As argued earlier SMEs are perceived to be more susceptible to default than larger firms, and firms spending money on R&D are more prone to default.

In the overall conclusion chapter the researcher will return to the research findings from this chapter to provide an overview of the implications of the chapter for theory and for practitioners or policy makers and the small business community in Beijing, and China.

## **Chapter 9:**

### **Summary, Conclusions and Recommendations**

#### **9.1 Introduction**

Small businesses and entrepreneurs represent potential sources of employment creation, alleviators of poverty, a source of taxation revenue and the future large sized firms which could help China to sustain her impressive rate of growth in an era of private ownership. This study has used human capital theory to focus upon innovators and non-innovators, using a broad set of types or facets of input and output measures of innovation to investigate access to finance in Beijing. Appropriate and pertinent theories of finance were drawn upon in the contextualisation in the front end chapters, and a total of eight hypotheses have been tested using a new bespoke survey and data set which was designed and collected by the researcher. This data set of 452 firms, of whom 384 had applied for external finance, allowed the eight hypotheses to be tested and for the researcher to make a contribution not only at a theoretical level but also at a practical level to our understanding of how entrepreneurs in Beijing from innovating and non-innovating businesses have been able to tap into external finance.

#### **9.2 Summary of Empirical Findings**

##### **9.2.1 Sources of start-up finance (Chapter 6)**

Chapter six presented findings on the relative levels of use and the importance of start-up finance for small businesses and also examined the role of a specific form of human capital – innovation in the accessing and using of these sources. The analysis also included other characteristics of the business and the entrepreneurs. The

results found that 87.83% of entrepreneurs indicated that they had used their own funds as a source of start-up finance and this was by far the most important source of start-up finance. Indeed, the mean amount of start-up finance from own savings was 60.50%. Ordinary shares were used by 30.09% of entrepreneurs at the start-up stage and on average this source of finance accounted for 17.70% of start-up finance. The third most used source of start-up finance was partners and this was used by 29.42% of entrepreneurs, and on average it accounted for 12.76% of start-up finance. The fourth most used source of finance at start-up was family contributions with 14.60%, and on average the family contributions formed 6.08% of start-up capital. Bank loans and overdrafts were only used by 3.10% of entrepreneurs and contributed only 0.60% of average start-up finance. Trade credit was rarely used by entrepreneurs. Indeed, only 1.11% of entrepreneurs used trade credit at start-up and this source similarly contributed only a very small percentage of start-up finance at 1.14%, on average.

The regression results presented in chapter 6 found evidence to support hypothesis H1. Product innovators, as well as administrative and distribution innovators, were found to be more likely than their non-innovating counterparts to have used own funds as a source of start-up finance.

Additionally, there was evidence to support hypothesis H2. Market and also administration innovators were more likely than their non-innovating counterparts to have used partners as a source of start-up finance. Process innovators and distribution innovators were more likely than non-process innovators and also non-distribution innovators to have used ordinary shares at start-up. All six of the input measures of innovation were found to be more likely to have used bank loans and overdrafts at start-up.

The logistic regression models presented and analysed in chapter six showed that several other variables were statistically related to the probability of the businesses having used own funds at start-up. Family businesses were more likely than non-family businesses, and exporters were more likely than non-exporters to have used own funds at the start-up stage. Family businesses were less likely than non-family businesses to have used partners' funds or ordinary shares, at start-up. Exporters were more likely than non-exporters to have used partners' funds at start-up.

### **9.2.2 Applications and success in accessing finance and levels of awareness of sources of finance (chapter 7)**

The results presented in chapter seven offers a unique insight into the state of access to finance in Beijing. There is no other similar study which has simultaneously utilised a large and robust data set and also looked at the level of access to finance in such detail, by source. The data showed 89.23% of firms applying to partners or working shareholders received a full or a reduced amount of finance and 78.23% of firms applying for short-term bank finance received the full or a reduced amount of finance. This was ten per cent higher than the corresponding value of 68.42% for factoring or invoice discounting firms. In contrast, only 55.38% and 40.91% of firms applying for bank loans and grants, respectively, received either the full amount or a reduced amount of finance. For two sources of finance – external equity and bank overdrafts the proportion of firms receiving either a full or a reduced amount of finance was very low at 29.63% and 26.87%, respectively.

In the regression models which looked at applying for external finance from bank overdrafts, short-term and long-term bank loans, there were some strong results. Process, work, supply, administration and distribution innovators were more likely than their non-innovating counterparts to have applied for bank overdrafts at the 0.10 level, or better.

Product, process, work, supply, administration and distribution innovators were more likely in comparison with their corresponding non-innovating firms to have applied for long-term bank finance at the 0.10 level, or better.

Supply, markets and distribution innovators were more likely than the non-innovating firms with regard to those three types of innovation to have applied for short-term bank finance at the 0.10 level or better.

Thus, with regard to the three types of bank finance the results of the multivariate regression models are very supportive of hypothesis H3.

In the regression models which looked at applying for external finance from equity, all of the input measures of innovation were statistically significantly related to the applying for equity finance, and this was at the 0.05 level or better (Table 8.13). The output measure of innovation as represented by a series of dummy variables to capture R&D expenditure were also predominantly statistically significant at the 0.10 level or better. Thus, with regard to equity finance the results are very supportive of hypothesis H3.

In the regression models which looked at applying for external finance from grants, factoring and invoice discounting firms and partners, all of the input measures of innovation were positively statistically significantly related to the applying for grants, factoring and invoice discounting firms, and partners and working shareholders at the 0.10 level or better, with the two exceptions of administration

innovation against grants, and process innovation against factoring and invoice discounting firms which were not statistically significant at the 0.10 level or better (Table 7.13). The output measure of innovation, R&D expenditure, was found to be statistically significantly related to the applications for partners and working shareholders, and factoring and invoice discounting firms at the 0.01 and 0.05 level, respectively.

The analysis of the multivariate regression models showed that innovation was not the only characteristic of the firms or the owner-managers which was related to applying for external finance. In general, applications for external finance was positively related to larger and older firms, exporters, and negatively related to owner-managers' age and being a family business. Thus, cultural concerns and the desire to maintain control of firms and not to reveal detailed financial information to external sources still represents a barrier which needs to be overcome.

The hypothesis H4 predicted that the innovative ventures would possess a greater likelihood of having been refused access to external finance in comparison to the non-innovating ventures. The logit models estimated in Tables 7.14 and 7.15 each have successful applications as the dependent variables so if the results were consistent with hypothesis H4 we would expect the odds ratios on the innovation dummy variables to be less than one and to be statistically significant. However, in most instances where innovation is found to be statistically significant, the magnitude of the innovation odds ratios was substantially greater than one. More specifically, in model 9 which dealt with bank overdrafts the product and also distribution innovation variables are both highly statistically significant at the 0.01 level, and the odds ratios were 7.9 and 8.6, respectively.

In model 10 which looks at the likelihood of success in applying for long-term bank loans the product, process and supply innovation variables were statistically significant at the 0.01, 0.10 and 0.01 levels, respectively. Again the odds ratios are all well above one. In contrast for short-term bank finance only one innovation variable – distribution - was found to be weakly statistically significant at the 0.10 level.

Model 12 presented the results for applications for external equity and market innovators was statistically significant at the 0.05 level. The odds ratio for market innovators was 5.9, and again this magnitude is counter to our predictions. Again the innovating firm has a higher probability of being successful in comparison to the non-innovating firms.

In model 13, the dependent variable was success in applications to grants. One measure of innovation – distribution innovation - was found to be statistically significant at the 0.05 level, and the odds ratio was 0.06 which is consistent with hypothesis H4. This was the sole example where a measure of innovation in the regression models was consistent with hypothesis H7.

In model 14, was concerned with factoring or invoice discounting firms and none of the measures of innovation were found to be statistically significant at the 0.10 level, or better. Finally, model 15 reported the results for partners or working shareholders. In this model, supply innovation and distribution innovation were found to be statistically significant at the 0.10 and 0.05 levels, respectively. The odds ratios were found to be 2.6 and 3.5 for supply and distribution innovation.

Thus, overall the regression results reported in Tables 7.14 and 7.15 found evidence which was not supportive of hypothesis H4 when the research was explored using a multivariate regression model.

Given the need for the Chinese government to prolong the period of economic advancement and development, there is the corresponding need to tap the resources and the potential of innovative firms and the results suggest that the banks are surprisingly receptive to innovative ventures. Instead the results and the strong positive relationships between the age of the owner-managers and also the size of the firms with the probability of having successful applications and receiving either the full or the reduced amount suggest that the banks need to be encouraged to overhaul their appraisal systems and their criteria. Given the relationship of the Chinese government to the banks this is possible. Clearly, the younger owner-managers and those running the smaller sized firms are adversely placed in comparison to the older owner-managers and the larger sized firms.

The evidence in the cross-tabulations compared to the regression models provided a contrasting picture of support for the fifth hypothesis, H5. The cross-tabulation analysis found that for equity finance the awareness of these sources was statistically related to innovation activity – product, process, supply, administration and distribution. The most striking feature of Table 7.16 is the very few instances where the characteristics of the owner-managers or the businesses were statistically significantly at the 0.10 level, or better, related to the probability of the firms being aware of the sources of finance. Table 7.16 presents result with product innovation included as the measure of innovation. Product innovation was not statistically significant at the 0.10 level or better in any of the models. When product innovation was replaced in turn with each of the other types of innovation, none of the measures of innovation were found to be statistically significant. Accordingly, the view was taken not to report the tabulation of the odds ratios of the other measures of innovation as there are no statistically significant relationships. Thus, the results in

the multivariate regression models show that whether a firm is an innovator, or is not an innovator, is not systematically related to the firms being aware of risk capital sources, or any of the other sources of finance. Thus, the regression results present evidence which is not supportive of hypothesis H5.

### **9.2.3 The financing of small firms in Beijing, China: Exploring the extent of credit constraints (chapter 8)**

Overall, on average the firms seeking external finance received 65.86% of the finance which they were seeking. Thus, firms on average received approximately two thirds of the finance which they sought. The average amount of external finance sought was 951,892 yuan which approximated to \$126,792 (based on an exchange rate of 1 yuan = \$0.1332, calculated at October 1<sup>st</sup> 2007). The average amount of external finance received was 579,044 yuan which approximated to \$79,126.

The bivariate results suggested that with regard to the 8 measures of innovation only the percentage of turnover spent on R&D dummy variables was statistically significant at the 0.1 level, or better against the percentage of money received from that sought and this was statistically significant at the 0.05 level. The tobit regression techniques were used to investigate the percentage of money received from that sought and to test hypothesis H6. The multivariate regression results with regard to innovation were consistent with the bivariate results. Taken together the results suggest that in Beijing the external sources of finance such as banks have difficulties evaluating projects which are innovation based.

The regression results in Table 8.7 demonstrate that innovative firms are more likely to seek more external finance than non-innovators and this applied to work,

supply, markets, administration, and distribution types of innovators. However, there were no statistically significant differences between product innovators and their non-innovative counterparts, and between process innovators and their non-innovative equivalent, with respect to the amount of external finance sought. The input measure of innovation – R&D expenditure - was not statistically significant, and this applied to when R&D was captured as a series of dummy variables and also as a continuous variable.

In the eighth hypothesis it had been expected that the innovators would receive a smaller amount of external finance compared to the non-innovators. However, in the bivariate and also the multivariate regression analysis several types of innovators – work, supply, administration and also distribution - received a greater amount of external finance than their non-innovating counterparts. This result is difficult to explain. Perhaps the innovating businesses have been more forceful and persistent and this has ultimately overturned some of the prejudices of financial investors.

### **9.3 Theoretical and Practical Implications of the Findings of the Study**

This study has endeavoured to provide a contribution at both the theoretical level and the practical level to our understanding of the financing of small businesses in Beijing. A large scale empirical survey was undertaken with co-operation from certain Tax Offices in Beijing to extend our knowledge of entrepreneurship and finance using human capital theory and theories of finance such as pecking order theory and agency theory.

Whilst there is a very substantial body of research on entrepreneurship and finance from developed nations such as the UK and the US there is a lack of such

studies concerning China, particularly studies which have employed large scale data sets and then utilised econometric techniques. Moreover, previous studies have also generally lacked a meaningful set of characteristics of the entrepreneurs and their businesses which can allow more rigorous analysis of which variables are drivers in explaining access to finance in China.

Overall, the findings provide support for the pecking order theory and confirmed that SMEs at start-up stage rely heavily on internally generated funds which include the owner's personal savings, and capital raised from business partners and / or shareholders. Financing is also received from close relatives and friends which makes this source of capital the next on the list of the pecking order. In line with previous studies, bank loans is by far the widest used external source of finance and almost 100% of the sample respondents are fully aware of this form of financing. Even without conclusive investigation, the increasing awareness and use of bank financing shown in this study compared to previous research still suggest that the environment of the Chinese financial market is in fact improving.

The present study contributed some controversial but meaningful evidence to the issue of the financing of innovative firms in Beijing. Findings suggest that innovators are more likely to apply for greater amounts of external finance and also to receive greater amounts of finance than non-innovators. If the relative proportion of sought finance obtained is taken into consideration, this study has found no evidence of innovative firms being more credit rationed than their non-innovative peers. Yet, the fact that R&D expenditure has a negative impact on the successfulness of obtaining finance exposes the existence of possible hidden problems. Broadly speaking, the implications of such findings in the light of policy-making suggest current regulations addressing the credit rationing problems associated with

innovative firms have been proven to be effective. However, as far as the small businesses sector is concerned, the persistence of credit rationing can only do harm to the development of this thriving but vulnerable sector of the economy,

Moreover, social networking is demonstrated to be a vital and distinctive feature of the customs and practices of doing business in China. Findings show that older owner-managers with a greater level of business experiences, higher attainments in education, more social capital to utilise and better financing skills are more likely to take advantage of a variety of sources of finance. Younger entrepreneurs who have a relative role model could also potentially benefit from the widened social circle through family ties. The findings of this study imply the need to highlight the important role played by relationship lending, in situations not limited to obtaining finance from banks and factoring companies.

The findings again reinforced the necessity for Chinese policy makers and practitioners to put appropriate measures in place to resolve the access to finance problem confronted by the SME sector. Financing constraint is a serious issue that hinders both current development of the Chinese private sector and the long-term strategic planning of the country's economy as a whole. The regulator would need cooperation from all stakeholders, in particular the entrepreneurs and finance providers, to be able to examine and re-examine current obstacles faced by small businesses and to propose feasible solutions in this ever-changing global economic climate. In the following section, the researcher proposes a few practical recommendations to address some of the problems related to financing that are raised in the research findings.

## **9.4 Recommendations**

### **9.4.1 Increasing the level of awareness**

The Chinese Government needs to increase the level of awareness and understanding of equity finance in Beijing and China by entrepreneurs as a whole, but especially those entrepreneurs without degrees, the non-exporting firms, the non-innovators, and entrepreneurs at both ends of the age spectrum – those aged 18-30 and also those aged  $\geq 56$  years old.

Additionally, the Chinese Government should raise the level of general understanding of bank overdrafts, but especially targeting young firms aged 1-5 years, and registered businesses.

The level of awareness and understanding of grants needs to be raised. Whilst the questionnaire did not differentiate between local and national grants it would be prudent for the national and local government to better publicise and disseminate the availability of grants and assistance and how to qualify for and apply for such grants. Not only does the overall headline level of awareness need to be raised but also it needs to be targeted at the young entrepreneurs of 18-30 years of age and also the older entrepreneurs aged  $\geq 56$  years old.

More specifically, the Chinese Government should aim to heighten the level of awareness of equity finance from the reported 62%, of bank overdrafts from 83%, of grants from 75% and of factoring and invoice discounting from 77%. The level of awareness of equity finance should have a target of 80% over a one year period and towards 90% over a three year period. Equity finance is one of the potentially more complicated and difficult types of finance to convey to Chinese entrepreneurs, especially when considering with the entrepreneurs' reluctance to contemplate, let alone apply for equity finance. But, as a method of providing finance and of

continuing China's impressive growth record, the awareness of equity finance needs to rise. Also a policy consideration for the Chinese government should be to improve the level of awareness of grants, from 75% to 85% over a one year period and 90% plus over a three year period. Provided that the number of grants available, and particularly the branding of such grants and agencies providing the grants remains constant then, this would provide a stronger environment to achieve the objectives. However, factoring and invoice discounting types of products are a comparatively straightforward type of finance and the level of awareness should be increased from 77% to 85% over a one year period, and to 90% plus over a three year period.

#### **9.4.2 Sources of finance utilised**

Equity finance can offer an alternative route for businesses in China instead of the more traditional term debt finance from banks. It is recommended that the Chinese Government provides workshops and seminars on equity finance as a practical measure to increase the level of awareness and understanding of equity finance.

Such workshops would need to have at least one presenter who has had practical experience of using equity finance.

It is also recommended that the Chinese Government should aim to increase the level of awareness and understanding of bank overdrafts, grants and factoring and invoice discounting which could also be facilitated in seminars and workshops. Not all types of finance are going to be appropriate at all times in a businesses' life. However, a lack of knowledge about the aforementioned forms of finance has, this researcher believes, possibly hindered Beijing businesses' capacity to apply for and then secure finance and to operate more effectively.

The Chinese Government should contemplate commissioning a ‘Types of Finance Available in Beijing for Business’ document which presents and explains in simple layman’s language what is involved with the full range of the varied types of finance. This should include plenty of easily understandable examples and case studies so that the businesses could clearly see what each of the different types of finance can contribute to their own business, and the benefits as well as the limitations or consequences of utilising specific types of financial sources.

Such a document could initially be focused upon the city of Beijing and some carefully selected regions of China. If the policy initiative was well received then the scheme could be rolled out to each of the other provinces of China.

The Chinese Government also should consider the commissioning of a companion document ‘Understanding Public Sector Support for Businesses in Beijing’ which in layman’s terms would outline the range of public sector sources of grants, as well as more broadly, the full range of national and local sources of advice and assistance so that the business community becomes better informed. Such a document would need to be regularly updated and it would then serve as a way of businesses in Beijing to keep abreast of what is available.

It is also recommended that the Chinese Government websites, such as China International Cooperation Association of Small and Medium Enterprises (<http://www.chinasme.org.cn/>) and the information platform set up by the Beijing Government for SMEs (<http://www.bjsme.gov.cn/>), should provide access to the ‘Types of Finance Available in Beijing for Business’ and ‘Understanding Public Sector Support for Businesses in Beijing’ documents are clearly signposted and that they can be easily downloadable.

### **9.4.3 Reduce the amount of information asymmetry**

The front-end chapters of the dissertation showed that there is a substantial theoretical and also empirical corpus of scholarly research which has shown that information asymmetries can cause problems for entrepreneurs seeking to access external finance. The three empirical chapters of the dissertation have confirmed that information asymmetries are indeed a problem in Beijing. In order for the information asymmetry problem in Beijing to be alleviated there are several measures which the Chinese government could contemplate.

Firstly, there needs to be a more complete and full return of information pertaining to revenues generated and to existing borrowings. This information gathering needs to be not just mandatory, but actively enforced by regulators.

Secondly, Chinese business people need to be more willing to volunteer information to others outside of their businesses. Whilst there is a culture of retaining information within the family and a reluctance to divulge information there needs to be a sea change in the attitude of the entrepreneurs. This is because mandatory enforcement of information disclosure can only go so far, even in China.

Thirdly, the pace of reform of the property rights system, and in particular the increase of enforcement of property rights and the legal framework to gain restitution needs to be rapidly increased. This would then serve lender and borrower alike. But, a system in which business people can misappropriate or abscond with financiers' money is not conducive to finance flowing to entrepreneurs and their businesses.

## 9.5 Contributions

This study has sought to make several contributions. Firstly, this research has added to both the theoretical and the empirical foundations of entrepreneurial finance of Beijing, one area of an emerging or developing nation of China, whereas previous research has instead been generally grounded within a North American and European context. Then guided by insights from the well established human capital theory, the researcher has tested linkages between the specific facets of human capital – innovation, and the control variables of the entrepreneur’s human capital and the firm’s resource profile, and a series of finance related hypotheses. The finance areas which were investigated included: the propensity of the Beijing respondents to utilise specific sources of finance at the start-up stage, and also their levels of awareness of sources of capital; the amount of finance sought, the amount of finance received, and the proportion of finance sought which was received. This was also balanced with an investigation of whether entrepreneurs were able to access finance per se, and from which specific sources of finance.

Secondly, the dissertation has offered new insights relating to the contributions made by innovating firms to address barriers to the accessing and acquisition of external finance. This included a good range of types or facets of innovation which capture output measures of innovation, as well as R&D expenditure as an input measure of innovation. This has allowed the researcher to have a better insight into the extent and the nature of how innovation can hinder entrepreneurs’ access to finance.

Thirdly, the researcher has made an empirical contribution by gathering a unique large scale data set of 452 entrepreneurs and using a combination of cross-

tabulations and advanced econometric techniques to test eight hypotheses related to access to finance in Beijing.

This notwithstanding the undertaking of the research for this dissertation has been a long journey and now standing back and looking at the project there are clearly limitations which need to be acknowledged, as well as to identify the implications of this researchers contributions and findings for development in future studies.

### **9.6 Limitations of the study and implications for further research**

The bulk of the empirical contribution of the dissertation has revolved around the primary data of the responses of entrepreneurs in the Beijing area of China, which was harvested through a carefully crafted questionnaire. Doubt could be raised about the wider validity of the selected dependent and independent variables which were used in chapters six to eight. However, the researcher undertook steps to minimize as far as possible the common method bias (Krishnan et al., 2006) and this included providing the entrepreneurs with anonymity, the careful development of the questions and their piloting to minimize statement ambiguity, as well as the translation of the questionnaire from English to Chinese, and then the back-translation to ensure that the questions were as robust as humanly possible. Additionally, all of the variables were included in a principal components analysis. The Harman one-factor test (Podsakoff et al., 2003) suggested that there was no evidence of a common method bias. Moreover, other studies have argued that individual respondents can offer and provide reliable information about their businesses (Westhead and Storey, 1997; Westhead et al., 2005a; 2005b; 2005c; Wright et al., 2008). To respect the Chinese business culture, the provision of information about social capital was not sought in this study because of the recognized unwillingness of respondents to divulge such details.

This study has gathered the responses from entrepreneurs from only one region of China, Beijing, and clearly in the generalizing on the state of finance there could be dangers. Beijing has a number of distinct differences from other regions of China, being the capital of China and as such is at the heart of this large nation's government. There are several top universities located in Beijing and the most famous ones include Tsinghua University, Peking University and Renmin University. Beijing offers plentiful human capital resources and financing channels to market entrants and is the most important base for business incubators and science parks which are keen to promote new innovative ventures in China.

Whilst this researcher has raised policy issues for the Chinese government it is clear that in order for policy makers and practitioners to develop the most appropriate and beneficial policies towards entrepreneurs in other regions of China, particularly pertaining to innovation policies, further research must be conducted on each of China's regions. Because regional policies and regulations can vary, it is sensible to conduct future studies on regions that receive special policy attention, such as the five special economic zones (namely ShenZhen, Zhuhai, ShanTou, XiaMen and HaiNan), in the central part of China and the western parts of China. This notwithstanding, given that Beijing has a population of approximately 260,000 businesses and a human population of 16 million people, it is clear that with 452 respondents the confidence interval of the results obtained from the researcher's study is 4.61 which is well within accepted limits (Freel and Robson, 2004).

However, future studies should clearly roll out the survey to the other areas of China. Whilst this study placed an upper limit of 500 employees to partly allow better comparisons with previous western studies it would be interesting to raise this limit to reflect the fact that the official definition of SMEs in China is up to 3000 employees.

Additionally, whilst this study was large at 452 firms it would be important to further increase the sample of respondents to allow the results to be meaningfully broken out by detailed standard industrial classifications.

The quantitative research, whilst providing robust statistical information, can only go so far in understanding the nature of access to finance in Beijing. In order to be able to more completely tell the story of access to finance in Beijing there is clearly a need to also undertake qualitative research using detailed case studies and interviews.

To further advance the research in entrepreneurship and to catch up with the pace of globalisation, it is intriguing to look beyond China and to investigate the similarities and differences between emerging nations. More specifically, India, which is seen as the most comparable competitor of China, plays an equally important role in the current global economy and it would be very interesting to explore and compare obstacles faced by SMEs in both countries, in particular, the access to finance (Ahya and Gupta, 2010).

Like China, India has enjoyed substantial economic growth for more than two decades. Access to finance remains the toughest challenge for small businesses in both countries. Notwithstanding the desperate needs of financing from the private sector, it is suspected that the development of an efficient and well-functioning financial market falls far behind the speed and extent of the economic growth in the emerging markets in general. Hence, this is a worthy subject for further studies and a comparative study between the financial systems of China and India against the extent of financing difficulties encountered by SMEs could be fruitful.

Furthermore, it is also interesting to see how beneficial it would be to have a better designed and enforced institutional setting which can improve the financing

environment for SMEs. China is still in the transitional stage from a socialist system to a market-based system and there is insufficient legal protection for investors. In contrast, India has a judicial system set up by the British (based on English common law) for more than 200 years and has had a democratic government in power since 1949. It is believed that having a stricter and more sophisticated legal environment should make access to finance easier for SMEs that are genuinely good in terms of their innovativeness and potential to grow, because of the protections in place to safeguard investors' and lenders' capital. In addition, India is a step ahead of China in standardizing lending to small businesses, having the Fair Practices Code issued by the Small Industries Development Bank of India (SIDBI) ([www.sidbi.com](http://www.sidbi.com)). All financial institutions are able to follow the code in order to ensure loan applications, appraisals and disbursements procedures are clarified and standardised. Thus, SIDBI's rich experiences in lending to SMEs can be transferred to other finance providers and the willingness to approve loan applications made by SMEs would be enhanced (Allen et. al., 2009). However, at present in China, state-owned banks, which lack the intention to promote SMEs and suffer severe information problems, still dominate the financial market.

Further research on China and comparative studies embracing more emerging nations (i.e. India, South East Asia and South Africa) are extremely valuable, not only from the policy-making point of view, but also for the benefit of the whole SME community, which is seen as the engine driving the economic development for the future. All in all, a combination of both quantitative and qualitative methods, if possible, would be most useful in delivering meaningful results for policy makers and practitioners.

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**University of Durham**

**Centre for Entrepreneurship**

**Survey of Small Business in China**

**2007**

**This survey is prepared to gain a better understanding of the problems faced by small businesses in China.**

**All the information which you provide will be kept confidential and anonymous, and will be used only for academic research.**

## SECTION A

### INFORMATION ABOUT YOUR CHARACTER AND THE BUSINESS

A1. Please indicate whether you are:            Male            Female

A2. What is your age?

A3. What is your position in the company?

A4. Which of the following educational qualifications do you have?  
(Please circle appropriate box/es).

Middle School or less	Yes	No
High School	Yes	No
Technical / Vocational / Apprenticeship	Yes	No
Diploma	Yes	No
Bachelors degree	Yes	No
Professional qualification (i.e. Accountancy/Law)	Yes	No
Masters degree or above	Yes	No
Others (Please specify)	Yes	No

A5. What motivated you to start the business? (Please circle appropriate box/es).

Desire to work for oneself	Yes	No
Due to redundancy	Yes	No
Frustration in previous employment	Yes	No
Wish to accumulate wealth	Yes	No
An excellent opportunity presented itself	Yes	No
Relative in business	Yes	No
Previous experiences prepared me	Yes	No
Others (Please specify)	Yes	No
	Yes	No

A6a. Have you had any previous experience in business?

Yes	No
-----	----

A6b. If “Yes”, please specify for how long?

A7a. Has any member of your family been involved in business in the past?

Yes	No
-----	----

A7b. Is this business related to your current business activities?

Yes	No
-----	----

A8. In which year did you establish your business?

A9. What percentage of the business is owned by you and your family?

A10a. Is there any Foreign Direct Investment (FDI) in your business?

Yes	No
-----	----

A10b. If “Yes”, what percentage of your capital is from FDI?

A11. What does your business make / provide?

A12. Is your company a subsidiary of another company?

Yes	No
-----	----

A13. Is your company a holding company of other firms? 

Yes	No
-----	----

A14. Do you currently employ any member of your family in the business? 

Yes	No
-----	----

A15. During the last three years, which of the following factors listed below, do you perceive as hindering or limiting your ability to meet your business objectives?

*(Please circle the appropriate number in each row).*

Factor	Not Important Limitation	Moderately Important Limitation	Important Limitation	Crucial Limitation
<b>Finance:</b>				
Inadequate access to debt finance	1	2	3	4
Inadequate access to equity finance	1	2	3	4
Interest rates too high	1	2	3	4
Do not have collateral to secure bank loan	1	2	3	4
Difficult to meet loan criteria	1	2	3	4
Inadequate family finance	1	2	3	4
<b>Market:</b>				
Inadequate demand	1	2	3	4
Too many competing firms	1	2	3	4
Competition from imported goods	1	2	3	4
High advertising costs	1	2	3	4
Inadequate market research	1	2	3	4
<b>Managerial/ Technical Know-how:</b>				
Shortage of skilled labour	1	2	3	4
Access to new technology	1	2	3	4
Inadequate financial skills	1	2	3	4
Inadequate management skills	1	2	3	4
Inadequate marketing skills	1	2	3	4
<b>Inputs</b>				
High cost of local raw materials	1	2	3	4
High cost of imported raw materials	1	2	3	4
Inadequate supply of raw materials	1	2	3	4
High cost of replacing old equipment	1	2	3	4
Poor quality of local raw materials	1	2	3	4
Poor quality of imported raw materials	1	2	3	4
<b>Economic/Regulatory</b>				
High rate of inflation	1	2	3	4
High pressure for Yuan to appreciate	1	2	3	4
High various taxes and duties	1	2	3	4
Registration / Licensing / Red tape	1	2	3	4
Corruption	1	2	3	4
<b>Infrastructure</b>				
High cost of utility charges	1	2	3	4
Lack of industrial sites	1	2	3	4
High transport costs	1	2	3	4
Low quality of electricity / water supply	1	2	3	4
Poor telecommunication networks	1	2	3	4

A16. What is the type of legal organisation of your business?  
*(Please circle appropriate box).*

Registered sole proprietorship	1
Partnership	2
Private limited liability	3
Others (Please specify)	4

A17. What percentage of the business is owned by other people; and who are they?

A18. Where do you sell your products? Please indicate the percentage of sales in each market. *(Please circle appropriate box/es).*

Type of Market	Do you sell in this type of market?		Percentage of Sales
	Yes	No	
Local market	Yes	No	
National market	Yes	No	
South East Asia market	Yes	No	
International market- Europe	Yes	No	
International market- US	Yes	No	
Others (Please specify)	Yes	No	
Total			=100%

A19. How much is the registered capital of your firm?

A20. Has your company got limited liabilities?

Yes	No
-----	----

A21. Please provide the following information of your firm.

	Year			
	2003	2004	2005	2006
No. of employees				
Fixed assets after depreciation				
Sales				
Profit before taxation				
Long-term investments				
Short-term debts				
Debentures				

## SECTION B INNOVATION AND PERFORMANCE

Innovation is concerned with the application of new ideas. Often these ideas take the form of new products and services or new production processes. However, innovation may also refer to new work practices and workforce organisation, to new sources of supply or materials (or new ways of working with key suppliers), to the exploitation of new markets or means of reaching those markets (including innovations in marketing, selling and distribution) and to new administration and office systems. In the following section we would like you to tell us about innovation introduced into your business. Unless otherwise specified, the term innovation should be taken to encompass any of the categories described above. However, innovations should involve substantive changes.

B1. In which area(s) of the business have you carried out innovation(s)?  
(Please circle the appropriate response on each line).

	No Innovation	Innovation new to firm	Innovation new to industry
In products or services	1	2	3
In production processes (including storage)	1	2	3
In work practices, or workforce organisation	1	2	3
In supply and supplier relations	1	2	3
In markets and marketing	1	2	3
In administration and office systems	1	2	3
In products or services distribution	1	2	3

B2. Approximately what percentage of your firm's annual turnover was spent on research and development (R&D) and innovation related activities (e.g. marketing, design, better production capabilities) during the last 3 years? If zero, please indicate nil.

2004 \_\_\_\_\_ 2005 \_\_\_\_\_ 2006 \_\_\_\_\_

B3. What were the main reasons for introducing innovations in the last 3 years?  
(Please circle the appropriate answer in each row).

Reasons	Not Important	Moderately Important	Important	Crucial
To comply with legislation/regulation	1	2	3	4
To respond to competition	1	2	3	4
To meet a specific customer request	1	2	3	4
To enter a new market	1	2	3	4
To diversify the business	1	2	3	4
To maintain sales revenue/market share	1	2	3	4
To increase sales revenue/market share	1	2	3	4
As a result of standardisation (e.g. BS, ISO)	1	2	3	4
Other (Please specify)	1	2	3	4

B4. Who are your main competitors? (Please circle appropriate box(es)).

No competitors	Yes	No
Firms in the local market	Yes	No
Firms in the national market	Yes	No
Firms in international markets– South East Asia	Yes	No
Others (Please specify)	Yes	No

## SECTION C FINANCING

C1. What are the main sources of funding for your business? Please specify the percentage of funds in your business which comes from each of the sources listed below.

Sources of funds	Present (%)	Start-Up (%)
Own funds		
Partner(s) contribution		
Ordinary shares		
Bank loan / overdraft		
Trade credit		
Family contribution		
Others ( <i>Please specify</i> )		
Total	100%	100%

C2. Have you been seeking finance in the past three years?

Yes	No
-----	----

C3. What was the purpose(s) of raising funds?

Fund new project/product line	Yes	No
Innovation	Yes	No
Purchase equipment	Yes	No
Payoff previous loans	Yes	No
Solve insolvency problems/ working capital shortage	Yes	No
Other ( <i>Please specify</i> )	Yes	No

C4. For each of the following, please indicate if you consider them as a potential source of external finance, if you approached them in the last three years and whether the approach resulted in an offer of additional finance.

(*Please circle the appropriate answer in each row*).

Source of Finance	Not aware of this as a source of finance	Did not approach this source for finance	Approached but no finance was offered to me	Approached but was offered less than full amount sought	Approached and was offered the full amount sought
Family and friends	1	2	3	4	5
Bank's Overdraft	1	2	3	4	5
Bank Loan ( $\geq 2$ years)	1	2	3	4	5
Bank Loan ( $< 2$ years)	1	2	3	4	5
Venture Capital Firms	1	2	3	4	5
Business Angels/Private investors	1	2	3	4	5
Hire Purchase/Leasing Firms	1	2	3	4	5
Factoring/Invoice Discounting Firms	1	2	3	4	5
Foreign Direct Investment	1	2	3	4	5
Grants	1	2	3	4	5
Informal Creditors	1	2	3	4	5
Partners/Working Shareholders	1	2	3	4	5
Other ( <i>Please specify</i> )	1	2	3	4	5

C5. Please provide details of each of source of finance listed below.  
 (Please circle as appropriate and leave the cell empty if not relevant).

Source of Finance	No. of times approached	No. of times succeeded	Average time of negotiation	Guarantor required?		Collaterals involved?	
				Yes	No	Yes	No
Family and friends				Yes	No	Yes	No
Bank's Overdraft				Yes	No	Yes	No
Bank Loan ( $\geq 2$ years)				Yes	No	Yes	No
Bank Loan ( $< 2$ years)				Yes	No	Yes	No
Venture Capital Firms				Yes	No	Yes	No
Business Angels/Private investors				Yes	No	Yes	No
Hire Purchase/Leasing Firms				Yes	No	Yes	No
Factoring/Invoice Discounting Firms				Yes	No	Yes	No
Foreign Direct Investment				Yes	No	Yes	No
Grants				Yes	No	Yes	No
Informal Creditors				Yes	No	Yes	No
Partners/Working Shareholders				Yes	No	Yes	No
Other (Please specify)				Yes	No	Yes	No

C6. How much additional finance did you seek and what proportion of this did you obtain?

Amount sought  Percentage obtained  %

C7. Do you consider informal creditors an alternative source of finance?

C8. What do you think are the characteristics of an informal banking system?  
 (Please circle the appropriate answer in each row).

Characteristics	Strongly disagree	Disagree	Agree	Strongly agree
Costly/Expensive	1	2	3	4
Quick access	1	2	3	4
Troublesome	1	2	3	4
Not trustworthy	1	2	3	4
Common practice	1	2	3	4
Other (Please specify)	1	2	3	4

C9. When you seek finance, which factor is of the most concern?  
 (Please circle one answer in each row).

Factors	Not concerned	Moderately concerned	Concerned	Crucially concerned
Speed of getting the money	1	2	3	4
Rate of interest	1	2	3	4
Terms of the loan	1	2	3	4
Relationship with the lender	1	2	3	4

C10a. Does the owner-manager have good relationships with banks? 

Yes	No
-----	----

C10b. If “Yes”, please state with how many banks?

C11. Would you use up retained profits and personal funds before seeking external finance? 

Yes	No
-----	----

C12a. Have any Venture Capitalists approached you before? 

Yes	No
-----	----

C12b. If “Yes”, please name them.

C12c. Have you considered inviting Venture Capitalists to join the business? 

Yes	No
-----	----

C13a. Are you planning to be listed on the stock exchange? 

Yes	No
-----	----

C13b. What would be your main purpose of listing? (*Please tick only one*).

Raising funds	
Better reputation	
Increase competitiveness	
Seeking expansion	
Under pressure from competitors	

C13c. Would equity financing be considered before debt financing? 

Yes	No
-----	----

C13d. For companies raising equity finance only: please provide the following information.

Amount of management time to raise finance (no. of days)	Days
Cost of raising the finance (% of amount raised)	%
% of equity relinquished	%
Location of equity provider (Main town or city)	

C14. Do you have plans to expand the business over the *next* three years?

	<i>(Please tick the relevant boxes)</i>		By what percentage do you plan to grow the business over the next 3 years?
In terms of sales?	Yes	No	%
In terms of employment?	Yes	No	%

C15. Please indicate how likely it is that you will be able to raise the capital required to finance your growth over the next 3 years? (*Please circle one answer in each row*).

	Very unlikely	Unlikely	Likely	Very likely
Retained earnings	1	2	3	4
Loan finance (banks)	1	2	3	4
Equity capital	1	2	3	4
Grants	1	2	3	4

C16. If equity capital is required, please indicate how likely it is that you will consider using the sources stated below? (*Please circle one answer in each row.*)

	Very unlikely	Unlikely	Likely	Very likely
Founders and management	1	2	3	4
Family and Friends	1	2	3	4
Other private individuals (Business angels)	1	2	3	4
VC funds	1	2	3	4
Informal financial institutions	1	2	3	4
Stock market	1	2	3	4
Sale of firm to another company	1	2	3	4
Other sources ( <i>please specify</i> )	1	2	3	4

THANK YOU FOR YOUR COOPERATION ---- **Jia Wang**

**Appendix 5.2**



**University of Durham**

**企业研究中心**

**中国中小企业问卷调查**

**2007**

**本问卷意在更好的了解中国中小企业面临的问题**

**所有您提供的信息都将会是保密的和匿名的，只可用以学术用途。  
谢谢！**

## 第一部分 - 关于您个人和您公司的情况

注：如无特别注明问卷中的“您”代表企业负责人

A1. 您的性别：

A2. 您的年龄：

A3. 填写此问卷的人在本公司的职务：

A4. 请用下表说明您的教育水平。(请圈注所有适当的选项)。

初中或以下	是	否
高中	是	否
技工或学徒	是	否
大专	是	否
大学本科	是	否
拥有专业资格 (例：会计师，律师、、、)	是	否
硕士或以上	是	否
其它(请具体指明_____)	是	否

A5. 什么是您组建这间公司的原动力？(请圈注所有适当的选项)。

希望自己当老板	是	否
由于失业	是	否
在以前的工作中受挫或对工作的不满	是	否
希望积累财富	是	否
因为有一个极好的机会出现	是	否
因为有亲戚在生意上的支持	是	否
有充足的经验和经历做支持	是	否
其它(请具体指明_____)	是	否

A6a. 请问您是否有与现在工作相关的工作经验？

有	没有
---	----

A6b. 如果您选择“是”，请问大概是多长时间？

A7a. 请问您的亲属是否有参与您以往的生意？

是	否
---	---

A7b. 请问您目前的生意是否与以往的有关？

是	否
---	---

A8. 您目前的这家公司是在哪一年建立的？

A9. 请问您的公司的所有权有百分之几是由您个人或家庭成员所控制？

A10a. 您的公司是否有外商直接投资？

是	否
---	---

A10b. 如果“是”，请问有百分之几的资本是由外商提供的？

%

A11. 您的公司的经营项目或所制造的产品是什么？

A12. 您的公司是其它公司的子公司吗？

是	否
---	---

A13. 您的公司是其他公司的母公司吗？

是	否
---	---

A14. 现在有没有您的亲属在您的公司里工作？

有	没有
---	----

A15. 在过往的三年里，您认为以下哪些因素以何种程度阻碍或限制了您的企业商业目标的实现？（请选择每一行一个您认为最适当的数字）。

因素	很小或 没有影响	一般程度 的影响	很大程度 的影响	至关紧要 的影响
<b>资金方面：</b>				
缺乏贷款途径	1	2	3	4
有困难通过股票来融资	1	2	3	4
所获得资金的利息过高	1	2	3	4
贷款时无法提供所要求的抵押品	1	2	3	4
难以达到获得贷款批准的要求	1	2	3	4
家里不能提供足够的资金	1	2	3	4
<b>市场方面：</b>				
市场需求不足	1	2	3	4
参与竞争的企业太多	1	2	3	4
来自于进口货品的竞争	1	2	3	4
广告费用过高	1	2	3	4
进行的市场调查不够充分	1	2	3	4
<b>管理方面：</b>				
缺乏高技术工人	1	2	3	4
获取新技术的途径有限	1	2	3	4
缺乏融资，筹资技巧	1	2	3	4
缺乏管理技巧	1	2	3	4
缺乏市场开拓及销售技巧	1	2	3	4
<b>投入方面：</b>				
原料成本过高	1	2	3	4
缺乏原料供应渠道	1	2	3	4
更换原有旧机械的成本过高	1	2	3	4
<b>经济及政府方面：</b>				
通货膨胀率过高	1	2	3	4
人民币的升值压力较大	1	2	3	4
缴纳的各种税费过高	1	2	3	4
申请各种许可证及执照比较麻烦	1	2	3	4
相关管制部门存在腐败行为	1	2	3	4
<b>基础设施方面：</b>				
电，水等能源费用过高	1	2	3	4
缺少工业用地	1	2	3	4
交通运输成本过高	1	2	3	4
电，水等能源的供应较差	1	2	3	4
通讯网络不畅通	1	2	3	4

A16. 请问您的公司的法律形式是什么？(请只圈注一个最适当的选项)。

私营企业	1
合伙制企业	2
个人有限责任公司	3
其它(请具体指明_____)	4

A17. 您的公司有百分之几是由其他人(除您个人和与您有亲属关系以外的人)所有? 请简略提供这些所有者与您的关系。

A18. 您的公司的产品或服务的销售市场是哪里? 请将销售额的大致百分比也填写在表格需要处。(请圈注所有适当的选项)。

市场	您的商品是否销往该市场或您是否服务于该市场?		占总销售额百分比
	是	否	
当地市场 (以省为单位)	是	否	%
其他中国地区市场	是	否	%
东南亚市场	是	否	%
国际市场(欧洲)	是	否	%
国际市场(北美)	是	否	%
其它(请具体指明_____)	是	否	%
总计			=100%

## 第二部分 - 创新与发展状况

创新是一项新理念的实施。它可以是一种新的产品，一种新的服务方式或是一个全新的生产流程。从广意上来说创新同样可以是新的供货渠道，或是一种新的与供货商打交道的方式。当然新市场的开拓及使用新的市场销售策略或是更新原有的办公管理系统都可以说是一种创新。（除非进行特别说明，创新涵盖了上述我们所有的举例。创新可以说就是一项实实在在的改变。）

B1. 您的企业有过哪些创新，这些创新是哪种程度上的（请在您认为恰当的答案上画圈）

	没有创新	对本企业的创新	对本行业的创新
在产品或服务方面	1	2	3
在生产程序方面(包括货品的存储)	1	2	3
在职工组织和调动职工积极性方面	1	2	3
在货源及与供货商的关系方面	1	2	3
在市场及销售方面	1	2	3
在企业管理及办公系统方面	1	2	3
在货品或服务发送方面	1	2	3

B2. 请给出在过去3年中您的公司用于进行研发及创新的费用占年营业额的分比？

2004\_\_\_\_\_ 2005\_\_\_\_\_ 2006\_\_\_\_\_

B3. 令您的企业在过去三年中有所创新的主要原因有哪些？（请在您认为恰当的答案上画圈）

原因	不重要	比较重要	重要	非常重要	至关重要
为了遵守法律规章及行业要求	1	2	3	4	5
为了更好地参与竞争	1	2	3	4	5
为了达到客户的要求	1	2	3	4	5
为了能够进入新的市场	1	2	3	4	5
为了使得经营多样化	1	2	3	4	5
为了保障销售收入及市场份额	1	2	3	4	5
为了增加销售收入及市场份额	1	2	3	4	5
为了达到某一质量标准（例如BS, ISO)	1	2	3	4	5
其它(请具体指明_____)	1	2	3	4	5

B4. 您认为谁是您的主要竞争对手？（请圈注所有适当的选项）。

没有竞争对手	是	否
本地区(省内)的企业	是	否
国内的企业	是	否
亚洲国家的企业	是	否
其它(请具体指明_____)	是	否

### 第三部分 - 筹资与融资

C1. 您的企业的主要资金来源是什么？请给出相应来源所占企业资金的百分比。

资金来源	百分比(%)	起始资金 (%)
自有资金		
合伙人		
股东参股		
银行贷款或透支		
供货商提供的信用额度		
家庭成员		
其它(请具体给出_____)		
总数	100%	100%

C2. 您在过去三年中是否有寻求过资金？

是	否
---	---

C3. 您需求资金的目的是什么？

开发新的产品或生产线

是	否
---	---

创新

是	否
---	---

购买机械设备

是	否
---	---

偿还以前的债务

是	否
---	---

解决资金周转问题

是	否
---	---

其它(请具体给出\_\_\_\_\_)

是	否
---	---

C4. 对下列给出的各项，请告诉我们您是否认为它是一种潜在的资金来源？另外您在过去三年中是否通过它筹集到过资金。(请在您认为恰当的选项上画圈)

资金来源	从未意识到这是一种资金来源	没有尝试过用这种方式筹集资金	虽尝试过,但没能成功地通过这种方式筹集到资金	通过这种方式筹集到过资金,但少于筹集目标全额	通过这种方式筹集到过资金,并筹集到全额
家人或朋友	1	2	3	4	5
银行透支	1	2	3	4	5
银行贷款(大于等于2年期)	1	2	3	4	5
银行贷款(小于2年期)	1	2	3	4	5
风险投资基金	1	2	3	4	5
创业天使或个人投资者	1	2	3	4	5
租购融资或租赁融资	1	2	3	4	5
应收帐款,质押贷款或票据贴现	1	2	3	4	5
外商直接投资	1	2	3	4	5
政府拨款或扶持	1	2	3	4	5
地下钱庄	1	2	3	4	5
公司合伙人或股东	1	2	3	4	5
其它(请具体给出_____)	1	2	3	4	5

C5. 请提供有关 C4 中列出的资金来源的有关细节 (如有不相关项请留空).

资金来源	尝试筹资次数	成功筹资次数	平均商议持续时间	有无担保人参与		有无抵押品支持	
				有	无	有	无
家人或朋友				有	无	有	无
银行透支				有	无	有	无
银行贷款(大于等于 2 年期)				有	无	有	无
银行贷款 (小于 2 年期)				有	无	有	无
风险投资基金				有	无	有	无
创业天使或个人投资者				有	无	有	无
租购融资或租赁融资				有	无	有	无
应收帐款质押贷款或发票贴现				有	无	有	无
外商直接投资				有	无	有	无
政府拨款或扶持				有	无	有	无
地下钱庄				有	无	有	无
公司合伙人或股东				有	无	有	无
其它(请具体给出_____)				有	无	有	无

C6. 您的筹资和融资目标总金额是多少, 您实际获得的资金占目标融资总金额的百分比是多少?

目标总金额  所获得的百分比  %

C7. 您是否将地下钱庄作为资金的来源之一?

C8. 下列哪些特点你认为是地下钱庄所有的? (请在您认为合适的答案上画圈)

特点	非常不认同	不认同	认同	非常认同
费用高	1	2	3	4
效率高	1	2	3	4
容易产生不必要的麻烦	1	2	3	4
不可信赖	1	2	3	4
已被普遍接受	1	2	3	4

C9. 当您需要资金时, 下列哪一选项是您认为最关注的?(请在您认为适当的选项上画圈)

关注事项	不关注	有一些关注	关注	非常关注
得到资金的快慢	1	2	3	4
支付所借资金的利息	1	2	3	4
还款时间的长短	1	2	3	4
与债权人的关系	1	2	3	4

C10a. 您的企业是否和银行之间有很好的关系

C10b. 如果是的话, 请您给出和多少家银行有很好的关系?

C11. 您是否会在用光了企业自留利润和个人资金之后才会考虑使用外部资金?

是	否
---	---

C12a. 是否有风险投资基金曾经接触过您?

是	否
---	---

C12b. 如果“有”请您给出它们的名字.

是	否
---	---

C12c. 您是否考虑过让风险投资基金加入到您的企业

是	否
---	---

C13a. 您是否考虑过将您的企业上市?

是	否
---	---

C13b. 什么是您打算将企业上市的主要原因? (请仅选择一项)

融资	
提升企业知名度	
增强企业竞争力	
寻求企业扩张	
因为竞争对手的压力	

是	否
---	---

C13c. 您在上市融资之前是否会先考虑使用债务融资(例:贷款)?

C13d. 此问题仅需要已上市的企业回答: 请您给出以下信息 (大概即可)

作为企业管理者您投入到上市这一事件的时间(天数)	天
融资成本占所融资总金额的百分比	%
准备上市流通的股份占总股份的百分比	%
在哪一个证券交易所上市	

C14. 您是否有计划在未来的三年内扩张企业的规模?

扩张方向	(请在您认为适当的选项后打勾)		以百分比计算未来三年您的成长目标是多少?
增加营业额	是	否	%
雇佣更多的员工	是	否	%

C15. 您预期在未来三年您会以下列哪一种方式来进行筹资或融资用于企业的扩张?

(请对每一种筹资或融资方式仅给出一种可能性)

方式	非常不可能	不太可能	有可能	非常有可能
企业自留利润	1	2	3	4
银行贷款	1	2	3	4
股本融资	1	2	3	4
政府拨款	1	2	3	4

C16. 如果您将进行股本融资，请您从以下选项中选出可能的股本融资方式。  
 (请对每一种股本融资方式仅给出一种可能性)

股本融资方式	非常不可能	不太可能	有可能	非常有可能
企业创立者及管理层	1	2	3	4
家人或朋友	1	2	3	4
私人投资者(例如创业天使)	1	2	3	4
风险投资基金	1	2	3	4
底下钱庄	1	2	3	4
股票市场	1	2	3	4
向其它公司出售部分企业所有权	1	2	3	4
其它方式(请具体给出_____)	1	2	3	4

非常感谢您对本次问卷调查的支持与合作

## Appendix 8.1: Letter short-listing the paper for Small Business Economics

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From: Domingo.Ribeiro@uv.es [Domingo.Ribeiro@uv.es]  
Sent: 07 July 2010 12:48  
To: Robson, Paul J  
Cc: thurik@ese.eur.nl; pacosole@telefonica.net; domingo.ribeiro@uv.es  
Subject: INBAM 2010-Small Business Economics Track

Dear Paul

After a very successful INBAM 2010 conference which introduced a new model of communication between prospective producers of scientific papers and the editorial staff of several leading journals, it is now time to select the best material.

In this process we consulted many eminent advisors since choices are of great importance for both sides. In the case of "Small Business Economics" we selected 7 out of 16 papers. We are happy to announce that your paper "The Financing of Small Firm Innovation in China" is one of these 7 papers. For this choice editors of several of the journals joined forces and wrote the "INBAM suggestions for paper submissions to Journals" of which we attach the SBE version. We now ask you to work up your paper according these guidelines and send in the next version before September 1. You may want to do so in a very serious fashion because this version of your paper will then enter the referee process of SBE. Possibly some of your papers might not be accepted in this process.

At this moment we do not guarantee acceptance but we feel that if - in a joint effort - we manage to improve the set of selected papers, a very interesting special issue of SBE may be brought out. In a later stage you will receive instructions where to send the next version of your paper.

With best wishes

David Audretsch (Editor SBE)  
Roy Thurik (Associate Editor SBE)  
Francisco Sole-Parellada (guest editor SBE-for-INBAM 2010)

**Appendix Table 8.2: Relative Sectoral Distribution of Firms**

<b>Activity</b>	<b>SIC 2003</b>	<b>Number of Respondents</b>
Food Products, Beverages & Tobacco	15, 16	9
Textiles/Wearing apparel/Leather	17, 18 19	63
Wood/Paper	20, 21	4
Publishing & Printing	22	5
Chemicals/ Rubber & Plastics/ Non-metallic minerals	24, 25, 26	47
Metals/ Metal Fabrication	27, 28	39
Machinery & equipment NEC	29	19
Office machinery/ Electrical machinery/ Precision instruments/ Radio, Television and Communication Equipment/ Precision instruments	30, 31, 32, 33	11
Motor Vehicles	34	8
Furniture	36	19
Manufacturing Total		224
Wholesale Trade; Repair of Motor Vehicles	50, 51	65
Land Transport	60	5
Real Estate Activities	70	14
Computer and Related Activities	72	25
Research and Development	73	8
Other Business Activities	74	43
Services Total		160
Response Total		384

**Appendix Table 8.3: Descriptive statistics and ANOVAs.**

	Mean	S.D	n
<b>Control Variables</b>			
Sector - Manufacturing	41.67%		224
Services	58.33%		160
Size	57.943	73.279	384
Age of Business	7.776	6.054	384
<b>Entrepreneur Social Capital</b>			
Family Business	46.35%		178
Non Family Business	53.65%		206
<b>Demographic Characteristics</b>			
Sex – Male	78.12%		300
Female	21.88%		84
Age of Owner-Manager	40.508	8.174	384
Relative Role Model	36.46%		140
No Relative Role Model	63.54%		244
<b>Type of Business</b>			
Registered Business	43.23%		166
Partnership	22.92%		88
Limited liability	33.85%		130
<b>General Human Capital</b>			
Degree	49.22%		189
No Degree	50.78%		195
<b>Specific Human Capital</b>			
Exporter	27.86%		107
Non-Exporter	72.14%		277
Innovator – Product	77.34%		297
None	22.66%		87
Innovator – Process	40.62%		156
None	59.38%		228
Innovator – Work	48.44%		186
None	51.56%		198
Innovator – Supply	42.97%		165
None	57.03%		219
Innovator – Markets	63.02%		242
None	36.98%		142
Innovator – Administration	42.45%		163
None	57.45%		221
Innovator – Distribution	43.49%		167
None	56.51%		217
R&D Expenditure as a % of turnover:			
None	10.94%		42
1-2%	34.90%		134
3-5%	26.04%		100
6-10%	15.63%		60
11-20%	8.07%		31
≥21%	4.43%		17

n=384