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# ARE THERE GENDER DIFFERENCES IN THE PERFORMANCE OF CHINESE ENTREPRENEUERS?

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CONTENTS

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## Abstract

The author analyzes the differences between Chinese female entrepreneurs and their male counterparts and also looks at how these differences affect company performance. The author's study shows that Chinese female entrepreneurs are more risk averse, have less horizontal social capital, are less innovative and make more major decisions by themselves, compared to their male counterparts. There is no gender difference in economic resources, human resources or vertical social capital, except that there are more women involved in party membership. However, only the female's management style is found to be significantly negatively correlated with performance. Further study on performance should focus on gender-similar traits of Chinese entrepreneurs rather than gender-difference. And female entrepreneurship should be promoted in China for inclusive social development.



**Keywords:** Female entrepreneurs, gender difference, gender performance, Chinese female entrepreneur


## 1. Introduction

### 1.1 Background

"More than half of the world's richest self-made women are Chinese", according to the Hurun Report, which compiles information on the wealthiest Chinese, "the world's richest women are Chinese—as 11 out of 20". [1] In 2006, the top person on

[1] Financial Times: http://www.ft.com/cms/s/0/e66c3a8a-d559-11df-8e86-00144feabdc0.html#axzz17d9Ql7lv

the Hurun Rich List was a female entrepreneur named Zhang Yin, the first time a woman has been in the number one slot.

Based on the Hurun Rich List, only 11% of the richest people in China are female, and the average wealth of the top 50 richest women in China is only one third of the average wealth of the top 50 richest men. Besides, when looking into Chinese entrepreneurs as a whole, only 20% of the enterprises are led by females (the global average ratio is 45%-50%). The most successfull sectors for female entrepreneurs are capital-intensive sectors, such as real estate, investment, and finance. Given the demographic distribution of females to males in China 1.16:1, which is much higher than the world average ratio of 1.07:1 (China Statistics Yearbook 2008), we have to ask the question: "why is the portion of female entrepreneurs so small compared to the world average ratio?"

One possible reason may be that the level of education of females is comparatively lower than the level of education of males. According to Chinese national statistics, the ratios of illiterate females (10.96%) and women with only primary school education (32.99%) are much higher than their male counterparts (the illiteracy rate is 4.11% for males, with a primary school education rate of 24.38% for men). This educational imbalance between genders may be a problem of entrepreneurs, because education plays an important role in their ability to mobilize resources and implement innovation. Female entrepreneurs with lower education may be more adversely affected.

The second possible reason for fewer female entrepreneurs might be the gender role conflict (Shelton 2006; Welter 2004). Due to the mainstream gender bias, females are usually stereotyped as housewives after marriage, which may cause work-family conflicts for their career, especially in regard to entrepreneurial behavior. Such role conflicts may limit females' chances of obtaining resources and conducting innovation, which is of high importance for entrepreneurial success.

The third possible reason for women not wanting to be entrepreneurs may be due to the risk-averse traits rooted in Chinese women. Due to the Confucions ideology

and patriarchal nature within families, females are expected to be subordinate to men; fathers, husbands and even sons. The women had to have "bounded feet" and were often not allowed to be educated. Girls were persuaded to be in charge of household chores, far from the outside world, and stability was encouraged while out-of-the-box thinking was discouraged (Beavor et al, 1995). The suppression for female talents may be an obstacle for them to engage in economic activities and this excludes them from becoming entrepreneurs.

Another possible reason might be due to the political ties. With the deepening of reform and the maturing of the market economy, even though the pay-off from political ties is declining, it is still significant (Nee 1989). Such political ties impose some entry barriers for business. Ordinary females without strong political ties rationally choose not to do business, and are more prone to failures. Those females with political ties possess the capability to do business often in the most profitable and wealthiest sectors of industry. According to Hurun's rich list, most rich people are located in the power center of Beijing, and are in the real estate sector, which has been regarded as the most convenient way for the government to get revenue by collecting rent owned by the government as local fiscal revenue (Xinhua News, Dec 27, 2010).

Overall, the lower educational levels, gender role conflicts, decreased risk-taking propensities and having less political ties, may result in most female entrepreneurs being at a disadvantaged position. Only those female entrepreneurs who overcome all these barriers can achieve significant business success in China's economic transition. For ordinary female entrepreneurs, the factors influencing performance may be different from the factors influencing male entrepreneurs. Therefore, it is important to conduct the study and compare entrepreneurs' performance in China.

## 1.2 Research question

Given the possible disadvantages mentioned above, it is important to draw empirically based comparisons and to test whether the gender differences affect entrepreneurs' performance. Also of importance is whether female entrepreneurs are

influenced by the same factors as male entrepreneurs. We must consider entrepreneur performance determinants for both genders. The private sector contributes the majority of employment opportunities as well as tax revenues for China, but the dominant gender within the private sector is still male. Given that private business entities are very important for the country, more participation should contribute to an improved economic performance. The potential limitations for female entrepreneurs should also be explored.

According to OECD economists, the private economy accounted for 52.3% of industrial value-added wealth in 2003, compared with 27.9 percent in 1998. The sum of the indigenous and foreign private-sector companies in China's industrial profits was 71.2 percent in 2005 (Huang 2008). According to figures from the All-China Federation of Industry and Commerce (ACFIC), in 2009, China's private sector created 11.4 million new jobs, contributing to more than 90 percent of all urban new employments. The number of registered private companies nationwide reached 7.9 million until September 2009, with the combined registered capital of these companies reaching 1.36 billion yuan ($200 million)[2].

Due to private companies' tremendous contribution to the national economy, there are a lot of studies on entrepreneurs (McMillan and Christopher 2001; Li et al 2004), but there are seldom any studies on Chinese female entrepreneurs. Only 20%-25% of private companies are led by females, a ratio that is significantly lower than female entrepreneur participation in developed economies; for example, the figure is 36% in Canada and 38% in the United States (Rossman 1991).

As mentioned above, entrepreneurship and private business is so important in the transition of China, but gender differences are not the same in different countries (Shane et al, 1991). Therefore, there is the need to understand the gender-specific issues on entrepreneurship in China.

[2] http://www.chinadaily.com.cn/bizchina/2010-01/30/content_9402597.htm)

The first research objective is to investigate whether there are significant differences which set Chinese female entrepreneurs apart from their male counterparts. The study utilizes the factors of risk, innovation, resources and management styles. Those differences are derived from the characteristics of the entrepreneur.

The second research objective is to explore whether the differences in those characteristics affect the performance of the entrepreneurs to the same extent. If gender characteristics are positively related with performance, such characteristics should be promoted; otherwise, they should be eliminated.

## 1.3 Method

The author utilizes empirical analysis to make the comparison solidly based and explore the differences between risk taking, innovation, resources, and management styles. The study uses cross-sectional data and empirical analyze. The sample of the study consists of 3847 company level observations from all industries in the year 2005 (the survey was conducted in 2006, but the questions are asked on the operations in 2005). When examining the differences between genders, the mean values for each gender group are compared. Since performance is a continuous dependent variable, an ordinary least square estimation (OLS) is used to explore the determinants of performance. In order to have a more robust estimation, correlations between variables are checked so as to avoid multicollinearity problems.

## 1.4 Limitations

The available data for Chinese female entrepreneurs study is limited. First, the data consists of 3847 observations. Only 14% of the samples are female entrepreneurs, so essentially, the ratio is lower than the national average. Thus there might be some selection bias when conducting surveys. As the survey was carried out by state administrative agencies, over-sampling for bigger companies occurred, as small companies are usually ignored and neglected by the state, for instance, survey

conductors may not be interested in going to a female-owned grocery store or to female-owned laundry shops to gain data, because they are too small to be considered.

Secondly, the data set consists of national survey data only in the year 2006. Many changes have occurred in China after the survey, affecting private enterprises in a negative way. During the financial crisis, in order to boost and stimulate the economy, the Chinese government implemented a 4 trillion RMB stimulus package (about 570 billion U.S. dollars). The stimulus package favors the infrastructure construction sector, the real estate sector and the transportation sector, which are dominated by state-owned-enterprises. Thus, the expansion of private enterprises is much slower, and the environment for entrepreneurs has worsened. In Zhejiang Province, entrepreneurs flourish most in China. In the year 2008 due to the world economic crisis, about 22 000 private firms were closed, and the number of new registered private companies was reduced by 10% compared to the number in 2007[3].In terms of mergers and acquisitions in 2009 executed by the top 500 Chinese enterprises, approximately 91% were undertaken by state owned enterprises, and only 9% of such mergers were performed by private enterprises (Xinhua News Agency).[4]

Thirdly, drastic changes have taken place after the survey, especially for female entrepreneurs. First, female entrepreneurs' associations at provincial level have been formed. Such social networks may lead to changes in performance. Second, the economic downturn and financial crisis created both challenges and opportunities for entrepreneurs, and female entrepreneurs may have behaved differently under such risks. Industries typically employing many females did not benefit from the stimulus package as much as those employing many males. With worldwide advances in communication, female entrepreneurs may finally be able to avoid information asymmetry making it easier to compete with the men, thus improving their performance.

[3] http://finance.ifeng.com/news/opinion/jjsp/20090212/365412.shtml
[4] http://news.xinhuanet.com/fortune/2010-09/07/c_12525227_2.htm

## 1.5 Outline

The remainder of the thesis is organized into three sections. Section 2 provides a theoretical framework reviewing basic concepts of the entrepreneur; examining existing theories about female entrepreneurs and discussing the anticipated determinants on their performance. Section 3 offers empirical methods, containing both statistical analyses for data sets and also empirical regression and discussion of several hypothesizes. Two separate regression models based on datasets are used to test the same group of determinants for entrepreneurs' performances. The extent of influence on each determinant is compared. The last section presents some conclusion, implications and suggestions for further research.

## 2. Theoretical Framework

According to Hagedoorn (1996), Schumpeter's main points of view in his book *Capitalism, Socialism and Democracy* is that entrepreneurship and innovation are interrelated: "entrepreneurs were the agents of innovation, the pivots on which everything turns". He sees Schumpeter's entrepreneur as individuals "never satisfied by results based on existing innovations but keeps searching for new opportunities". He argues Schumpeter's points as that entrepreneurial innovation is the disequilibrating force that pushes economic development to new equilibriums.

Schumpeter did not invent the word entrepreneur. The origin of the English word 'entrepreneur' comes from the French word "entreprendre", which can be translated to "to do something, or to undertake". Richard Cantill, in his book first published in 1755 L ' Essai sur la nature du commerce en general, ascribed to the definition by adding a risk component to the word. He deems the bearing of risk, engaging in business without an assured profit, as the distinguishing feature of an entrepreneur. He uses this word to describe generals in armies who explore the world trying to seek wealth in 15th Century Europe (Hebert and Link, 1989).

Later, French economist Jean-Baptiste Say made the word 'entrepreneur' popular. He defined it as a person who shifts resources from an area of low productivity to

high productivity. Say's definition emphasized the resource integration process in conducting business. In 1848, economist John Stuart Mill used the term in his book. In Mill's view, entrepreneurs are those who take risks while managing a business.

Based on Schumpeter's research, Kirzner in 1973 stresses the alertness of entrepreneurs. He derived the concept based on "creativity", which was utilized by Schumpeter. Kirzner stressed the personal traits of "alertness". According to him, the difference between "alertness" and "creativity" was the former requires less action or movement than the latter demands. Therefore, the author places characteristics of entrepreneurship into four categories, based on the definitions of different theoretists: risk taking from Cantill's definition, innovation from Schumpeter's definition, resources from Say's definition, and management from Mill's definition.

## 2.1 Risk taking

According to the above economists' definition, the core spirit of entrepreneurship is "to do" and "to execute". Both Cantillon and Mill stress the risk taking characteristics of entrepreneurs. In studies and experiments by Sexton (1990), there is no gender difference among the entrepreneurial risk-taking traits. Brockhaus (1980) argue that entrepreneurs are moderate risk takers. They are not too adventurous or too conservative. They are rational economic actors, calculating on cost and benefits and making decisions for the enterprises. Carland and Carland (1991) claims that both male and female entrepreneurs show stronger personality traits than non-entrepreneurs, but the traditional traits apply equally to females. Accordingly to Carland and Carland (1991) there is no gender difference in risk taking.

Various psychological studies and experiments do show that female entrepreneurs are less willing than male entrepreneurs to become involved in situations with uncertain outcomes (Sexton and Bowman-Upton 1990). This indicates that women are more risk-averse than men. If female entrepreneurs have the broad psychological propensity to refuse risks, such risk preference can affect the entrepreneur's performance in two ways. On the one hand, female entrepreneurs are less willing to

expand their business; they control the size of the firm so as to remain autonomous and be safe, thus they lose some potential profit and this retards performance (Cliff 1998). On the other hand, female entrepreneurs are more conservative. They only do business when they are sure to win an expected profit. Literature on whether there are differences in risk-taking traits among entrepreneurs is by no means conclusive.

When discussing entrepreneurs' risk taking propensity in a Chinese scenario, it is hard to say whether Chinese female entrepreneurs are comparable to their male counterparts in terms of risk taking. There is no reliable official data on private business before 1980, and no mention of Chinese female entrepreneurs. Before 1978, China was a strictly planned economy, and private enterprises had no legitimacy. From 1978 onwards, there were dual-track of price system and economic transition. Individual businesses were initiated by starved peasants who sought to make a living. To get rid of political risk and to receive private business legitimacy, most entrepreneuers offered company shares to local governments or cadres for free, and registered the company as township village enterprises (TVEs) (Naughton 2007).

In the late 1980s and early 1990s, the market economy was much more mature in Southern China. Therefore, many intellectures and governmental cadres felt bored with stable permanant jobs. They sought new opportunities in starting their own businesses (Liu 2001). They started in industries with low entry barriers, such as retailing, garment production, construction, labor subcontracting, and long distance transportation. As China became more open, foriegn invested enterprises also emerged. Some TVEs became joint ventures with foreign invested enterprises so as to gain access to high technology and to manufacture consumer products.

After the reforms in business and public life of the 1980s, Chinese female entrepreneurs started to prepare themselves for business life through participation in workstudy and social practice. According to a suvey by *Invest Scientifically,* figures show that roughly 10 percent of all existing women-led business had registered a business enterprise before 1980, 17 percent registered in the 1980s with the remaining

73 percent after 1990. [5] The pace of Chinese female entrepreneurship development is much in line with private entrepreneurship developments, although at a lower pace. There might be some gender differences in risk-taking. When Seet (2008) uses Singaporean entrepreneurship data, he finds that risk taking characteristics are not significantly different between genders.

**Hypothesis 1: There is no difference in Chinese female entrepreneurs' risk characteristics compared to their male counterparts.**

## 2.2. Resources

Resources refer to all the factors that might influence the value creation of a company, such as initial capital, social capital and human capital. The integration of resources is a dynamic process including various levels. First, it requires the interface of access to key resources and the availability of resources. Secondly, it requires the knowledge to translate accessible resources into the entrepreneuer's profits. Making use of resources is an important factor affecting performance and one of the key feature of entrepreneurial behavior is to pursue opportunities regardless of the resources under control (Stevenson, 1983; Jarillo, 1989).

Resources are of great importance for all entrepreneurs, especially Chinese entrepreneurs, because the institutions in China used to be part of a planned economy, and all sectors were controlled by the government with all resources being allocated according to administrative demand. After over 30 years of reform, many features in the planned economy have not completely faded. The benefits exerted from a re-distribution system decreased but were still pervasive. The benefits derived from efficient production have increased significantly (Nee 1992). In many sectors, it was still highly controlled. If an entrepreneur wanted to participate in such a value chain in the controlled industry or sector, he or she had to have the capability to mobilize resources (Naughton 2007).

The aquisition of resources is important as it can manifest itself and bring about new and heterogenous resources. Conner (1991) deems that resources -based

[5] http://www.china.org.cn/english/2002/Oct/45066.htm

entrepreneurship requires investment in capabilities and resources that can be tangible and intangible assets. Based on this opinion, the author includes three categories: economic capital, human capital and social capital according to Firklin (2001).

### 2.2.1. Economic capital

Economic capital is the most obvious type of resources. One typical source of economic capital for entrepreneurs is venture capital. Kortum and Lerner (1998) find that increases in venture capital activity in an industry are associated with significantly higher patenting rates, and venture capital may have accounted for 8% of industrial innovations for the period they studied.

Economic capital as one of the main resource types can also affect the acquisition of other forms of resources. A company with good financial capital can afford talented staff and gain superior human resources, which in turn affects company performance. It can also enable an entrepreneur to obtain better businesss connections.

Economic capital is one of the most obvious and visible resources; as it can create a buffer against systematic downturn and random shocks. It also allows the pursuit of more capital-intensive strategies, such as merger, aquisition and faster business expansions, which not only exludes competitors but also induces faster growth and better performance (Cooper et al, 1994).

Some scholars argue that female entrepreneurs are disadvantaged in obtaining economic capital. First, venture capital is less likely to be offered to female entrepreneuers, as venture capitalists regard gender roles as a potential obstacle for company performance. They argue that pregnancy and child-rearing may distract female entrepreneurs from focusing on business(Shelton, 2006). Secondly, women's average wages are lower than their male counterpart's. It is more difficult for women to accumulate capital for starting up companies. According to the Chinese labor economists Cai et al (2005), based on national statistical data, it was found that gender segregation existed in the Chinese labor market. Although the employment rate for women is slightly higher, there are significantly less women in occupations that are

highly paid, suggesting that women are endowed with less economic capital if they accumulate initial capital through their previous wages. Cai et al (2005) also found that women are discriminated in the job market in terns of both wages and job entry level. Chen and Duan (2009) used the quantile analysis method and found that in the period 1996 -2005, even though wages for both genders increased, men's wages rose much faster and women were more likely to be located in the low -wage end of the distribution. When looking into the reasons why women have lower salaries than men within the same industry, 6.65% of the differences were caused by a contrast in skills, and the rest can only be explained by other forces, such as discrimination. In the period of 1996 -2005, even though, China had been marching towards a more mature market economy, women did not enjoy the benefits of growth to the same extent as men. It was harder for female entrepreneurs to gain venture capitalist funding and to get initial capital from savings.

Other scholars claim that female entrepreneurs may experience no differences in economic capital compared to men. Orser et al (2006) examined gender differences among Canadian entrepreneurs seeking external financing after controlling for size and industry sector. They found that female entrepreneurs were likely to seek all types of external financing, except for external equity capital. When asked the reasons for not seeking financing, the majority of respondents, male and female, specified that financing was not needed. Thus, there was no gender difference among Canadian entrepreneurs in applying for finance or obtaining economic capital.

As of today, there is no previous research on Chinese female entrepreneur and their economic capital acquisition compared to their male counterparts.

**Hypothesis 2: there is no difference in economic capital acquisition between Chinese female entrepreneurs and their male counterparts.**

### 2.2.2. Human capital

The second type of resources is human capital, which endows entrepreneurs with knowledge and enhances their cognitive abilities, leading to more productive and more efficient potential activity (Schultz, 1959; Becker, 1964) . Thus human capital

can be a factor affecting the innovation ability and company performance. Human capital resources not only refer to the entrepreneur's own talent, but also refers to the employees' human capital. Experienced and well-trained workers can make a company more innovative, become more efficient and therefore perform better.

General human capital, represented here by the entrepreneur's education and race, may reflect the extent to which the entrepreneur can develop relevant skills and contacts. According to the fifth National population census in China (China National Statistic Yearbook 2009), women have almost as much human capital as men and there is not much educational difference between genders. According to such statistics (2009), the ratios of illiterate females (10.96%) and those with only primary school education (32.99%) are higher than their male counterparts(4.11%, 24.38%).

However, female-owned businesses are usually newer and smaller, suggesting that personnel at female entrepreneurial companies have less experience (Cliff 1998); Female bosses have a smaller pool of talent for choosing the right candidate for key positions.

In general, there may not be any differences in human capital among entrepreneurs differentiated by gender. Even though women may suffer from less formal education, they can persue other business related courses to enhance their human capital.

The national educational level for females is slightly lower, thus there may not be so many human capital differences between genders. The average number of years of education for women is only 0.87 year less that that of men. And the learning by doing process can be realized by various educational methods. Thus female entrepreneurs may not lack of human capital in comparison to their male counterparts.

**Hypothesis 3: there is no difference in human capital between Chinese female entrepreneurs and their male counterparts.**

### 2.2.3. Social capital

The third kind of resources refers to social capital: the ability for actors to derive and extract benefits from their social structures, networks and memberships (Lin et al.,

1981 and Portes, 1998). Social networks are provided by the extended family, community, or organizations. They are relationships to supplement existing capital and to enhance the effects of human and financial capital (Bourdieu, 1986; Coleman, 1988; Loury, 1987). Social networks are important for knowledge cluster and innovation. The author stresses that social capital functions through smoothing operations and transactions, such as getting approvals in licenses, building distribution channels and getting more information about bidding.

Burt (2001) discussed social capital with structural holes. He argues that an association is a close-knit club with members sharing information. But not all individuals can have direct contact with those in another association. Meanwhile, an entreprneuer may participate in various associations, thus bridge through individuals within different orgnization. An entreprenuer at such structural holes have more chances to make use of heterogeneous information and smooth transactions so as to win extra business profits. Economic agents are linked and affected by each other. An enterprise with better social capital is regarded to have some competitive advantage, as the trust derived from social capital will lead to reduced transaction costs and more repeated transactions, resulting in firm over-performance (Wu 2008).

In democratic nations and mature markets, society operates in horizontal and flat directions. In the transition economy of China, the social structure is not so horizontal but is "vertical democracy", a mixed balance between bottom-up and top-down (Naisbitt and Naibitt, 2009). After opening up with the expansion of markets and the deepening of reforms, horizontal market transactions increase in significance while dependence on vertical ties lessens. The features of a planned economy and vertical command economy do not fade completely, while market order flourishes (Nee 1992).

Social capital has two dimensions in China, the ordinary membership in market organizations (same as that in mature economies) and relationship with administrative orgnizations (the political connections). There are special features for a transition and planned economy. Horizontal social capital includes both strong ties (such as, kinship, family origin, spous, classmates, colleagues) and also weak ties such as aquantances

in social clubs. These are not only related to access to resources, but also to innovation, and horizontal social networks, which are further related to innovation theory (which will be discussed later).

Within this thesis, vertical social capital is discussed first. It is associated with political connections. As pointed out by Bian and Soon (1997), economic agents can use connections to gain influence from powerful people, and reduce the extent of information assymetry. Such behavior can reduce risks and lead to better performance. Bian and Qiu (2000) also prove that an entrepreneur's work experience in government accumulates social capital and cultivates their political connections, which also directly leads to better operating and economic profits. Shi, Hu and Fu (2007) use data from listed companies and find that political connections enhance sales revenue. Luo and Liu (2008) employ 887 observations from 2004~2006 on listed Chinese private companies. Their empirical analysis proves that political connections and political capital enhance a firm's possibility to gain entry into government-regulated industries. Hellman, Jones and Kauffman (2000) find that firms with stronger political connections are able to affect political decisions, state capture and achieve higher growth rates. Nee and Opper (2006) use World Bank data and find that politically active CEOs do have easier access to credit.

Faccio (2006) uses public data from 42 countries and finds that political connections have a significant positive effect on resource access, as it makes it easier for debt financing, tax benefits, market power and supply contracts from the government. However, Faccio finds political connections have negative effects on firm performance.

When private enterprises want to be listed and get financial help, they have to go through a lot of paper work and approvals through state-controlled organizations. (Naughton 2007). There are always a lot of "national strategy" sectors with high entry barriers, thus private companies have to win government favors and approval if they want to diversify or move into such sectors. Previously, the auto industry was highly regulated, and currently, the telecommunication industry has entry barriers too. There is a popular video shown on Chinese websites of the chief official of Zhejiang

Business Administrative Bureau Zheng Yumin, being interviewed by a CCTV moderator[6]. The story mentions that when central government cadres went to visit Suntech Power and to promote its growth and support in finance projects, the boss of Suntech Power requested nothing but the privilege to read the government documents so as to gain clearer direction. That indicates that even if political connections in China bring no direct profits at all, it keeps an enterprise better informed on policies, regulation and promotions, which can avoid wasted investment in regulated projects.

There is no previous literature concluding whether female Chinese entrepreneurs have the same amount of social capital as their male counterparts. Peters and Stringham (2006) found that social drinking builds social capital by building relationships, and adding contacts to their BlackBerries that result in bigger paychecks. In China, social norms strictly state that women should not drink alcohol or smoke, which are typically male behaviors. Thus women may be at a disadvantage compared to men. Scarce resources such as land, high technology, and renewable energy are still dominated by SOEs, and controlled by party cadres. There were few women cadres. However, due to the one-child policy and birth control, a girl can be the only child in the family, especially in the cities. Females have equal access to family social capital. Thus it is hard to judge whether there are gender differences in vertical social capital.

***Hypothesis 4: There is no difference in vertical social capital between Chinese female entrepreneur and their counterparts.***

## 2.3 Innovation

Joseph Schumpeter derived a theory of innovation based on his study of entrepreneurship. He proposed that "…the function of entrepreneurs is to reform or revolutionize the pattern of production by exploiting an invention or, more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way, by opening up a new source of supply of materials or a new outlet for products, by reorganizing an industry and so on…" (Schumpeter, 1943)

[6] It's on two of the most famous video sharing websites: http://v.youku.com/v_show/id_XMjI3MjI0NTEy.html and http://www.tudou.com/programs/view/NEXk8TTd7go/

According to Hagedoorn (1996), Schumpter's main idea is that "entrepreneur is the personification of innovation, the individual who carries out new combinations", that entrepreneurship and innovation are interrelated. In his conclusion, Schumpeter stressed the "innovator and debtor" are the role of entrepreneurs, but Schumpeter did not stress the risk-taking characteristic or resources integrating characteristic.

Schumpeter didn't compare gender differences in innovation among entrepreneurs, but Hisrich and Brush (1984) did. Their survey shows that none of the 468 businesses of female entrepreneurs in 18 states of America was based on a product innovation. The majority founded their businesses using an established or slightly modified product for an existing market. In other words, female entrepreneurs lack innovation ability in developed economies.

What about female innovation ability in transition economies? According to Knack and Keefer (1997), in low-trust economies, entrepreneurs have to spend a lot of time monitoring partners and workers, which reduces the time available for innovation. On one hand, Chinese female entrepreneurs also face gender-role conflicts resulting in less time for innovation. On the other hand, due to relatively cheap labor and strong family ties, it is easier for Chinese female entrepreneurs to hire nannies to take care of children, or have their mothers or mothers-in-law take care of the family. Through those means, female entrepreneurs in China are less likely to be distracted from innovation.

Since it's not obvious to judge whether Chinese female entrepreneurs are as innovative as Chinese male entrepreneurs, the following will unfold the picture by analysing the preparation for innovation and innovation results.

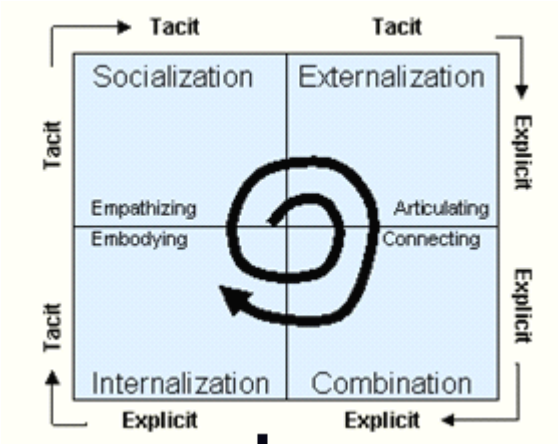
### 2.3.1 Innovation input

Innovation is a core ability of the entrepreneur and is determined by the renewal and commercialization of knowedge. Polanyi (1958) categorizes knowledge into two categories: explicit knowledge and tacit knowledge. In order to explain new knowledge-generation and innovation, the concept is derived into three categories,

explicit knowledge, tacit knowledge and knowledge cluster. As knowledge is not static and can be transfered through a SECI process (Figure 1), adding a dimension of knowledge cluster is useful as it describes the dynamic feature of entrepreneurial innovation.

The SECI process refers to the process of socialization, externalization, combination and internalization process between tacit knowledge and explicit knowledge, a model established by Nanoka and Takeuchi. Figure 1 (see below) shows the dynamic process between the two kinds of knowledge. It suggests that when transferring knowledge from one quad to another, new knowledge and innovation is most likely to take place. It also indicates the importance of knowledge sharing and updating in knowledge clusters.

Figure 1: The SECI model and process




(Source: Nonaka and Takeuch "The Knowledge-Creating Company", 1995, Oxford University Press)

In fact, when Nanaka mentions combination and socialization, it is in line with the innovation connotation: combination and commercialization. Before probing into analysing whether female entrepreneurs are as innovative as their male counterparts, we need to discuss the three categories of knowledge. As discussed above, knowledge is the most important ingredient in bringing about innovation. Three kinds of knowledge are discussed: explicit knowledge, tacit knowledge and knowledge cluster.

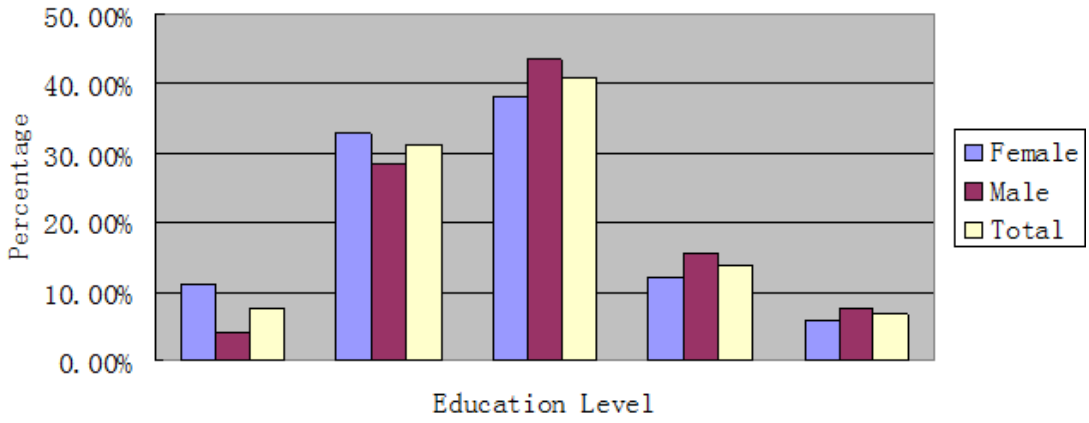
### 2.3.1.1 Explicit knowledge

Education "assists in the accumulation of knowledge", as well as "integrating and adapting to new situations" (Weick, 1996). Explicit knowledge is technical and "requires a level of academic knowledge or understanding that is gained through formal education, or structured study" (Smith 2001). "Education determines the initial knowledge stock and innovation is the renewal of knowledge" (Nelson and Rosenberg 1993) Therefore, basic education and explicit knowledge are cornerstones for preparing the entrepreneur for innovation.

Cohen and Levinthal (1990) argue that "absorptive capacity determines an individual's ability to recognize the value of new information, to absorb new information and put it into commercial use". As "the design and processing for new knowledge is based on the existing knowledge", a subject with less explicit knowledge is accompanied by less absorptive capacity and less innovation ability.

Figure 2 (see below) shows that females and males do not have the equal educational opportunities in China. The female illiteracy rate is over two times that of the males , and the percentage of women with college education is much lower than their male counterparts. The education difference is obvious but the gap is not so big, as can be seen in Figure 2.

Figure 2: National educational level comparison between genders




Data source: 2008 Population Census, National Statistics Bureau.

Lack of education could be a major cause for the fact that the ratio of female entrepreneurs is lower in China than in developed economies. For those who have already established enterprises, it is not certain whether they have less explicit knowledge. Further analysis on the explicit knowledge comparison needs to be done later in the data analysis of China.

#### 2.3.1.2.Tacit knowledge

Innovation is turning newly-generated knowledge into profits through entrepreneurial endeavors. As pointed out by Polanyi (1958), another dimension of knowledge is tacit knowledge. He addresses the function of tacit knowledge for innovation. Valuable expertise can often be body-based tacit knowledge. For instance, painting and playing the piano are body-based activity. Therefore, a painter or pianist may not be able to articulate the feeling of such an activity. Gender stereotype is a form of cognition based tacit knowledge, rooted from one's belief system. Gender role is a social-culture based on tacit knowledge, while female' roles may be different from that in other Asian countries. All the three kinds of tacit knowledge; body-based, cognition-based, and social-culture based; are hard to articulate or accumulate.

Polanyi (1958) points out, "We know more than what we tell". He claims that a lot of human skill cannot be articulated and can only be known to the person who has that skill. "We know a person's face, and can recognize it among a thousand, indeed among a million. Yet we usually canot tell how we recognize a face we know. So most of this knowledge cannot be put into words." When arguing for that kind of body-based tacit knowledge, Rosenberg (1982) uses traditional technical skill as an example to illustrate that the traditional skills and technical know-how can only be obtained through continuous learning-by-doing and trial-errors. This body-based tacit knowledge is subjective and internalised. In the Chinese context for body-based tacit knowledge, women may be in either a better or worse position. A lot of body-based activities like silver-crafting, Kung Fu, folk acrobatics and paper-cutting, cannot be taught to females but only to males. Women are regarded as being better at

body-based activities like weaving and knitting, which do not require muscles but requires hand flexibility.

The second kind of tacit knowledge, cognitive tacit knowlge, describes knowledge as ingrained schema, beliefs and mental models that are taken for granted. Such knowledge is difficult to change. Zander and Kogut (1995) describe it as the " inertness of knowledge", and Von Hippel (1994) describes it as "sticky information", Due to the "sticky" character, only those who are fully informed are best prepared for innovation. China, a country with thousands of years of Confucious ideology, hierarchy is popular. The flow of tacit knowledge favors men much more than women as women are regarded as subordinate characters. From this aspect of tacit knowledge, women may be disadvantaged.

The third kind of tacit knowledge is based on social-culture. Nowadays in China, the social -culture for women is quite complicated. Women are encouraged to be modern and independent, with their own careers, as Mao proposed "Women can also hold up half the sky encouraging women to go out and participate in society". On the other hand, due to long term feudalist ideology and path dependence, peoples still consider women's deed as being based on "three bonds and five constants", a value system from Confucius, claiming women should obey their fathers, husbands and sons and should be benevolent and have propriety, wisdom and fidelity. Such hierarchies in social -culture places women at a subordinate level in society and hinder female entrepreneurs' innovation abilities.

### 2.3. 1.3 Knowledge network and cluster

The proposition that creativity and fresh ideas spring from the interaction of different knowledge agents has been accepted both in knowledge literature (Simon 1986), and in related fields such as social networks (Granovetter 1973). Bathelt (2004) argue that knowledge can be attained by investing in building channels of communication called pipelines. There is always a lot of buzz indicating both useful information and useless information in the attained knowledge，but the co-existence of

high levels of buzz and many pipelines provide firms located in lively clusters with a string of particular advantages not available to outsiders.

According to Granovetter (1973), scattered explicit and tacit knowledge converge gradually to a pool of knowledge through a variety of knowledge network association, and such knowledge association functions well in knowledge diffusion and innovation. And weak ties serve as better clusters since the members within the group have heterogenous knowledge. To be specific, weak ties are those with distant and infrequent interaction, hence a loose-knit but broader knowledge cluster; while strong ties act as a close-knit network. Business associations are usually weak ties, while relatives and family members are regarded as strong ties.

When contextualizing knowledge cluster and innovation with Chinese entrepreneurs, knowledge pipelines are usually a kind of horizontal social network structure,in the form of banquet and business associations. Due to gender roles, women cannot be as sociable as men, especially in regards to drinking alcohol and foot massage, where business deals are reached more easily when business people are more relaxed. In China, the current news in the industry is exchanged at such informal settings. Even though noise and wasted information exchange may occur, there is also some useful information leading to innovation. Female entrepreneurs are more likely to be excluded from such banquet clusters. Business associations are headed by bureaucratic cadres, whereby there are few women in such positions. Women are less likely to get involved in the interaction and innovative knowledge through such clusters.

Another phenomenon is that there are more women's entrepreneur associations at several administrative levels. There might be as many, if not more, knowledge clusters for women.

Therefore, it is not conclusive whether Chinese female entrepreneurs have less knowledge than their male counterparts on the three aspects of inputs: explicit knowledge, tacit knowledge and knowledge clusters. More importantly, these three innovation inputs are too difficult to capture or measure.

### 2.3.2 Innovation measurement

As discussed earlier, the three knowledge aspects are the preparation for innovation. Even though they are important, they cannot easily or directly measure the innovation capability.

Acs at el (2002) argue that the procedure of innovation, R&D and human resources are the inputs. New knowledge is the intermediate output, with revenue and profit increasing as the final output of innovation.

In economics, R&D and patents are generally utilized as the determinants for innovation (Cuddington 2001). Human recourses for innovation refers to R&D manpower and spending, the headcount of scientists and engineers within an organization. Cooper et al (2002) did some empirical research and found that the number of patents contributes to growth.

Even though innovation is deemed to be an important factor affecting enterprise performance in growth, there is no empirical literature comparing the gender difference in innovation.

**Hypothesis 5: There is no difference in innovation features between Chinese female entrepreneurs and their male counterparts.**

## 2.4. Management Style

Besides the mentioned factors, such as risk-taking, resources and innovation, management style is another factor that might influence firm performance.

Female enterpreneuers might have different management styles from their male counterparts, contributing to a difference in performance. Chodoraw (1978) found that girls and women tend to develop a sense of connection on their original relationship with their mothers while boys seperate from their mothers and want to be anonymous. Due to gender differences, when entrepreneurs build orgnizations, their values and cultures can affect the development of their companies. Farr-Wharton and Brunetto (2009) confirm previous research and argue that female entrepreneurs traditionally use a relational approach to managing their businesses, and about a quarter of the

female entrepreneurs use a social capital approach to learn about potential venture opportunities from their staff.

Tsui at el (1997) find that organizations with long-term relationship tend to have higher levels of performance. Some scholars deem that the long-term management style and family business makes firms out-perform other firms. Maury (2006) finds in Finland, active family-controlled businesses continue to outperform nonfamily-controlled businesses in terms of profitability in different legal regimes. McConaugby at el (2002) control for size, industry, and managerial ownership and the results suggest that firms controlled by the founding family have greater value. They are operated more efficiently, and carry less debt than other firms.

However, another view is that family ownership makes firms under-perform their peers. Martínez et al (2007) draw a sample with 175 firms in Chile. The group of 100 family-controlled firms performed significantly better than the group of 75 nonfamily companies over the 10-year period (1995–2004). They find that public family firms perform better than public nonfamily firms.

If there is really some long-term relationship of management style differentiated by gender, this may lead to a difference in enterprise performance. Therefore, long-term relationship management style is applied as a framework for probing into an entrepreneur's performance. If there is really a difference in gender management, it might be an important indicator to explain performance difference. The following hypothesis needs further testing:

**Hypothesis 6: There is no difference on management features between Chinese female entrepreneurs and their male counterparts.**

## 3. Methods

### 3.1. Data

Given the lack of systematic data on private business owners in China, there is not much understanding regarding the comparison of private business owners. Neither is there much empirical research on Chinese female entrepreneurs.

Earlier research on business activity in China usually relied on published government statistical yearbooks to gain insights into this type of business environment.

One exception is a large-scale national survey of private business owners that was firstly conducted in 1991. At that time, it was carried out by the State Economic System Reform Committee and State Industry and Commerce Administration. Later, such a cross-sectional study was repeated in 1995, 1997, 2000, 2002, 2006 and 2010 (The 2010 data were not available to the author at the time of writing this thesis）. The sample size for each survey is as follows: 1440 (1993), 2869 (1995), 1947 (1997), 3073 (2000), 3258 (2002), 3670（2004），3837（2006）.

The interviewees are all domestic businesses that were officially registered as "private enterprise" at the time of the survey.The survey sampled thousands of enterprises all over China. The firms were sampled randomly based on a stratified sampling method for all administrative layers in China, including cities, towns, villages, and industries. All owners had at least one year's operation at the time of the survey. It was the first survey of private business owners on a national scale. This data set has been made available to researchers at the Chinese University of Hong Kong. With the assistance of the University Service Centre of the Chinese University of Hong Kong, the original data set was electronically coded.

The survey consisted of two parts. The first part of the questionnaire was completed by the private business owner. The second part by the government officials in charge of business registration. The data was also logically checked to ensure internal consistency by cross-validating the owners' responses with those of the government officials. For example, the sales turnover figures were compared between the two respondents concerned and no significant differences were found.

The survey in 2006 which this thesis uses was also organized and managed by a team of researchers affiliated to organizations such as: the Department of National Front (*Guo Jia Tong Zhan Bu*), All-China Federation of Industry and Commerce (*Quan Guo Gong Shang Lian*), State Administration for Industry and Commerce (*Guo*

*Jia Gong Shang Zong Ju*) and The Research Institute for Chinese Private Business (*Zhong Guo Min Ying Qi Ye Yan Jiu Xie Hui*).

The questions were aimed at business operations at the end of year 2005. At which point, there were 4.3 million private entreprises in China, and the sample ratio for the survey was 0.55‰[7]. The survey covered 19 sectors and all 31 federal municipals. As mentioned in the previous paragraph, it is a continuation of previous surveys conducted in 1997, 2000, 2002 and 2004. Some questions covered the previous operations of the company, and those private enterprises which were registered in 2005 were not taken into account. The questionaires were distributed according to private business region distribution. Many Chinese private companies are located in the following five regions: Jiangsu, Zhejiang, Guangdong, Shanghai and Beijing. More obervations were allocated to the mentioned five areas accordingly so as to make data more representative and trustworthy. Sectors and urual-urban dividance were also considered when surveying.

In the 3837 observations of private business surveyed in the year 2006, 14% of companies were led by females, while 86% were led by males. Compared to the gender demographic structure in the same survey in 2004,[8] there was almost no change. Such numbers indicate that the contemporary Chinese private sector has been dominated by males and there were no big changes from 2004 to 2005. The ratio of Chinese female entrepreneurs was much lower than national reported data by women's associations, which claimed to be 20%.

Compared to OECD female entrepreneur participation, there were fewer Chinese women entrepreneurs. According to OECD labor force statistics (the average for 1996-1997), the female entrepreneur ratio in member countries is about 28.5%. To be more specific, 41% of entrepreneuers in Canada were women, 39% in America, 35% in Austria, 32% in Japan, 31% in New Zealand, 35% in Portugal, 29% in Belgium. [9] This comparison suggested that there were proportionally fewer Chinese female entrepreneurs than that found in developed OECD countries.

[7] http://anhui.mofcom.gov.cn/aarticle/sjdixiansw/200702/20070204390611.html
[8] http://www.southcn.com/finance/gdmqgc/gdmqyyrl/200502030218.htm
[9] http://www.oecd.org/dataoecd/22/37/7350457.pdf

Consistency of under-representation in entrepreneurship is not only caused by the lack of female entrepreneurs, but is also by size bias in China. Small enterprises owned by women may not be regarded as companies and thus are ignored both in surveys and also in real life. Even though the original study sampled individual business (getihu) and enterprises (siying qiye), the study focused on the available enterprise (siying qiye) portion of the dataset, which was comprised of a total of 2,878 firms. According to a regulation called "Provisional Regulations of the People's Republic of China on Private Enterprises", "Siying qiye" means "private enterprises" in Chinese, which was defined in 1988 as "a profit-making economic entity employing at least eight individuals with private ownership"[10]; if there were less than eight employees, such enterprises could only be regarded as "Ge ti hu" (Private business)[11]. The private business' ownership may be in the form of proprietorship, partnership, or Limited Liability Company. Such organizations were free to set up joint ventures with other economic organizations, within or outside China. Thus, individual businesses (Getihu) were excluded in the sample because of legitimacy. In other words, oversampling eliminated small private enterprises, where a lot of female entrepreneurs were located.

As in western developed economies, self-employed people are regarded as business owners and entrepreneurs, but in China, the legitimacy of such businesses is still not convincing and are ignored. Based on Cliff's (1997) research, female entrepreneurs business' were usually smaller in size, especially small when starting out. Thus in the data, only 14% of entrepreneurs were women, but actually there were more female entrepreneurs in firms with less than three employees. Even though this size-bias problem during the survey may have caused limitations for this research, the research based on national data to looking into gender difference, is still as reliable as the newest empirical research into the gender of entrepreneurs.

[10] The definition is found from Provisional Regulations of the People's Republic of China on Private Enterprises, still valid.
[11] It was valid until January 1, 2008.http://www.chinalawedu.com/news/23223/23228/23840.htm

### 3.2 Statistical analysis

In this section, the summary statistics for the demographic character of female entrepreneurs will be offered, so as to compare the different characteristics between Chinese female entrepreneurs and their male counterparts and to test whether such differences affect performance to the same extent. Those characteristics such as risk-taking, innovation, resources, and management, as discussed in the theoretical literature were causes by performance difference. They are also independent variables that the author chooses to analyze.

#### 3.2.1 Independent variables

Four categories of factors such risk-taking, innovation, resources, and management are considered. For each factor, this is a group of variables to measure. The author compares the mean of each variable by using the t -test to check if there is statistical difference between genders. By using the t-test for each variable, each time, a P value is used to judge whether there is statistical difference. If p value of the t-test is below 10%, the author regards the tested variable to be different distributed between genders; if the p value is above 10%, the author regards the variable to be the same across genders. By doing this, the author aims to discover factors which are distributed unevenly between genders. Such variables are used in the regression, and to explore if gender-different variables affect gender performance.

The dependent variable, performance proxies, is regressed upon a group of independent variables hypothesized to have an effect on performance. The author divides the data into two groups, male and female, and an OLS regression is used for each group. The resulting predicted value, if significant, can be interpreted as the impact factor for entrepreneur performance. By comparing the impact variables between two regression results, it can be concluded that different characteristics between two groups of entrepreneurs lead to different performances.

Table 1(in appendix) describes the measurement of the independent variables and table 2 (in the appendix) shows the summary of variables.

### 3.2.1.1 Summary statistics for risk

In order to compare those proposed variables mentioned in the theory which may exist as gender difference causing performance difference, T tests are used to compare the mean values of two groups, one group for men, and the other group for women.

In table 1 (see appendix), the first group of variables are ***expand***, ***relocate***, ***investabroad***, and ***gopublic***. As explained under table 1, ***expand*** is a proxy for the change in business operation sites in the past three years, so as to measure whether it has been expanded, remained as the status quo or whether it has shrank. ***Relocate*** is a proxy for whether the company has relocated its headquarters or not during the past three years. ***Investabroad*** is a proxy for the company's investing choice. G***opublic*** is a proxy for whether the company is under preparation to be listed, already listed, or without such intention to be listed. Since every variable measures the strategy that the boss chooses for the company, it is quite representative of the entrepreneur's risk-taking ability. Table 3 shows the T-test results for hypothesis 1: risk-averse difference. It can be concluded that women are more risk-averse than men.

Table 3: T-test Result for risk-taking variable difference between genders

| Gender | Variable | Frequency | Mean | P value |
|---|---|---|---|---|
| Female | ***expand*** | 394 | 0.4112 | 0.0002*** |
| Male | | 2475 | 0.5123 | |
| Female | ***relocate*** | 394 | 0.3147 | 0.345 |
| Male | | 2475 | 0.3248 | |
| Female | ***investabroad*** | 394 | 0.0076 | 0.0897* |
| Male | | 2475 | 0.0166 | |
| Female | ***gopublic*** | 394 | 0.1015 | 0.1451 |
| Male | | 2475 | 0.1200 | |

Remark: *indicates the significant level of such difference. *p<0.10; **p<0.05; ***p<0.01.

The author discusses the variable on ***expand***. "-1" indicates the company has reduced operation areas in the last three years, and "1" indicates that the company has increased its operational areas during the last three years. The bigger the mean value,

the more likely the companies have increased their operational areas. Bigger operational sites are accompanied by potential business risks, such as exposure to government expropriation or possible business failure. Thus the difference in the expansion variable is a good measurement for risk-propensity. According to the p value generated by the t-test, which is lower than 0.01. It means that women are significantly less likely to expand operational sites during the last three years, suggesting that they are more risk-averse than their male counterparts.

The second variable is ***relocation***. It is a dummy variable indicated in table 1, the mean value can be regarded as a percentage of relocated companies. 32.48% of male-run business have relocated their business headquaters, while 31.47% of female-run business have. The p value (p=0.345) from the t-test, is not significant, indicating there are no obvious differences.

The third risk-measure variable is the willingness to invest abroad, ***investabroad***, a dummy variable. Less than 0.76% female entrepreneurs are considering investing abroad or have already done so, while the number for male entrepreneurs is 1.66%. That means that there are very few entrepreneurs considering overseas investment. Among those pioneers who have invested abroad or are going to do so, there are more men than women, as their base quantity and percentage are both bigger than that for the females. It's significant (p=8.97%) that men takes more risks on overseas investment decisions. ***Investabroad*** is a good measure for risk feature, as overseas operations exist in a different system with new laws, languages, labor force relations, and politics is always regarded as high-risk activities.

The fourth risk-proxy variable is ***gopublic***, measuring the intention to go public. Being a listed company in China indicates closer regulation by state owned organizations, such as the China Securities Regulatory Commission (working as the Securities and Exchange Commission in America and the Securities and Futures Commission in Hong Kong). It also indicates that the company is large scale and could face a higher risk of regulation and expropriation. The bigger the value is, the less willing the company is to go public. 10.15% of female entrepreneurs have

intentions to get listed or have already done so, while 12% of male entrepreneurs are going to be listed or have been listed. Although there are more male entrepreneurs involved, the difference is not quite obvious (p=14.51%).

Therefore, as discussed above, women are less likely to expand their operation sites and less likely to invest overseas, it can be concluded that women are more risk-averse in these two features. Therefore ***hypothesis 1*** is rejected, as gender difference in risk variables does exist.

#### 3.2.1.2 Summary statistics for resources

As proposed by hypothesis 2, 3, and 4, there are no gender differences in economic capital, human capital and social capital. In table 1 (see Appendix), ***owninitial*** and ***bankloan*** are chosen to measure the economic capital of the entrepreneur. ***Owninitial*** is the percentage of self-owned paid-in capital at startup. ***Bankloan*** is the percentage of liquid loan with ratio to liquid asset in 2005. ***Seniorstaff*** is a variable chosen to measure human capital in the private enterprise. Goverment share (***govshare***), peoples representative (***pplrep***), imposed fee (***fee***), party membership (***partymember***) and political status perception (***polstatus***) are five variables chosen to measure the vertical social capital. Corresponding basic summary statistics are shown in table 3 (see appendix). T-tests are done with all the three sorts of resources variables so as to probe into differences and the results is shown in Table 4.

There are two variables representing economic capital: ***owninitial*** and ***bankloan***. Since ***owninitial*** measures the percentage of paid-in initial capital owned by the owner or other individual at the startup phase, it is a good measurement for economic resources owned by an entrepreneur. As Table 4 shows, 94% of the paid-in capital is owned by female entrepreneurs and other individuals, and 96% of such capital is owned by male entrepreneuers and other individuals, there is no significant difference between the groups. This also indicates that in China, there are not many external resources to rely on at the early startingup phase, neither for men nor women.

And for the variable ***bankloan***, it measures the finance leverage of the company in daily operations: what the percentage of the floating assets are borrowed from banks? According to data analysis, 3.6% of male's floating funds are from bank loans, and 7.2% of the females' floating funds are from banks. The difference is not significant, as p=22.7% is not significant.

Neither of the two variables of economic capital has significant differences (p=14.8% for ***owninitial***, and p=22.7% for ***bankloan***). Therefore, **hypothesis 2** shows no gender difference in economic capital, so it cannot be rejected. It can be concluded that there is no difference in access to economic capital for entrepreneurs.

The second category of resources is human capital, and the only measurement for human capital is the ratio of senior staff among all employees (***seniorstaff***). And there are about 8% of senior staff in both female and male's business (p=36.1%, which is far bigger than the critical value of 10%), indicating that there is no human capital difference between genders. Thus **hypothesis 3** cannot be rejected. It can be concluded that there is no gender difference in human capital among entrepreneurs.

The last category of resources is social capital focusing on vertical social capital and political ties. There are five variables to measure this. Four of the variables are without significant differences. As for Table 4, on the average, about 1.1% of company shares are owned by the government when starting up, and half of all entrepreneurs are peoples' representatives. Both genders have to pay 2%-3% of the sales revenue for the imposed fee or for entertainment fee. Both genders perceive their political status as slightly higher than average person. In the 10-scale perception rank, men perceive themselves at a political status of 5.58 (the highest level of status is 10 and the lowest level is 0), and women perceive themselves at 5.61, slightly higher than their counterparts, but not significant (p=44.9%). Contrary to that proposed in the theoretical part, there are more female entrepreneurs as party members than their male counterparts. While 46% of female entrepreneurs are party members, only 30% of male entrepreneurs are party members; as government-owned shares and imposed fees are both small figures, and individual perception of political status is not too

reliable as it is only a "perception", not reality. The gap between average party member ratio is too big to be ignored (the percentage of party members among women is more than one and a half times higher than the percentage for male party membership). **Hypothesis 4** therefore cannot be rejected, and we conclude that there is no gender difference in vertical social capital between female entrepreneurs and their counterparts, except that female entrepreneurs are more involved in party membership.

Table 4: T-test Result for resources variable difference between genders

| Gender | Variable | Frequency | Mean | P value |
|---|---|---|---|---|
| Female | ***owninitial*** | 88 | 94.9886 | 0.148 |
| Male | | 712 | 96.6152 | |
| Female | ***bankloan*** | 63 | 7.3296 | 0.227 |
| Male | | 573 | 3.6003 | |
| Female | ***seniorstaff*** | 88 | 0.7634 | 0.361 |
| Male | | 712 | 0.7771 | |
| Female | ***gov share*** | 88 | 1.0909 | 0.487 |
| Male | | 712 | 1.0618 | |
| Female | ***pplrep*** | 88 | 0.5114 | 0.433 |
| Male | | 712 | 0.5309 | |
| Female | ***fee*** | 88 | 0.0225 | 0.432 |
| Male | | 711 | 0.0287 | |
| Female | ***Partymember*** | 88 | 0.4691 | 0.0013*** |
| Male | | 712 | 0.3068 | |
| Female | ***polstatus*** | 88 | 5.6136 | 0.449 |
| Male | | 712 | 5.5815 | |

Remark: *indicates the significant level of such difference. *p<0.10; **p<0.05; ***p<0.01.

The empirical results are quite surprising. It could be explained that even though there are much fewer entrepreneurs who are women, those who choose to become entrepreneurs are not at a disadvantaged position in society. Only those women who are endowed with much vertical social capital dare to choose to become entrepreneurs, and they are also more active in joining the Party.

Overall, there is no gender difference in economic capital, human capital and vertical social capital, except that female entrepreneurs are more involved in party membership than their male entrepreneurs. This may place them at a better position than their counterparts in regards to access to resources.

#### 3.2.1.3 Summary statistics for innovation

The third category of gender feature which might lead to performance difference, is innovation. As mentioned in the previous discussion, knowledge, as an important aspect of innovation, is difficult to quantify. Innovation input and output are used to probe into innovation difference between genders.

Some important innovation inputs are "fund" and "staff": the former is measured by investment on R&D with regard to sales revenue (***RD***); the latter is measured by the head count of technicians among all employees ***(techstaffratio)***.

As described in Table 1 (see appendix), the variables ***RD, newsale*** and ***technicalstaffratio*** are to measure innovation input. ***Association*** is to measure innovation intermediate product, and ***patents*** is to measure innovation output. Relevant summary statistics can be found in Table 2 (see appendix).

According to Table 5 (see below), both female and male entrepreneurs invest 2% to 3% of their sales revenue into R&D, and relocate 13% to 17% staff to technician positions. There are significantly more technicians in women-led business (16.34%>13.89%), and the significance level is 5%. That means women invest slightly but significantly, more on innovation than their male counterparts.

When considering innovation cluster and horizontal social network, which is an intermediate product between innovation input and output and measured by the variable associate, Table 5 shows that men are more involved in social networks than women. As ***associate*** measures the density of participating industry and business associations, on the average, a male entrepreneur joins 1.9 associations, while a female entrepreneur joins 1.7 associations. It is significant (p=2.79%) that female entrepreneurs are less involved in associations. In other words, female have less access to horizontal social capital and innovation clusters.

Innovation output, which is measured by two variables: ***newsales*** and ***patents***, indicate that 14.58% of the sales revenue in 2005 was contributed by new products sales in women-led business, while the number for men-led business was 18.62%. The difference is significant, with around a 5% significant level (p=5.09%). Although the difference of patents comparison is not significant, table 5 still shows that the average number of patents and designed items in women-led business is 12, while it is 19 in men-led business.

Table 5: T-test Results for innovation variable difference between genders

| Gender | Variable | Frequency | Mean | P value |
|---|---|---|---|---|
| Female | ***rd*** | 181 | 0.0376 | 0.206 |
| Male | | 1361 | 0.0281 | |
| Female | ***newsales*** | 182 | 0.1458 | 0.0509** |
| Male | | 1365 | 0.1863 | |
| Female | ***patent*** | 182 | 11.7473 | 0.369 |
| Male | | 1369 | 18.8780 | |
| Female | ***associate*** | 182 | 1.7582 | 0.0279** |
| Male | | 1369 | 1.9328 | |
| Female | ***techstaffratio*** | 182 | 0.1634 | 0.0206** |
| Male | | 1369 | 0.1389 | |

Based on Table 5 and relevant discussion about empirical results, **hypothesis 5**, no innovation difference exists, can therefore be rejected. It can be concluded that women invest more in innovaiton, are with less innovation intermidiate product and with fewer innovative intermediate products and fewer innovative final products compared to their male counterparts.

#### 3.2.1.4 Summary statistics for management

The last category of feature difference between entrepreneurs is different management styles. As discussed in theory, women are more likely to rely on long-term relationships and have a stronger sense of control, which causes different management style, leading to further performance differences.

As displayed by Table1, the last three variables, ***selfceo, selfmng*** and ***kinmng*** are proxies for measurement. The T-test is done on the three management variables. Test results are indicated in Table 6.

Table 6: T-test Result for management variable difference between genders

| Gender | Variable | Frequency | Mean | P value |
|---|---|---|---|---|
| Female | ***selfceo*** | 65 | 0.9231 | 0.376 |
| Male | | 598 | 0.9114 | |
| Female | ***selfmng*** | 65 | 0.5077 | 0.0271** |
| Male | | 598 | 0.3846 | |
| Female | ***kinmng*** | 65 | 1.8308 | 0.454 |
| Male | | 598 | 1.8712 | |

It can be seen that both female and male entrepreneurs are more likely to be CEOs by themselves and manage their operation of the business. In about 92% of the enterprises, the entrepreneurs start up the company and become CEO or presidents. There is no obvious difference between genders. On average, there are about 1.87

relatives of entrepreneurs among the top management level of the company. However, female entrepreneurs show a stronger sense of control when it comes to major decision making. About 51% of female bosses make their own decisions, while only 38% of male bosses make their own decisions, which is significantly different (p=2.71%, which is less than 5%).

Therefore, **hypothesis 6** is rejected. There is some gender difference in management style regarding major decision making, which could lead to further performance difference.

### 3.3. Empirical analysis

Based on the summary statistics and comparisons, there are gender difference on risk-taking **(H1)**, resources regarding vertical social capital **(H4)**, innovation (**H5**) and management style (**H6)**, but no gender difference in economic and human recourses.

There are differences in risk features on ***expand*** and ***investabroad***. Females are more risk averse in these two areas. There is a difference in resources, as **H4** suggests that women have more vertical social capital, which is represented by party membership. There is a difference in innovation. Although women invest more in innovation, they get fewer intermediate products and final products. They have more technicians in their companies, but they are less involved in associations and have lower sales revenues from new products. There is also a difference in management style. Female entrepreneurs are more likely to make major decisions by themselves. All the stated differences are likely to lead to different performances. Therefore, empirical analysis and regression is done to check whether such differences affect performance to the same extent. In order to observe the impact of the variables the author is interested in have on the dependent variable, some control variables were introduced, including firm age (***firmage***), company size measured by headcount of employees in 2005 (***size***), sales revenue in 2004 (***sale2004***) and also a location dummy to differentiate city and urban (***location***). A detailed variable description is in Appendix Table 1. Table 7 below shows the OLS regression result.

The observations have become so few, because in each group of variables, namely, risk, resources, innovation and management style, there were many dropouts. The observations are grouped by gender and regressed separately on the same variables. In total, 587 samples in the male group and 63 samples in the female group are regressed. The R square for the male group is 0.0872 and 0.2993 for female group. That means the goodness of fit for the male group regression is 9% and the goodness of fit for female group regression is 30%.

Table 7: OLS Regression for Sales Growth on Gender-different variables.

| | Male salesgrowth | | Female salesgrowth | |
|---|---|---|---|---|
| firmage | -0.0171 | 0.241 | -0.102** | 0.016 |
| | (-1.17) | | (-2.49) | |
| size | 0.000217** | 0.017 | -0.000105 | 0.490 |
| | (2.39) | | (-0.69) | |
| sale2004 | -0.00000577 | 0.328 | -0.00000107 | 0.920 |
| | (-0.98) | | (-0.10) | |
| location | 0.182 | 0.117 | -0.222 | 0.394 |
| | (1.57) | | (-0.86) | |
| expand | 0.0144 | 0.895 | 0.506** | 0.050 |
| | (0.13) | | (2.01) | |
| investabroad | -0.412 | 0.272 | 1.555 | 0.144 |
| | (-1.10) | | (1.48) | |
| techstaffratio | 0.587 | 0.165 | -0.933 | 0.153 |
| | (1.39) | | (-1.45) | |
| associate | -0.0575 | 0.263 | -0.190* | 0.095 |
| | (-1.12) | | (-1.70) | |
| newsales | 1.102*** | 0.000 | -0.241 | 0.609 |
| | (5.98) | | (-0.51) | |
| partymember | -0.1000 | 0.376 | -0.208 | 0.506 |
| | (-0.89) | | (-0.67) | |
| selfmng | -0.184 | 0.121 | -0.658** | 0.015 |
| | (-1.55) | | (-2.53) | |
| _cons | 0.473** | 0.010 | 2.051*** | 0.000 |
| | (2.58) | | (5.20) | |
| *N* | 587 | | 63 | |

Remarks: 1. t statistics in parentheses 2. * p < 0.10, ** p < 0.05, *** p < 0.01 3. R2=0.0872 for male group, R2=0.2993 for female group

According to Table 7, the regression result is discussed. Among the control variables, ***Firmage*** is found to significantly (p=0.016) and negatively affect the performance of female-led enterprises. The parameter before ***firmage*** is 0.102, suggesting that if one female-led business is one year younger than the other female-led busines, given the other conditions the same, the sales growth is 10% higher in the former company. ***Size*** is found to significantly and positively affect male's performance, but the parameter and impact factor is too small (0.000217) to be considered. ***Sales2004*** slightly and negatively affect firm performance for both genders, but not significantly. There are rural-urban differences with regard to performance: the parameter before ***location*** is positive for male-led firm, but negative for female-led firm, even though neither is significant. It indicates Chinese female entrepreneurs perform better in rural areas but perform worse in urban areas; while it is opposite for their counterparts. The reason may be female entrepreneurs find competitive edge and niche market in rural areas, but they are not so used to complicated urban and cosmopolitan market.

The discussion on the variables the author is interested follows. First, the difference between ***expand*** impacts performance differently. The expansion in operating areas is positively related with sales growth both for men and women, as are the signs of coefficient before expand variables are both positive. As the P value for female group is 0.05, it means that ***expansion*** significantly impact firm's sales growth at 5% significance level. If a female entrepreneur reduces the business areas of her company, sales growth could drop by 50.6%, suggested by the parameter of ***expand;*** and if she increase business areas, it is accompanied with a 50.6% sales growth. The impact factor for male-run companies is not clear, as the P value is 0.895, thus the coefficient for ***expand*** cannot tell us much. The difference in such risk variable suggests that females' risk-averse characteristic retards their business from growing.

The second different variable is ***investmentabroad.*** Even though there are more men than women involved in overseas investment, business sales growth is negatively correlated with overseas investment by men, but positively correlated with overseas investment by women, since the coefficient for investing abroad is -0.412 for men but

1.555 for women. Even though neither of the parameters is significant, it still indicates men's risk-loving characteristic affect performance negatively, while women's risk-averse characteristic affect performance positively.

The third different variable is the technician's ratio among employees ***(techstaffratio)***. The coefficient of that variable is negative for women (-0.933) but positive for men (0.587). Neither is significant. It means women's investments in innovation leads to poorer results but such investment in technicians from men leads to improved performance. The efficiency of hiring more technicians is low and may even be negative, but so far, women have been investing more in technical staff and innovation.

Let us consider the variable of ***associate***. Women are less involved in associations. Fortunately, ***associate*** is proven to be both negative for men (-0.0575) and women (-0.190). This means that involvements in business associations are counter-productive and lead to bad performance. Such effect is significantly negative for women (under 10% significance level), as the p value is 0.095. It suggest that if a female entrepreneur joins one more industry association administered by government or industry organization, the sales growth in their business drops by 19%, but male-led businesses suffer less from involvement in business associations, as the parameter is only 0.0575. The results indicate the business association in China do not favor performance in female-run companies.

The difference in ***newsales*** affects performance differently. According to summary statistics, male-led businesses have significantly more sales revenue from new products. Their sales growth is significantly spurred by new sales ratio (p=0.000, it is significant under 0.1% significance level). The parameter for ***newsales***, 1.102, means that if the new product sales revenue increase by 1%, the sales growth rate in this year will increase 110.2% (whilst holding the other variables constant). But the new product sales revenue ratio act differently in female-led businesses. ***Newsales*** is negatively correlated with sales growth, as the parameter of new sales is -0.241. That suggests new sales revenue has a crowding out effect for female-led business but has inducing effect for men-led business.

There are more women involved in party membership (***partymember***) according to summary statistics. Such a variable affects company performance negatively, both for men and women, even though it is not significant. That can be seen from the parameter of such a variable: -0.100 for men and -0.208 for women. It suggests that since reforms have been going on for thirty years, markets mature and the extra profits extracted from administration command have faded. The economy has been steered towards a mature market economy, where markets rather than commands, act as orders and competition rules, and investment in party member social networks is wasted. More female entrepreneurs have been more involved in party membership, and the negative impact from party membership is greater for women (the absolute value of its parameter for women is bigger than that for men)

Another gender difference is in management style: women tend to make more major decisions by themselves. Making decisions by oneself is negatively correlated both for men and women, as the signs of the parameter are both negative. The p-value of ***selfmng*** is 0.015 and the coefficient of ***selfmng*** is -0.658 for female entreprneuers, which mean that female-run companies are significantly and negatively affected by females' management style. Female-led businesses are suffering more from their bosses' dictatorship style. Such major decision-making style does greater harm to performance in female-run businesses, compared to their male counterparts.

The last variable we should look at is the ***Constance***, indicating the gender-similar traits. Despite the gender differences we discussed, there are a lot of aspects where female entrepreneurs act the same as their counterparts, and even though gender difference affects performance, there are a lot of other gender-similar factors determining performance. Such determinants are both positively and significantly related with performance, as the parameters of the constant is 0.473 for men and 2.051 for women, and the p value is 0.01 for men and 0.000 for women.

Due to the characteristics of cross-sectional data being adopted, there is the potential problem of multicollinearity, which may affect the reliability of regression results. In order to check the robustness of the regression result, a check is done for

the correlation between the independent variables that the author is interested in. Correlation results are displayed in Table 8.

Table 8: Correlation among the independent variables

| | expand | techstaffratio | techst~o | associ~e | newsales | partym~r | selfmng |
|---|---|---|---|---|---|---|---|
| expand | 1 | | | | | | |
| investabroad | 0.058 | 1 | | | | | |
| techstaffratio | -0.0368 | 0.0558 | 1 | | | | |
| associate | 0.1947 | 0.1235 | -0.0102 | 1 | | | |
| newsales | 0.18 | 0.0199 | -0.0414 | 0.1268 | 1 | | |
| partymember | 0.0398 | 0.036 | -0.0252 | 0.0837 | 0.0309 | 1 | |
| selfmng | -0.095 | -0.0876 | -0.0417 | -0.2058 | -0.1004 | -0.1737 | 1 |

The correlation coefficient between any of the two variables is lower than 0.2, so there is no obvious correlation between the variables. That indicates that there is no obvious multicollinearity.

## 4. Conclusion and Implication

According to the empirical analysis, it can be concluded that Chinese' female entrepreneurs' risk feature is positively associated with company performance, but their innovation input is negatively associated with performance. Meanwhile, they are more involved in party membership and are more decisive on major actions than their male counterparts, which negatively affect enterprise performance. Besides, company performance is significantly affected by gender-similar traits.

The implication of such analysis is that there should be more female entrepreneurs to drive the further development of society. When we encourage entrepreneurial spirit in China, we should not ignore females' role in such economic and social transitions.

As Zhang Weiying, one of the most prestigious economists in China, talked about China's transition in the Davos World Economic Forum in December 2010, the transformation of China were realized through the efforts of entrepreneurs like Liu Chuanzhi, ex-CEO of Lenovo Group and were not driven by Zhou Xiaochuan, head of the China central bank. Here the author would like to emphasize the role of Chinese female entrepreneurs, further transformation of China's economy and that Chinese ideology towards females has much to do with female entrepreneurship.

When a society advances with institutional change, usually, economic changes happen first, followed by cultural change, and lastly politically change. The author regards the emergence of Chinese female entrepreneurs as an economic change for women. It shows a profile of bottom-up spontaneous evolution. Women's rights should not be regulated. When Chinese women entrepreneurs push the boundary of out-of-date regulations or restrictions, they should be protected and tolerated. If they can do well in such deficit conditions, they should be allowed to thrive. The state should not impose unreasonable restrictions on Chinese female entrepreneurs but should respect market economy and entrepreneurship.

What's more, if the environment can be improved for them, the benefits female entrepreneurs can bring to society will be even bigger. This is no easy task, as the other tasks in the transition were.

The entrepreneurial investment brings about productivity improvement, while the national investment, used to boost demand and short-term economy, crowd out viable economic force. Thus female entrepreneurship should be encouraged in China, not only as a function in the deepening of reform, but also as it functions well in social advancement.

## Reference


Acs, Z.J., Anselin L and Varga, A. 2002. "Patents and Innovation Counts as Measures of Regional Production of New Knowledge." *Research Policy*, 31(7), 1069-1085

Bathelt, H. 2004. "Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation." *Progress in Human Geography*, 28(1): 31-56.

Beaver, P.A., Hou, L. and Wang, X. 1995. "Rural Chinese Women: Two Faces of Economic Reform." *Modern China,* 21(2): 205-32

Becker, GS. 1964. "Human Capital*:* A Theoretical and Empirical Analysis with Special Reference to Education." National Bureau of Economic Research, New York.

Bian, Yanjie and Soon, Ang. 1997. "Guanxi Networks and Job Mobility in China and Singapore." *Social Forces*,75: 981-1006.

Bian, Y. and Qiu H. 2000. "The social capital of enterprises and its efficiency*"*, *Social Sciences in China*, 2: 87-99*,* in Chinese.

Bourdieu, Pierre., 1986, "The Forms of Social Capital".241-258， in *Handbook of Theory and Research for the Sociology of Education*， edited by John G.Richardson Westport，C.T.:Greenwood Press.

Brockhaus, Robert H.,Sr. 1980, "Risk Taking Propensity of Entrepreneurs," *Academy of Management Journal* , 23: 509-520

Burt，R.S. 2000, "Structural Holes Versus Network Closure as Social Capital"，in Lin，N，Cook ，C.S.，Burt ，R.S. (eds), *Social capital：Theory and Research*, New York，Aldine de Gruyter.

Cai, Fang; Du, Yang and Wang, Meiyan, 2005, Chinese Labor Market Transition and Development, The Commercial Press, in Chinese.

Carland, J.A.C., & Carland, J.W. 1991. “An empirical investigation into the distinctions between male and female entrepreneurs managers. ” *International Small Business Journal,* 9(3): 62-72

Carter, Nancy M., Candida G. Brush, Patricia G. Greene, Elizabeth Gatewood, and Myra M. Hart. 2003. “Women Entrepreneurs who Break Through to Equity Financing: The Influence of Human, Social and Financial Capital.” *Venture Capital,* 5(1): 1-28.

Chen, Jianbao; Duan Jinghui, 2009, “Quantile Regression Analysis on Chinese Gender Wage Gap”, *Journal of Quantitative and Technical Economics*, 10: 87-98, in Chinese.

China Statistic Yearbook , 2008 & 2009, China Statistics Press, 2008 &2009.

Cliff, Jennifer E. 1998. “Does One Size Fit All*?* Exploring the Relationships Between Attitudes Towards Growth, Gender, and Business Size”, *Journal of Business Venturing*, 13: 523-542.

Cohen, Wesley M. and Levinthal, Daniel A.1990 “Absorptive capacity: a new perspective on learning and innovation-Technology, Organizations, and Innovation” *Administrative Science Quarterly*, 35:128-152

Coleman, James S. (*1988*). “Social Capital in the Creation of Human Capital,” *American Journal of Sociology*. 94:S95-S120

Conner, K.R. 1991, “A Historical Comparison of Resource-Based View and Five Schools of Thought within Industrial Organization Economics: Do We Have a New Theory of the Firm?” *Journal of Management*, 17(1):121–154.

Cooper, A.C.; Gimeno-Gascon,F.J.; and Woo,C.Y., 1994, “Initial human and financial capital predictors of new venture performance.” *Journal of business venturing*,9(5): 371-395

Cuddington. John T, Moss. Diana L. 2001. “Technological Change, Depletion, and the U.S. Petroleum Industry.” *The American Economic Review*, 91: 1135−1148

Elizabeth A. Smith, 2001, "The role of tacit and explicit knowledge in the workplace", *Journal of Knowledge Management*, 5(4): 311-321

Faccio, M., Masulis, R. W. and McConnell, J. J. *2006*, "Political Connections and Corporate Bailouts." *The Journal of Finance*, 61: 2597–2635.

Firkin, P., 2001, *Entrepreneurial Capital: a Resource-based Conceptualisation of the Entrepreneurial Process*, working paper No. 7. Labour Market Dynamics Research Programme, Albany and Palmerston North.

Granovetter, Mark. 1973, "The Strength of Weak Ties," *American Journal of Sociology*, 78(6):1360-1380

Hagedoorn, John, 1996. "Innovation and Entrepreneurship: Schumpeter Revisited," Industrial and Corporate Change, Oxford University Press, 5(3): 883-896.

Hay, R.K. and Ross, D.L 1989, "An assessment of success factors of non-urban start-up firms based upon financial characteristics of successful versus Failed Firms." *Frontier of Entrepreneurship Research*, 148-158

Hébert; Robert F. and Link; Albert N. 1989. "In search of the meaning of entrepreneurship." *Small Business Economics*, 1(1): 39-49

Hellman. Joel, Jones., Geraint, and Kaufmann, Daniel. , 2000, "Seize the State, Seize the Day: State Capture, Corruption, and Influence in Transition Economies," *Journal of Comparative Economics*. 31(4): 751-773

Hisrich, R., and Brush, C., 1984. "The Woman Entrepreneur: management Skills and Business Problems." *Journal of Small Business Management*, 22(1): 30-37

Huang, Yasheng. 2008, Capitalism with Chinese Characteristics: Entrepreneurship and the State, New York: Cambridge University Press.

Jarillo, J. C. 1989. "Entrepreneurship and growth: The strategic use of external resources. " *Journal of Business Venturing*, 4: 133-147

Knack, Stephen and Keefer, Philip, 1997. "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation". *Quarterly Journal of Economics*, 112(4): 1251-1288

Kortum, Samuel and Lerner. Josh, 1998, "Stronger Protection or Technological Revolution: What is Behind the Recent Surge in Patenting?" *Carnegir-Rochester Conference Series on Public Policy*, 48: 247-304

Li, Shaomin, Ilan Vertinsky and Dongsheng Zhou. 2004. "The Emergence of Private Ownership in China", *Journal of Business Research*, 57: 1145-1152.

Lin, N., Ensel, W.M., and Vaughn, J.C. 1981. "Social resources and strength of ties: Structural factors in occupational status attainment," *American Sociological Review*, 46(4): 393-405.

Liu, Xiuwu. *2001*. Jumping into the Sea: From Academics to Entrepreneurs in South China. " New York, Rowman & Littlefield Publishers.

Loury, G. C. (1987). "Why should we care about group inequality? " *Social Philosophy* & *Policy*, *5*: 249-271.

Luo, Dang-lun., Liu, Xiao-long: "Political Relationship, Barriers to Entry and Enterprise Performance: the evidences from the privately listed enterprises" [A];[C];2008, The proceeding of the third Annual Conference of the China Management Society, in Chinese.

Martínez, J, Stöhr, B. and Quiroga, B. 2007. Family Ownership and Firm Performance: Evidence From Public Companies in Chile. *Family Business Review*, *20*(*2*), *83*-94

Maury, *B.,* 2006, *"*Family ownership and firm performance*:* Empirical evidence from Western. European corporations*," Journal of Corporate Finance*, 12, 321-341.

McMillan, John and Christopher Woodruff. 2001. "The Central Role of Entrepreneurs in Transition Economies," *Journal of Economic Perspectives*, 16(3): 153-170.

Naughton; Barry.2007.The Chinese Economy: Transition and Growth, The MIT Press

Naibitt, John and Naibitt, Dorris., 2009, China's Megatrends: The 8 Pillars of a New Society, New York, Harper Business Press

Nee,Victor., 1989. "A Theory of Market Transition: From Redistribution to Markets in State Socialism."*American Sociological Review*. 54:663-81

Nee. Victor, 1992. "Organizational dynamics of market transition: Hybrid forms, property rights, and mixed economy in China. "*Administrative Science Quarterly*, 37: 1-27

Nee, Victorand Opper, Sonja, 2006. "China's Politicized Capitalism." Background paper for Dancing with Giants: China, India, and the Global Economy. Institute for Policy Studies and the World Bank, Washington, DC.

Nelson,R., and Rosenberg. N.,1993. Technical Innovation and National System. In R. Nelson(ed.) National Innovation System: A Comparative Analysis. New York: Oxford University Press.

Nonaka, Ikujiro., and Takeuch, Hirotaka, 1995, "The Knowledge-Creating Company", Oxford University Press

Orser, B., A. Riding and K. Manley. *2006*. " Women Entrepreneurs and Financial Capital," *Entrepreneurship Theory and Practice*. 30(5): 643-65

Peña, I. (2002*). "*Intellectual capital and business start-up success*. " Journal of Intellectual Capital*, 3(2): 180–198.

Peters, Bethany & Stringham, Edward. 2006, *"*No Booze*?* You May Lose: Why Drinkers Earn More Money Than Nondrinkers*", Journal of Labor Research,* 27( 3): 411-421.

Polanyi, M. 1958, Personal Knowledge, London: Routledge. , (1967), The Tacit Dimension, New York: Doubleday / Anchor Books.

Portes, A. *1998*. "Social capital: Its origins and applications in modern sociology. " *Annual Review of Sociology, 24*: *1-24*

Rod Farr-Wharton, Yvonne Brunetto, 2009. "Female entrepreneurs as managers: The role of social capital in facilitating a learning culture" *Gender in Management: An International Journal*. 24(1):14-31.

Rosenberg. Nathan, 1983, Inside the Black Box, Technology and Economics, Cambridge University Press.

Rossman, Marlene L. 1991. The International Business Woman of the 1990s: A Guide to Success in the Global Marketplace, Praeger, New York, NY

Schultz, T. W. *1959*. "Investment in Man: An Economist's View." *The Social Service Review*. 33:109-17.

Schumpeter, Joseph A, 1942 Capitalism, Socialism, and Democracy. New York. Harper and Row.

Seet, P-S., Ahmad, N.H. and Seet, L-C. *(*2008*)* "Singapore's female entrepreneurs: are they different*?*" *Int. J. Entrepreneurship and Small Business*, *5*: 257–271

Sexton, Donald and Bowman-Upton, Nancy, 1990, "Female and Male Entrepreneurs: Psychological Characteristics and Their Role in Gender-Related Discrimination," *Journal of Business Venturing,* 5: 29-36.

Shane, S., Kolvereid, L., & Westhead, P.1991. "An exploratory examination of the reasons leading to new firm formation across country and gender," *Journal of Business Venturing*, 6:431-446.

Shelton, Lois M. 2006. "Female Entrepreneurs, Work–Family Conflict, and Venture Performance: New Insights into the Work–Family Interface", *Journal of Small Business Management*, 44(2): 285-297.

Shi, Junwei., Hu, Lijun., & Fu, Haiyan. 2007. "Structure of impacts of enterprise social capital: An empirical analysis on listed companies in China." *China Industry Economy*, 2:84-93, in Chinese.

Simon, H. A. 1986. What we know about the creative process. In *R. L.* Kuhn (Ed.), *Frontiers in creative and innovative management.* 3-22. Cambridge, MA: Ballinger

Smith, Elizabeth. 2001 "The role of tacit and *explicit* knowledge in the workplace", *Journal of Knowledge Management*, 5 (4): 311-321.

Stevenson, Howard H. 1999 /1983/. "A Perspective on Entrepreneurship." In The. *Entrepreneurial Venture*, 2nd ed. Boston, MA: Harvard Business School Press.

Tsui, A. S., Pearce, J. L., Porter, L. W., & Tripoli, A. M. 1997. "Alternative approaches to the employee– organization relationship: does investment pay off?" *Academy of Management Journal*, 40: 1089–1121.

Von Hippel, Erik. 1994. "'Sticky Information' and the Locus of Problem Solving: Implications for Innovation." *Management Science*, 40(4)：429-439.

Weick, K.E. 1996. "An appreciation of social context: One legacy of Gerald Salancik." *Administrative Science Quarterly* 41: 563-573.

Welter, F. 2004. "The Environment for Female Entrepreneurship in Germany". J*ournal of Small Business and Enterprise Development*, 11:212-21.

Wu, Wei-ping, 2008, "Dimensions of Social Capital and Firm Competitiveness Improvement: The Mediating Role of Information Sharing", *Journal of Management Studies* 45 (1): 122-146.

Xinhua News,. (2010, 12 27). Chinese local governments increasingly dependent on land-use charges: report. Retrieved 01 20, 2011, from http://news.xinhuanet.com/english2010/china/2010-12/27/c_13666277.htm

Zander, Udo and Kogut, Bruce.1995. "Knowledge and the Speed of the Transfer and Imitaion of Orgnizational Capabilities: An Empirical Test." *Organization Science*, 6(1):76-92.

## APPENDIX

Table. 1 Measures of independent variables

| Indep Variables | Measurement | Code |
|---|---|---|
| **Risk taking** | | |
| ***Expand*** | The change of operation areas in recent 3 years, decrease is "-1", no change is "0", increase is "1" | b19e |
| ***Relocate*** | Head quarter of biz relocated or not, dummy, 1 for yes | b19c |
| ***Investarboad*** | How much has the company investment abroad, dummy, 0 for 0 dollar overseas investment, 1 for others. | b34b1 |
| ***Gopublic*** | Any plan to go public , no plan is "0"; listed, prepare, plan are "1" | b25 |
| **Innovation** | | |
| ***RD*** | R&D invest in 2005 divided by sales revenue in 2004 | b21a1/b22a2a |
| ***newsales*** | New products sales revenue divided by sales revenue in 2005 | b21a2/b22a4a |
| ***patent*** | The total number of patents, invention or self-designed products | b21b1+b21b2 |
| ***associate*** | Membership in gov-lead industry association, business and commerce association or other industry associations. If it joins any group, plus 1 in its value; if not join, it is 0. It measures the density of its networks. | b40a1+b40a2+b40a3 |
| ***TechStaff Ratio*** | Technician headcount divided by total employee headcount in 2005 | B31b1d/b31b1a |
| **Resources** | | |
| ***owninitial*** | The ratio of paid-in capital owned by owner himself or herself and other individual at starting up phase | b16a1a+b16a2a |
| ***bankloan*** | How much of the liquid capital was borrowed from | (b24a3a+b24a3b+b24a3c+b2 |

| | | |
|---|---|---|
| | banks in 2005 required liquid assets | 4a3d+b24a3e+b24a3f)/ b24a2 |
| ***seniorstaff*** | How many employees are hired over a year divided by total headcount of employees in 2005 | b31b1a-b31b2a-b31b2b/b31 b1a |
| ***gov share*** | The ratio of paid-in capital at start-up owned by SOE, TVE or multi-level government | b16a3a+b16a4a+b16a7a |
| ***pplrep*** | Which level of peoples' representative, if no, it's 0; town level, 1; county level, 2; city level, 3; provincial level, 4; national level, 6. | a6a1 |
| ***fee*** | The expense apportion and PR entertainment fee divided by sales revenue in 2005 | (b23c+b23e)/b22a4a |
| ***partymember*** | Whether the entrepreneur is communist party member or democratic party member, 1 for either, 0 for neither. | a5 |
| ***polstatus*** | Entrepreneurs' own perception for their political status, from 1 to 10, 1 is the highest level. | a12c |
| **Management** | | |
| ***selfceo*** | Entrepreneur himself or herself is the president or CEO of the company, 1 for yes, 0 for no. | b29a |
| ***selfmgr*** | Whether the boss make major decisions by themselves; 1 for yes, 0 for no. | b30a |
| ***kinmgr*** | How many close relatives (parents, spouse, siblings, and children) are there in shareholders, board of directors and top executives? | b30c1+b30c2+b30c3 |
| ***firmage*** | How many years has the firm existed? | 2006-b14 |
| ***size*** | How many employees were there in 2005? | b31b1a |
| ***sale2004*** | Sales revenue in 2004. | b22a2a |
| ***location*** | Dummy variable. If the firm was in big, medium cities and development zones, the value is "1"; if the firm was in town and villages, the value is "0". | b19d |

Table2: Descriptive statistics for the independent variables

| Obs | Variable | Mean | Std Dev | Min | Max |
|---|---|---|---|---|---|
| 2869 | ***expand*** | 0.498 | 0.531 | -1 | 1 |
| 2869 | ***Relocate*** | 0.323 | 0.468 | 0 | 1 |
| 2869 | ***Investarboad*** | 0.015 | 0.123 | 0 | 1 |
| 2869 | ***Gopublic*** | 0.117 | 0.322 | 0 | 1 |
| 801 | ***owninitial*** | 96.441 | 13.738 | 0 | 100 |
| 636 | ***bankloan*** | 3.970 | 29.410 | 0 | 625 |
| 801 | ***seniorstaff*** | 0.776 | 0.339 | -1 | 1 |
| 801 | ***gov share*** | 1.064 | 8.046 | 0 | 100 |
| 801 | ***pplrep*** | 0.528 | 1.026 | 0 | 5 |
| 800 | ***fee*** | 0.028 | 0.321 | 0 | 9 |
| 801 | ***Partymember*** | 0.451 | 0.498 | 0 | 1 |
| 800 | ***polstatus*** | 5.585 | 2.106 | 0 | 10 |
| 1542 | ***Rdshare*** | 0.029 | 0.147 | 0 | 3.33 |
| 1547 | ***newsales*** | 0.182 | 0.313 | 0 | 1 |
| 1551 | ***patent*** | 18.041 | 269.958 | 0 | 10001 |
| 1357 | ***associate*** | 1.912 | 1.157 | 0 | 3 |
| 1551 | ***techstaffratio*** | 0.142 | 0.152 | 0 | 2 |
| 663 | ***selfceo*** | 0.913 | 0.283 | 0 | 1 |
| 663 | ***Selfmgr*** | 0.397 | 0.490 | 0 | 1 |
| 663 | ***kinmgr*** | 1.867 | 2.701 | 0 | 26 |
| 652 | ***firmage*** | 7.230061 | 3.945771 | 2 | 20 |
| 652 | ***size*** | 242.9294 | 755.3945 | 1 | 9548 |
| 652 | ***sale2004*** | 3796.845 | 11909.44 | 0 | 189000 |
| 652 | ***location*** | .5858896 | .4929459 | 0 | 1 |