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**WMG, University of Warwick**

**A Growth Predictive System for Chinese SMEs**

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A thesis presented in fulfilment of the requirements for the degree of

Doctor of Philosophy

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## **Abstract**

In China, research into SME growth has become more important and has drawn considerable attention from both government and scholars. However, there is no universally accepted way to define and measure an SME's growth prospects, and traditional approaches have been criticized for encouraging short-termism, being backward-looking and inward-looking. Therefore, based on a comprehensive and systematic literature review on different aspects of SME growth, and the consensus achieved through using the Delphi technique among eleven experts including policy-makers, scholars and entrepreneurs, the growth predictive system was built in this paper using a holistic approach which incorporates multiple measures (financial and non-financial, backward looking and forward looking, external and internal elements) to allow users to gain a better understanding of Chinese SMEs' growth potential.

To validate the growth predictive system, the researcher collected data from 148 Chinese SMEs randomly selected, and did three tests for addressing three different questions: Whether the selected growth indicators can appropriately interpret each of the growth capabilities? Whether the calculated growth index (2012) of 148 Chinese SMEs has a positive correlation with the three years' actual profit growth rate (2012-2014)? Whether the growth rankings of local SMEs (Shenzhen) calculated by the predictive system has a good fit with the growth rankings provided by the local government? The answers to all these questions were "yes", so the growth predictive system developed in this paper has been validated.

By using the growth predictive system, the government could become more effective in their policy-making oriented towards SMEs; investors and financiers could make decisions logically rather than emotionally; and SMEs could more easily formulate business strategies in today's dynamic environment to give themselves sustainable competitive advantages over their counterparts.

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# 1 INTRODUCTION

## 1.1 Research background

Over the last couple of decades, dramatic changes have been witnessed in the global business environment. Declines in transportation, communications, and information management costs have reduced the importance of distances, while reductions of tariff and non-tariff barriers to trade and investment have eased the movement of goods and services among countries (Krywulak & Kukushkin, 2009). The term “global village” was first introduced by Wyndham (1984) to indicate this phenomenon. As a result, the international business arena is no longer dominated by large multinationals emanating from the world’s leading developed markets; the newly industrializing countries (NICs) have spawned a number of global players, and SMEs have begun to take on a more significant role in international business activity (Lenihan, Andreosso & Hart, 2010).

Since initiating the market-oriented reforms in 1978, China has shifted from a centrally planned to a market based economy and experienced the fastest growth in GDP per capita of any major economy in human history (World Bank Group, 2014). China’s fast-paced economic reforms after 1990s increasingly revealed that large state-owned enterprises (SOEs) were operationally disadvantaged and needed to address defects of corporate governance and implement incentives for sales and profits. Since the “Socialist Market Economy” was formally established in 1992 as

the governing principle for the new Chinese economy, large SOEs rapidly transformed into small and medium non-SOEs (Jing & McDermott, 2013). Although most SMEs in China came about in the last twenty years, they have been functioning vitally to help the economy soar in China and are key to the successful realization of the new “Five-Year-Plans”. In China, by the end of 2012, 13 million SMEs that make up over 99.3% of all enterprises had produced 60% of GDP, 60% of exports, contributed 50% of total taxation revenue and provided 80% of employment (China’s NBS, 2013).

However, after a period of rapid development, Chinese SMEs are facing a series of external and internal factors that could have significant adverse effects on their growth. In the macro context of world financial integration, SMEs are challenged because the sub-prime crisis in the U.S. and European sovereign-debt crisis severely damaged the growth of the world economy, caused a reduction in market demand and induced widespread trade protectionism. In the first half of 2013, China was hit by a total of 39 trade remedy investigations from 15 countries, which dented China’s efforts to expand further its foreign trade and has reported a year-on-year decline of 2% in its total import and export volume (Li, 2013). As a result of inflation, China is losing its competitive edge as a world manufacturing base. Similarly in the last few years because the RMB has been stronger, Chinese goods are more expensive in foreign markets, making it less competitive. Weakening domestic and international demand contributed to excess capacity in most sectors of the economy. Consequently,

Chinese SMEs are facing the double pressure of decreasing orders and increasing costs (Liu, 2012). Furthermore, the outdated management practices and imperfect government support system have impeded SMEs' transformation and upgrading process from labor-intensive to technology-intensive enterprises. As a result, most SMEs in China are still concentrated at the bottom of the global value chain, and more vulnerable to the rapidly changing technology and uncertain market conditions (Wang, 2012).

On the one hand, SMEs are important engines to stimulate the economic development of China; on the other hand, most of them are facing difficulties for growth as well as survival. The research field on SME growth has become more important and drawn considerable attention during this period from both government and scholars. But, research in this area has largely failed to generate cumulative results because these studies differ significantly with respect to their methods of measuring growth. Although much research has examined the different aspects of SME growth, no significant improvement has emerged. The data published in "Fortune" in 2011 showed that the average life expectancy of Chinese SMEs was 2.9 years compared with 7 years for US SMEs and 40 years for large enterprises worldwide. About 32% of Chinese SMEs survived for 5 years while only 13% lasted for 10 years (Wang, 2012). Thus, the study aims to join this rising academic debate in literature and aims to contribute to a reflection on how to define and evaluate the growth potential of Chinese SMEs. Without a clear definition for "growth-type SMEs" and a universally

accepted way of measuring SMEs' growth prospects, all theories on different aspects of SME growth are incomplete.

*Hence, this paper was undertaken to provide an empirical study that aims to build a growth predictive system for Chinese SMEs.*

## **1.2 Why is this topic timely and interesting to investigate?**

### 1.2.1 Current Situation

With the rapid growth of the Chinese economy, many kinds of SMEs have been established and gradually developed. They exert the same contribution as SMEs in other countries, which is mainly evidenced by their achievement of both economic and non-economic objectives, such as stimulating technological innovation, promoting employment, maintaining economic vitality, and so on (Zhou, 2004). In particular, the special nature of Chinese SMEs manifests their essential role in driving China's transition from a planned economy to a market economy (Li, 2013). But since the last decade, Chinese SMEs have been experiencing hardships. A nationwide survey in 2013 estimated that 15.8% of the country's SMEs were facing bankruptcy, 25% were operating at a loss while less than 30% were enjoying a comfortable profit margin of more than 5% (China's NBS, 2013). Although the government has launched many assistance schemes, no significant improvement has emerged.

## 1.2.2 Theoretical Gap

When researching the different aspects of SME growth - i.e. the determinants of growth, the growth process and patterns - it is first necessary to define growth and how a firm's growth is measured. There is no universally accepted way to measure a firm's growth and scholars use various growth indicators when researching the field (Barkham *et al.*, 1996). In Woldle *et al.*'s (2008) research devoted to the influence of the characteristics of the owner/managers on the growth of SMEs, growth is defined using sales. However, sales may overstate the firm growth as it does not only reflect the value-added of a company but also input prices. In Zhou's (2009) empirical analysis of determinants of a firm's growth, growth in employment is utilized as an indicator of the firm's growth. Obvious drawbacks are that this measure is affected by labor productivity increases, machine-for-man substitution, degree of integration and other make-or-buy decisions. In James *et al.*'s (2006) paper measuring the impact of government policy on SME growth, the term 'growth' means earning profits. However, the growth-profit relationship is only evident over long periods (Delmar *et al.*, 2003). Owing to a firm's arbitrary decisions (marketing strategies, financial decisions, etc.), it may choose to trade-off long term growth for short term profitability. There are also different ways of measuring growth but have some obvious shortcomings that limit their applicability. For example, market share can only be compared within industries for firms with a similar product range and does not allow for cross-sectoral comparisons (Grimsholm & Pobleto, 2010; Soini & Veseli,

2011). Measuring growth in assets may be problematic for the firms in industries where intangible assets are important (Fitzsimmons *et al.*, 2005). Return on investment, whilst being an appropriate high level measure for large companies, it fails to provide an objective assessment of SMEs that may be owner-managed (Fuller-love, 2006).

First, a number of scholars have noted that the diversity of measures used in SME growth studies severely impairs the ability of scholars to accumulate and compare results (Delmar *et al.*, 2003). Second, can these indicators accurately reflect a firm's growth prospects? The author's answer would be "no". Although much research has examined the different aspects of SME growth, no significant improvement has emerged and the real problem has boiled down to several misunderstandings around growth:

- **Short-termism:** According to Chen (2002), the sustainable growth of SMEs include not only the quantitative growth of financial indicators such as turnover and profit growth, but also a variety of intrinsic qualitative factors such as innovation and management capacity. Based on bionic philosophy, a firm's growth is the same as a child's development, which refers both to physical and mental development. However, the existing growth predictive systems encourage short-termism. SMEs pay more attention to "quantity" growth (physical) and neglect the improvement of "quality" (mental); they are keen on "big", while

ignoring the “strong”. This provides the best explanation of many cases where SMEs perform well today but go bankrupt tomorrow.

- **Mainly backward looking:** Each enterprise is a complex system and an organic integration of various resources. Its growth prospects is determined by a set of dynamic capabilities to excavate and utilize the resources (both internally and externally). However, the existing growth predictive systems only use historical (static) data and thus mainly backward looking (Chow & Stede, 2006). They show us only the outcomes from past decisions, and the past is no guarantee of future performance. This is like driving a car by looking in the rear-view mirror.
- **Too inward looking:** “The growth prospects of firms will depend on their ability to learn about their environment, and to link changes in their strategy choices to the changing configuration of that environment” (Geroski, 1995). Based on the principals of bionics, all living species exist within constantly evolving ecosystems and need to follow Darwin’s law of “survival of the fittest”, while enterprises operate in a complex and changing business environment and need to be highly adaptable in order to survive and grow. However, the existing growth predictive systems still suffer from being too inward looking, ignoring external environmental factors that affect the growth prospects of the business.

Hence, recognizing the inappropriateness of traditional approaches to growth measurement, SME growth should be predicted based on a holistic approach which incorporates financial and non-financial indicators, backward looking and forward

looking elements, external and internal factors. The author believes that the combination of these multiple measures helps to gain a wider perspective on predicting a firm's growth prospects.

### 1.2.3 Practical Contribution

The growth predictive system can be used by different roles for different purposes.

- In recent years, the Chinese SME sector has attracted more and more attention from the government due to its contribution to the economy. The government has enacted and amended policies and set up different programmes to encourage the development of Chinese SMEs. However, a nationwide survey shows that about 90% of SMEs still complain about the lack of assistance catering to their different needs (Liu, 2008). By using the growth predictive system, the government could become more effective in their policy-making oriented towards SMEs if they could better understand the true situation of the firm.
- There have been some performance measurement (PM) approaches designed and used in the large company context, such as balanced scorecard (BSC) and economic value analysis (EVA). However, SMEs are not just scaled down versions of large enterprises; they go about their business in a number of fundamentally different ways (Storey, 1994; Man *et al.*, 2002; Burns, 2007). By using the growth predictive system, investors and financiers could accurately



evaluate SMEs' growth potential, and make decisions logically rather than emotionally.

- There's a Chinese proverb that says "precise knowledge of self and precise knowledge of the threat leads to victory" (Sun Tzu). By introducing the growth index in the predictive system, the vertical and horizontal comparability improves dramatically. As a result, SMEs could more easily formulate business strategies in today's dynamic environment to give themselves the sustainable competitive advantages over their counterparts.

## **2 LITERATURE AND DOCUMENT REVIEW**

A research literature review, as a process, is a systematic, explicit, and reproducible method for identifying, evaluating and synthesizing the existing body of completed and recorded work produced by researchers, scholars and practitioners (Fink, 2010). In order to fulfill the objective of this paper, a systematic and comprehensive review of literature was conducted using using a variety of databases including journal articles, conference papers, books, dissertations and technical papers. The review covered two main areas relating to:

- Definition and characteristics of SMEs in China
- Different aspects of SME growth in China (growth definition and motivation, determinants of growth, growth process and patterns, performance measures)

### **2.1 Definition of SMEs in China**

“Small firms are much easier to describe than to define and to this day there is no generally agreed operational or numerical definition of what constitutes a small business” (Beaver, 2002: 56). The Bolton Committee’s Report on Small Business (1971) is one of the most widely quoted sources of definitions and understandings of SME sector. Bolton (1971) attempted to overcome the problem of SME definition by formulating what is called a “quantitative” definition and a “qualitative” definition.

From a quantitative point of view, SMEs are defined by their size. However, although the notion that SMEs play an important economic and social role seems to be well accepted, the statistical definition of an SME on the basis of a specific criterion is not uniform across countries (Ayyagari *et al.*, 2005). For example, the European Union defines a SME as fewer than 500 employees whereas South Korea classifies SME as fewer than 1,000 employees (OECD, 2009). According to figures from the Ministry of Industry and Information Technology (MITT, 2014), China now has more than 13 million SMEs across different industries, accounting for 99.3% of the country’s total number of enterprises. Recognizing that one criterion would not cover all different branches, the National Bureau of Statistics of China (2009) defines SMEs based on a combination among industry, number of employees, sales, and total assets (see table 1). This is the SME definition employed in this paper.

Size Category	Industries	Employment-based	Total assets	Business revenue
Small	Industry	< 300	<¥ 40million	< ¥ 30million
	Construction	< 600	<¥ 40million	<¥ 30million
	Wholesale	<100		<¥ 30million
	Retail	<100		<¥ 10million
	Transport	<500		<¥ 30million
	Post	<400		<¥ 30million
	Hotel & restaurant	<400		<¥ 30million
Medium	Industry	300- 2000	¥ 40million-400million	¥ 30million-300million
	Construction	600-3000	¥ 40million-400million	¥ 30million-300million
	Wholesale	100-200		¥ 30million-300million
	Retail	100-500		¥ 10million-150million
	Transport	500-3000		¥ 30million-300million
	Post	400-1000		¥ 30million-300million
	Hotel & restaurant	400-800		¥ 30million-150million

Table 1: SME definition in China (NBS, 2009)

Being a small firm is not just about size, defined in simple statistical terms, but also has important defining characteristics. As a result, the Bolton Committee (1971) formulated a qualitative definition and described a SME as satisfying three criteria: small share of marketplace, independent decision-making and personalized management. The argument behind the use of qualitative criteria is that they reflect some of the key, non-quantitative characteristics of SMEs, which differentiate them from larger firms (Greenne & Mole, 2006).

## **2.2 Characteristics of SMEs in China**

### **2.2.1 From a macro perspective**

Since the late 1970s, with the start of China's reforms, many kinds of SMEs have been established and gradually developed. The research field on SME growth has drawn considerable attention from both government and scholars because they are important for the achievement of both economic and non-economic objectives in China. According to China's National Bureau of Statistics (NBS, 2013), in 2012, 13 million SMEs produced 60% of GDP, 74.7% of industrial value added, contributed 50% of total taxation revenue and also provided 80% of urban and rural employment. After experiencing almost 40 years of evolution, China's SME sector demonstrates the following features:

### 2.2.1.1 Geographical distribution

Based on regional distribution (see figure 1), in 2012, 76.5% of SMEs are located in the eastern area of China, 15.5% in the mid-area of China, and 8% in the western part of China. SMEs in the top five provinces make up 48.4% of all SMEs, and these provinces (Guangdong, Zhejiang, Jiangsu, Shanghai and Shandong) are all located in the eastern area of China. Moreover, SMEs located in the western and central regions were considerably less competitive than their counterparts in the eastern region (Li, 2013). According to Fong's (2011) empirical analysis of this uneven geographical distribution, SMEs located in the western and central regions are generally exposed to fewer growth opportunities than those in the east because the latter have comparatively greater access to research and development skill pools, investment, and technology.

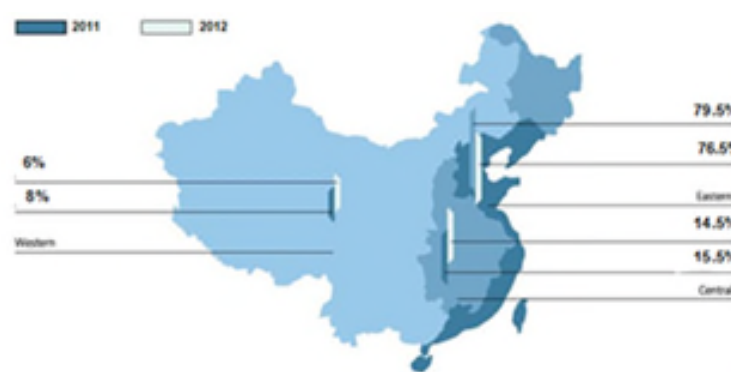


Figure 1: Geographical distribution of Chinese SMEs (Li, 2013)

### 2.2.1.2 Industry distribution

Analyzing statistically, it is important to note that in US SMEs, service firms operating in medium- and highly-technological intensive industries account for 88% of the total (USITC, 2010). On the contrary, manufacturing SMEs are pervasive in China in industries such as leather, shoes, clothing, machinery and equipment, home electrical appliances, toys and motorcycles, most of which are labor-intensive sectors. In Guangdong and Zhejiang provinces, where most of China's SMEs are located, manufacturing (known as secondary sector) is the most dominant industry accounting for more than 40% of the local workforce (see figure 2) (NBS, 2011).

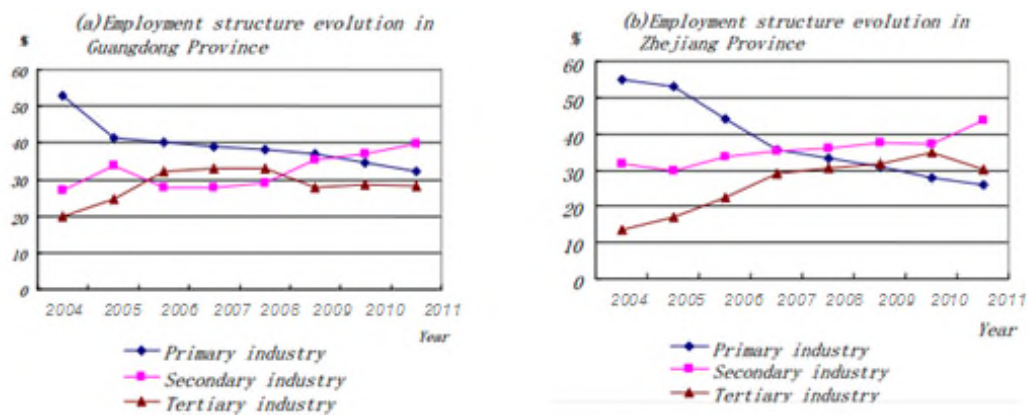


Figure 2: Industry distribution of Chinese SMEs (NBS, 2011)

According to a nationwide survey (PBC, 2011), labor-intensive manufacturing enterprises represent 60% of Chinese SMEs, whose competitive advantages derive from the abundance of cheap labor in China. However, they are facing the double

pressure of increasing costs and decreasing orders. Owing to the average annual 14% rise in wages during the past decade, the profit margins for most of Chinese SMEs are shrinking. As a result, China is losing its competitive edge as a world manufacturing base (Li, 2013). Furthermore, these traditional SMEs have only provided Original Equipment Manufacturer (OEM) products for the big buyers because of the lack of core competencies, but have not yet established a position in the international market. At present, owing to the impact of the financial crisis on global trade, countries are expected to protect their own economy, while most exported goods of China's SMEs are labor-intensive, low value-added and easily substitutable. As shown in figures of WTO, in the first half of 2013, China has reported a year-on-year decline of 3.1% in its exports (Zhao, 2013).

#### *2.2.1.3 Cluster distribution*

Cluster development has now become the main direction for the development of SMEs in China. Statistics show that in 2010, over 2,000 industry clusters of a considerable scale were formed in localities where regional advantages and characteristics were given play to guide SMEs to develop in specific clusters (Freisher *et al.*, 2010). This essentially illustrates the concept of "one town, one product" as exemplified by the cable town in Guanlin, the silk town in Shengze and the shoes town in Wenzhou. As shown in figure 3 below, most Chinese SME clusters are heavily concentrated in the Pearl River Delta Economic Zone, the Yangtze River

Delta Economic Zone, and the Bohai Rim Economic Zone. The GDP per capita in these areas is generally higher than the national average (NBS, 2011). Research by MITT (2014) shows that the presence of a large number of related enterprises in the same region will facilitate and stimulate networking and collaboration between all stakeholders, and finally contribute to enhance the local competitiveness.

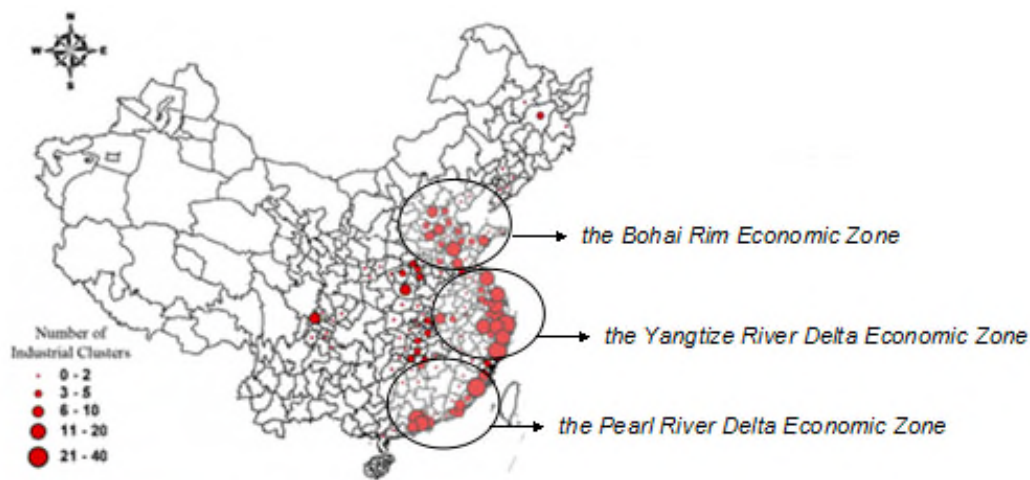


Figure 3: Map of SME clusters in China (NBS, 2011)

#### *2.2.1.4 Ownership structure*

Based on a survey conducted in 2010, family businesses, in which individuals or families own a controlling stake of more than 50%, make up 85.4% of SMEs in China (Xi, 2011). Academic research has been interested in the effects of ownership structure on firm performance already from 1970s. James (1999) suggested that family ties, loyalty, stability and insurance may provide incentives for family



managers to ensure the viability and competitiveness of the firm in the future. Casson (2002) also proposed that family owners find it important to pass their firm as a heritage to succeeding generations and thus, family members can be characterized as long-term owners. However, as the Chinese family business organizations grow, the weaknesses of their management will start to overrun the strengths. Examples of these are favoring family members at the expense of more talented non-family workers, conflicts between family members, and less access to capital markets (Kortelainen, 2007). It is estimated that 70% of Chinese family-owned businesses will not survive into the second generation and 90% will not make it to the third generation (Wah, 2001).

### 2.2.2 From a micro perspective

SMEs are not just scaled down versions of large enterprises; they go about their business in a number of fundamentally different ways (Storey, 1994; Man *et al.*, 2002; Burns, 2007). This overwhelming consensus among SME experts was firstly introduced by the Bolton Committee Report of 1971, which stated that “being a small firm is not just about size, but also has important defining characteristics”. Hence, the successful story of a large, multinational company cannot be a model for a small business, and understanding the characteristics of SMEs is important to the outcomes of this research.

### 2.2.2.1 Managerial characteristics of SMEs

The most consistent characteristic of the SME sector is its size. The small size of SMEs is directly reflected in their “simple organizational systems” (Nicolescu, 2009). Along with the flat organizational structure with few hierarchical managerial levels and the centralized decision-making process, SMEs tend to be managed in a relatively personalized way (Analoui & Karami, 2003; Chak, 1998). The term “ego firm” was firstly introduced by Torres (1999) to describe this characteristic of SMEs. According to Kraus and Kauranen (2009), in a multitude of SMEs, it is not the top management teams but the entrepreneur himself who is the enterprise’s main strategist, developing the vision, mission and strategies, and also implementing them. Burns (2007:14) also found that “the smaller the firm, the more important the personality and influence of the owner/managers”. As a result, various studies have revealed that the performance of SMEs is determined by the characteristics of the owner/managers (Lee & Tsang, 2001; Man *et al.*, 2002; Blackman, 2003; Nimalathasan, 2008; Wang *et al.*, 2010). Islam (2011) identified five major characteristics of SME owner/managers that appear to be consistently used in other entrepreneurial research studies, these are: demographic characteristics, individual background, personal traits, entrepreneur orientation, and entrepreneur readiness.

All living species exist within the constantly evolving ecosystems and need to follow Darwin’s law of “survival of the fittest”; while all enterprises operate in the extremely

unstable business environment and need to be highly adaptable in order to survive and grow (Yan, 2010; Liu, 2012). As Mintzberg (1999) noted, SMEs typically have a flat and centralized structure, with an organic and free-flowing management style that facilitates a high degree of flexibility and responsiveness. Hauser (2000) believed that this organizational characteristic leads to one of the SMEs' greatest strengths - their ability to swiftly adapt to any opportunities that arise in the evolving marketplace. However, everything is a double-edged sword. SME owner/managers have been accused of being "strategically myopic" (Mazzarol, 2004:1). As a result, SMEs tend to orientate towards short-term operational rather than long-term strategic issues, and decision-making tends to be reactive rather than proactive (Andriessen *et al.*, 1998; Stonehouse & Pemberton, 2002).

#### *2.2.2.2 Operational characteristics of SMEs*

The general consensus of opinion is that SMEs are struggling with limited resources (Wymer & Regan, 2005; Uden, 2007). When asked to name the most severe obstacle to growth, SMEs worldwide listed financing constraints as the first one, while large firms placed it only fourth (World Bank Group, 2010). Although SMEs are a major source of China's economic miracle, the financing predicament faced by them constitutes a great bottleneck for their development. According to a nationwide survey in 2008 (Jiang *et al.*, 2014), 85.6% of Chinese SMEs were facing a shortage of finance, and 14% were suffering from a severe liquidity crisis, among which 67%

were not capable of financing ongoing operations. The phenomenon of SME financing difficulties is caused by many reasons, such as China's imperfect financial system (Wang, 2004; Li, 2012), SMEs' incomplete corporate governance, loose management, and lack of transparency in accounting information (Duan *et al.*, 2009; Li, 2010).

In contemporary management, human resources are regarded as the most important asset of an organization because it manipulates all the other resources (Ominde, 1964; Akpan, 2011). At the beginning of 21<sup>st</sup> century, with the dizzying development of information and communication technologies (ICTs), human resources became the single element which the competitors could not copy (Ceranic & Popovic, 2008). In SMEs, owing to their small size, each individual has a greater influence on business performance than in larger corporations. Previous researchers have shown that unlike big companies, SMEs prefer to manage people in their own way - informally (Brand & Bax, 2002). Informality helps in developing a feeling of teamwork and strong social relationships and in increasing employee motivation (Marlow & Patton, 2002; Mayson & Barret, 2006). Nevertheless, because of limited opportunities for career progression, SMEs are mostly seen by some employees as a "stepping-stone" to move to larger organizations (Rasheed, 2004). In 2008, the average turnover rate of talent in SMEs in China was more than 50%, far higher than 15% which is a reasonable turnover rate. The departure of highly knowledgeable employees is a major threat to SMEs and could lead to their ultimate decline (Molnar *et al.*, 2011; Xu *et al.*, 2012).

By their nature, SMEs focus on allocation of limited resources to achieve maximum short-term benefits, which frequently leaves them to respond to external influences as they occur rather than taking a proactive approach (McAdam, 2002). Moreover, owing to their small size and limited resources, SMEs cannot compete in mass production and experience difficulties in achieving economies of scale (Okello-Obura & Matovu, 2011). Existing research seems to suggest that their flexibility allows SMEs to specialize in narrow niches that are unattractive or unfeasible for large companies to pursue due to the relatively small sales volumes and their high fixed costs (Andriessen *et al.*, 1998; Fink & Kraus, 2009). However, it is unrealistic and naive to assume that large companies will continue perpetually to ignore the market niches if they are seen to be profitable (Lim *et al.*, 1999). According to Nuez (2002), for the niching strategy to be sustainable, SMEs must possess some sustainable competitive advantages through their unique resources and capabilities that are difficult for the bigger firms to imitate.

### **2.3 Growth definition and motivation**

The research field on SME growth has drawn considerable attention from both government and scholars alike. However, no significant improvement has emerged owing to the inability to find a settled definition for a “growth firm”. (Cooney & Malinen, 2004; Foley & Green, 1989).

The growth of firms is an important indicator of a thriving economy, so it is one of the most analyzed fields in economics. In *The Wealth of Nations*, Adam Smith (1776) advanced the thesis that a firm's growth can only be achieved when economies of scale are realized through a high level of division of labor and specialization. Marshall (1949) has the same views as Smith and believed that a firm's efficiency is determined by an expansion in its size, enabling it to make use of the cost advantages of large scale production. Most economists put their efforts into the relation between growth and firm size (Audretsch *et al.*, 2004). As a result, according to Chen (2002), China's growth of SMEs is characterized by scale expansion. The majority of enterprises pay more attention on "quantity" growth of financial indicators such as assets and revenue growth. However, in order to achieve sustainable development, Wang and Liang (2011) proposed that SMEs should continually exploit, renew and enhance their core competencies, rather than be blindly obsessed with the scale of expansion.

Similarly, studies of firm growth are no longer in short supply in management literature. Penrose (1959:31) provided a new, dynamic conceptualization of the firm - "as an administrative organization and as a collection of resources" - designed to explain the firm level growth. Based on Penrose's theory, Wernerfelt (1984) developed the resource-based view (RBV) to address the fundamental question of why firms are different and how firms achieve and sustain competitive advantage by deploying their resources. He stated that a firm's growth can be sustainable as "its

resources are never completely utilized”. Many management academics argue that firms should not only be keen on “big”, but also focus on not ignoring the “strong” (Wang, 2007). There is a general consensus in management literature that in order to maintain growth in a changing environment, firms must “continually acquire, develop and upgrade” their “rare, valuable, and difficult to imitate or substitute” resources (Wernerfelt & Montgomery, 1988; Barney, 1991; Robins & Wiersema, 1995).

Hence, there is a difference between economic and management studies of firm growth. The former emphasizes the quantitative growth - the expansion in size, while the latter focuses on the improvement of quality - the optimized use of resources. Recognizing that one aspect alone cannot be called a real increase in the growth of enterprises, it is believed that the combination of “quantity” and “quality” growth helps to gain a wider perspective on measuring and comparing their performance (Li *et al.*, 2003; Wang, 2012) (see figure 4).

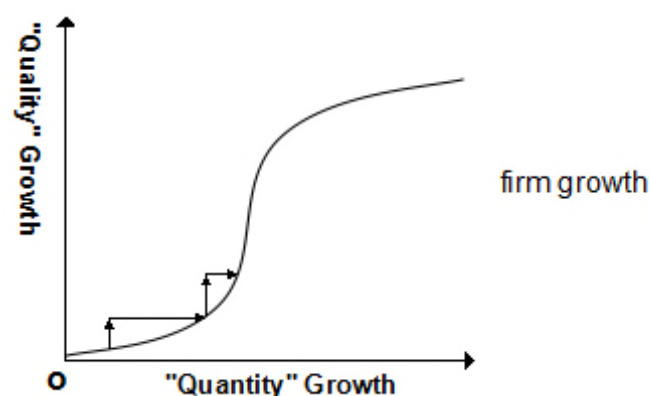


Figure 4: Growth theories of SMEs (Wang, 2012)

Storey *et al.* (1987) examined the motivations business people have for growth and suggested that it was either due to a desire to maximize profits, to increase personal income, to enjoy economies of scale, or to fulfill potential sales and asset possibilities. Nevertheless, growth is a rare outcome for SMEs.

Although most people want to be fit, look good and stay in shape, by far the majority do not possess these attributes. This is because they only have a weak desire, or a want, rather than a serious reason, or a need. The same principle applies to business. According to Bannier and Zahn (2012), not all SMEs are growth-oriented, and the majority of owner/managers focus on day to day survival. Several studies have revealed that entrepreneurs primarily motivated by “being your own boss” are less likely to pursue growth (Delmar *et al.*, 2003; Glancey, 1998; Muller, 2008). The rationale behind this is that they do not want to delegate key functions which lead to a loss of control in decision making. In Wang’s research (2008) devoted to the succession issues among Chinese family SMEs, in order to maintain control and pass down the business to the next generation, independence is the most important measure of success for owner/managers. Therefore, incorporating the intrinsic growth motivation of an entrepreneur is crucial in determining firm growth (Zhou, 2009).

#### **2.4 Determinants of SME growth in China**

It is commonly agreed that each enterprise is a complex system and its growth is



affected by a myriad of interacting external and internal factors (McMahon, 1995). The external environmental factors are those that are generally not in control of a firm but ultimately determine its opportunities and threats; and the internal environment consists of the strengths and weaknesses, including organizational goals and values, resources and capabilities, structures and systems (Beal, 2000; Analoui & Karami, 2003). However, most current published studies narrow their scope by only focusing on one or a few factors, and are criticized for the non-systematic and non-comprehensive analysis. As a result, although several determinants of firm growth have been suggested, researchers have been unable to achieve a consensus regarding the factors leading to it (Weinzimmer, 2000).

#### 2.4.1 External factors affecting the growth of SMEs in China

Based on the principals of bionics, all living species, including humans, arrive at their current biological form through an evolutionary process in response to drastic changes in their ecosystems. Similarly, SMEs operate within constantly evolving business ecosystems rather than a vacuum and need to be highly adaptable in order to survive and grow (Yan, 2010).

##### *2.4.1.1 Globalized environment*

In Wyndham's book (1984), the term "global village" was firstly introduced to

illustrate that today's world has shrunk into a small village. Over the past three decades, numerous studies have been devoted to the opportunities and threats/challenges for SMEs to survive and grow in an increasingly globalized world.

Dominant opportunities identified in the literature for SMEs emanating from the forces of globalization include: disappearance of trade barriers; access to new markets; possibilities to exploit economies of scale; possibilities for the absorption of excess production capacity or output; exposure to international best-practice; means of diversifying risks; and the optimality of market segmentation (Davenport and Bibby, 1999; Mundim *et al.*, 2000; Narula, 2004).

On the contrary, threats/challenges which are likely to face SMEs as a result of increased globalization may include: the high costs that SMEs face in terms of establishing and maintaining foreign distribution and marketing networks; inadequate protection of property rights; increased competition from imports; and global financial crisis (Acs *et al.*, 1997; Mundim *et al.*, 2000; OECD 2008).

#### *2.4.1.2 National environment*

PEST analysis stands for "Political, Economic, Social, and Technological analysis" and describes a framework of macro-environmental factors for enterprises used to scan the national environment (Chak, 1998) (see figure 5). A frequent excuse for

business failure is the actions of others: unfair laws and regulations, economic downturn, changes in customer tastes and preferences etc. Most of these cases, however, could only have been rescued if there was sufficient time given. Time is available only if entrepreneurs take heed of all the warnings in the air and act in advance. The PEST analysis is such an instrument, and a failed entrepreneur could have used to save his/her company (Khan, 2009).

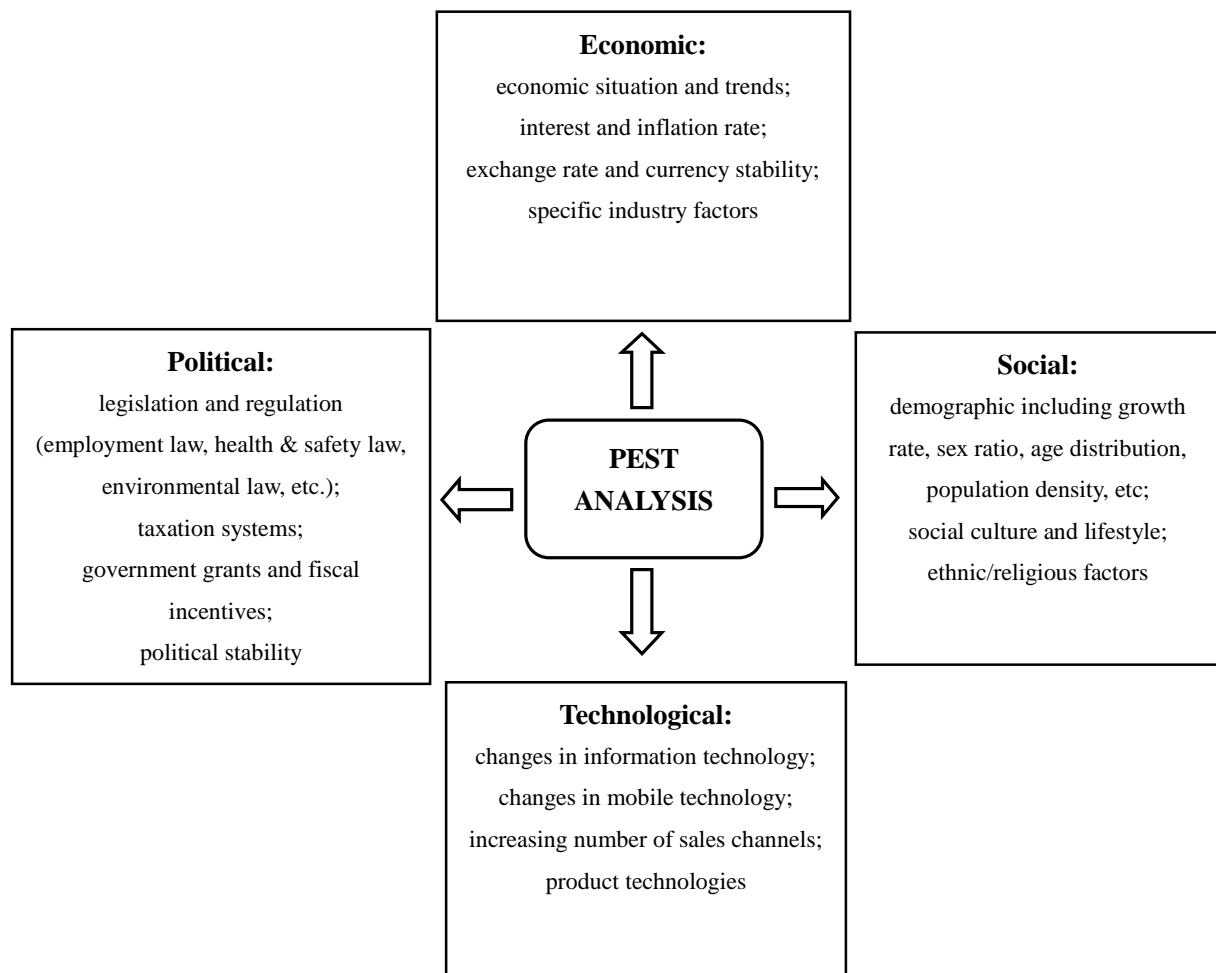


Figure 5: National environmental analysis (PEST) (Chak, 1998)

### 2.4.1.3 Industrial environment

The data published in “Fortune” in 2011 showed that the average life expectancy of Chinese SMEs was 2.9 years compared with 7 years for US SMEs and 40 years for large enterprises worldwide. According to Duan *et al.* (2009), Chinese SMEs operate in a chaotic, disorganized manner with short-term thinking and that often lead to their failure. An effective strategic plan must be built out of a sophisticated understanding of the structure of the industry and how it is changing (Bian, 2005). Porter’s five forces model (1985) - the bargaining power of buyers and suppliers, the threat of new entrants and substitute products or services, and the rivalry among existing competitors - is the most commonly used analytical tool for examining the industrial environment (see figure 6). The strength of the five competitive forces, which varies from industry to industry, determines long-term industry profitability, for they shape the costs companies have to bear, the prices they have to charge, and the investment required to compete in the industry.

At present, externally, China’s manufacturing industry occupies an important position in the world, second-largest manufacturing great-power, and account for 13.2% of that of the global value; internally, China’s manufacturing industry contributes 50.9% of GDP, 55% of total taxation revenue and provides 60% of employment (NBS, 2013). However, different from the U.S. manufacturing sector, where large companies play a dominant role, manufacturing SMEs are pervasive in China, accounting for 95% of

the total, whose competitive advantages derive from the abundance of cheap labor (PBC, 2011). By following, based on a holistic approach, Porter's five forces model has been adopted to analysis the Chinese traditional manufacturing sector.

Threat of new entrants: HIGH

According to Porter's theory (1979), there are mainly six barriers for new entrants, and the height of these barriers determine the profitability of the established firm above the competitive level in the long-term.

- Capital requirements: China became an ideal choice for MNCs deciding where to build new manufacturing plants because of its lower capital-investment requirements.
- Economies of scale: SMEs, owing to their small size and limited resources, cannot compete in mass production and experience difficulties in achieving economies of scale.
- Absolute cost advantages: Owing to an average annual 14% rise in wages and 10% rise in raw materials, China is losing its competitive edge as a world manufacturing base (Li, 2013).
- Product differentiation: Most Chinese manufactured goods are labor-intensive, low value added and easily substitutable.
- Access to channels of distribution: Chinese manufacturing enterprises have only

provided OEM products for the big buyers but have not yet established a position in the international market. By comparison, foreign companies, owing to their established brand image, are much easier to access to the channels of distribution in China.

- Governmental and legal barriers: Chinese accession to WTO means enterprises cannot rely on government protection and they will have to face an influx of foreign competitors.

Threat of substitute products: HIGH

Porter (1979) states that substitute product is a source of threat because it limits the price that company can charge and limits an industry's earnings and growth. Manufacturing sector in China is primarily a traditional, labor-intensive or resource-intensive industry, and do not possess sustainable competitive advantages. At present, owing to the impact of the financial crisis on global trade, countries are expected to protect their own economy, while most Chinese manufactured goods are low value-added and easily substitutable. As shown in figures of WTO, in the first half of 2013, China has reported a year-on-year decline of 3.1% in its exports (Zhao, 2013).

The bargaining power of buyers: HIGH

The bargaining power of buyers describes how strong the customers' attitude is. If buyers bargaining power is high enough, they can force the price down, or negotiate for higher quality of products (Porter, 1979). Owing to an average annual 14% rise in wages and 10% rise in raw materials, China's low cost comparative advantages are shrinking compared with many Southeast Asian countries (e.g. Malaysia, Indonesia), finally rising prices will be passed on to customers and reduce the attractiveness of Chinese-made goods (Li, 2013). Moreover, China's accession to WTO gives buyers greater access to foreign consumer goods. According to a nationwide survey, in the past decade, Chinese consumers' shopping habits have changed dramatically. They are becoming more imaginative and assertive in their demands, less price-sensitive and often value quality more than cost (Guo & Meng, 2008). As a result, the bargaining power of buyers in Chinese manufacturing sector is high.

The bargaining power of suppliers: HIGH

Firms are of dependent relationship to suppliers, and suppliers can exercise bargaining power by raising prices or reducing the quality of products (Porter, 1979). According to Li (2012), SMEs cannot produce and purchase economically because of their size and resource constraints, so always in a weak bargaining position. Moreover, manufacturing SMEs are pervasive in China in labor-intensive or resource-intensive industries. The access of labor and raw materials to reasonable prices is going to be a challenge for them in the future. Owing to the average annual 14% rise in wages and

10% rise in raw materials during the past decade, the profit margin for Chinese SMEs has been severely squeezed (1.5% compared with 26% for German SMEs) (NBS, 2013).

Rivalry among existing firms: INTENSIVE

If all the rivals strive to satisfy the same needs, the ultimately result will be the “zero-sum competition” which means one firm’s profit is another one’s loss (Porter, 1979). Manufacturing SMEs in China concentrated in labor-intensive or resource-intensive industry, most of which began to experience massive excess capacity since 2005. According to official estimates, China’s capacity utilization across all industries barely tops 70% (compared with a healthy 80% in the U.S.) (Pei, 2015). Chinese manufacturing SMEs, due to the lack of core competencies, can only compete on price in order to fight for market share. However, the price competition is destructive to the profitability. A nationwide survey reported that the average profit margin of Chinese SMEs was only 1.5%, 25% of them were operating at a loss while less than 30% were enjoying a comfortable profit margin of more than 5% (NBS, 2013).

Sum up: Chinese manufacturing is experiencing a tough time, and urgently need to transform and upgrade itself from labor-intensive and resource-intensive to technology-intensive and knowledge-intensive. During this process, a large number of



SMEs will disappear from the market, while only SMEs that can swiftly adapt and respond to any changes in the marketplace may become tomorrow's larger companies.

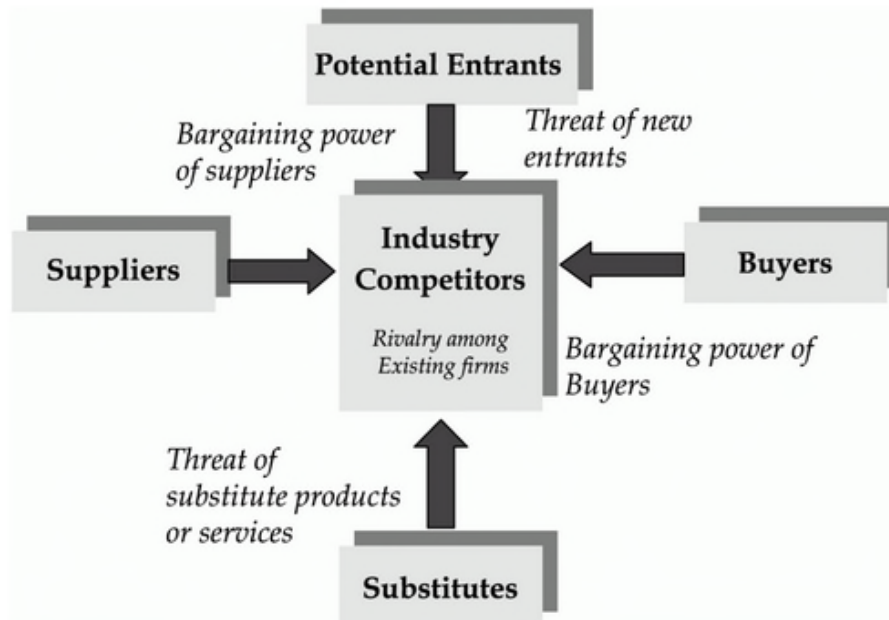


Figure 6: The five forces model by Michael Porter (Porter, 1985)

#### 2.4.2 Internal factors affecting the growth of SMEs in China

SMEs often have less control over key environmental elements than do their larger counterparts. Therefore in order to survive and grow, they must be especially vigilant, first in spotting opportunities and threats in external environment, and second in responding quickly through their internal management system (Susman *et al.*, 2006; Hauser, 2000).

#### *2.4.2.1 Ownership structure*

In China, 85.4% of SMEs are highly centralized family businesses, in which individuals or families own a controlling stake of more than 50% (Xi, 2011). According to Ning (2007), China's SMEs are full of patriarchal atmosphere and far away from the modern company culture. The need for development of the business generates the delegation process. Once a firm has reached a certain size, there is a need to professionalize the management function if a firm is to continue to grow. However, owing to the succession issues, a key internal constraint in the growth of Chinese SMEs is a reluctance or inability of owner/managers to diversify control over business functions to professional managers (Storey, 1994; Kortelainen, 2007).

#### *2.4.2.2 Entrepreneurial influences*

In a multitude of SMEs, it is not the top management teams but the entrepreneur himself who is the enterprise's main strategist and decision-maker, developing the vision, mission and strategies, and also implementing them (Analoui & Karami, 2003; Kraus & Kauranen, 2009). As a result, SMEs are normally managed in a relatively personalized way and the characteristics of the entrepreneur are widely accepted as vital ingredient that influences growth (Chak, 1998). According to the literature surveyed, the entrepreneurial characteristics can be categorized under psychological and non-psychological factors (Woldle *et al.*, 2008; Sirec & Mocnik, 2010; Soini &

Veseli, 2011) (see figure 7).

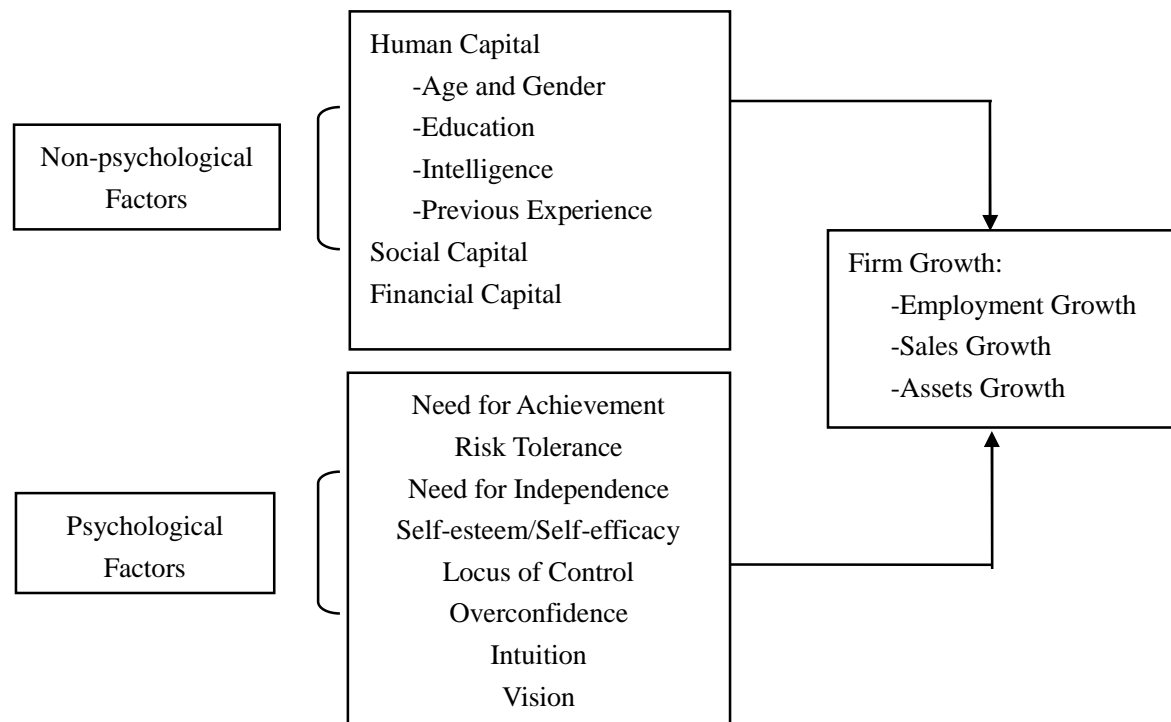


Figure 7: Entrepreneur’s personal characteristics (Sirec & Mocnik, 2010)

As one of the fastest growing economies in the world, Chinese culture has become an interesting topic. The model above was designed and utilized based on Western culture. However, in China, Confucianism is the base. “All Chinese are Confucianists, as all English are Saxons” (Smith, 1984: 295). Chinese business has, and continues to be deeply influenced by Confucianism. Both Geert Hofstede (1980) and Fons Trompenaars (1997) researched how people from different countries interact based on different categories of cultural dimensions. The figure below shows the huge cultural differences between China and UK by using the Hofstede’s model. As a result, business rules and norms in Chinese contexts differ greatly from Western world.

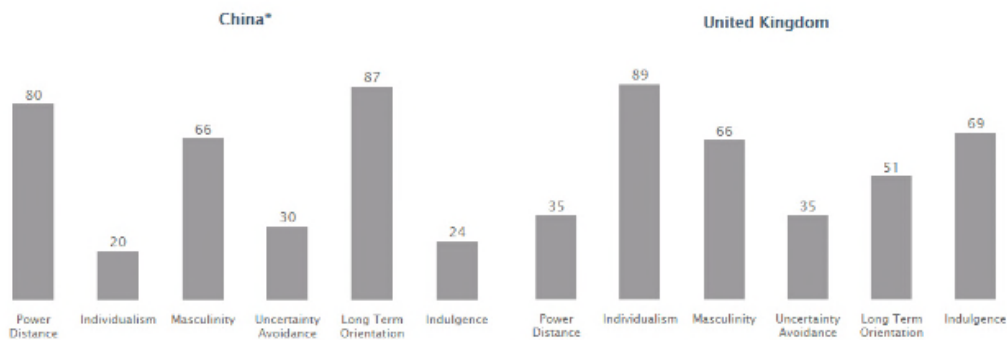


Figure 8: Cultural differences between China and UK

While in the other parts of the world, you may be able to clinch a deal just through formal business meetings; in China it is necessary to spend time and money getting to know your Chinese counterparts outside the boardroom during the tea sessions and dinner banquets. Guanxi is an important part of Chinese business culture, and is used for describing personal relationships between people. However, this simple translation can never fully explain the exact meaning of Guanxi in Chinese culture. According to Yang (2011), compared with networks, Guanxi has its unique features - personal, reciprocal and more long-term oriented.

Confucianism emphasizes the primacy of family. In China, 85.4% of SMEs are highly centralized family businesses, which are usually controlled by a dominant family head who has the final word on important decisions (Xi, 2011). In order to pass down the business to the next generation, independence is the most important measure of success for them. As a result, not all family businesses are growth-oriented (Wang, 2008).

Sum up: Entrepreneurial aptitude in China should be measured based on the Chinese cultural context.

#### *2.4.2.3 Firm specific resources*

Penrose's (1959) seminal work of growth theory using resource-based view suggested that a firm can be viewed as "a collection of productive resources"; and firms differ in fundamental ways as each has its own bundle of resources. In her book "*The Theory of the Growth of the Firm*", Penrose pointed out that competitive advantages and performance results are a consequence of firm-specific resources. According to Wiklund *et al.* (2009), businesses and organizations rely on two major resources: financial resources and human resources. However, in China, lack of financial resources and difficulties in employing and retaining high quality human resources place significant constraints on SME development (Mazzarol, 2004; Hussain *et al.*, 2009; Wang, 2012; Li, 2013).

#### *2.4.2.4 Organizational strategy, structure and culture*

Based on the principals of bionics, an enterprise is analogous to a human body, and should be considered as a live organism. Human need brains, bones and nerves to all work together in order to function properly. Similarly, enterprises need strategy

(brains), structure (bones), and culture (nerves). If you're missing any piece of the body, it all falls apart (Sylvia & Rajeev, 2014) (see figure 8). Based on previous research on SMEs, successful strategic planning and implementation are key for overcoming resource constraints and achieving sustainable competitive advantages; flexible organizational structure facilitates a high degree of adaptability and responsiveness in constant changing business environment; and strong organizational culture builds up higher morale among employees which contribute to elevated efficiency and heightened productivity (Zhang, 2006; Li, 2013; Mohammad *et al.*, 2013; Razieh *et al.*, 2013).

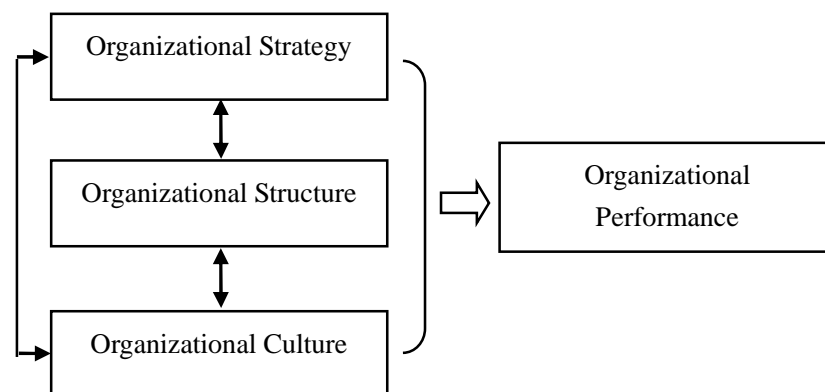


Figure 9: Effects of strategy, structure and culture on organizational performance

(Sylvia & Rajeev, 2014)

#### 2.4.2.5 Innovation capability

Innovation is broadly seen as an essential component of competitiveness, embedded in the organizational structures, processes, products, and services within a firm

(Vrande et al., 2008). According to Tiwari and Buse (2007), in spite of the resource constraints, SMEs seem to be better placed for innovations than their large counterparts due to the flexibility and agility they owned. Moreover, SMEs frequently operate in niches and have direct contact to customers thereby potentially gaining valuable impulses in the form of customer feedback. However, Chinese SMEs are mainly labor-intensive or resource-intensive and in lower end of global value chain, as a result, only less than 30% of them are enjoying a comfortable profit margin of more than 5% (China's NBS, 2013). In a highly uncertain business environment, without unique competencies, Chinese SMEs find it increasingly difficult to grow or even survive in their respective markets (Lin & Li, 2011; Li, 2013).

#### *2.4.2.6 ICT usage*

In the present knowledge-based economy, SMEs need to develop competitive advantages based on an adequate and intensive use of information and communication technologies (ICTs), which is an essential element of success in today's market (Virginia *et al.*, 2007). Specifically, SMEs can obtain a wide range of benefits from the use of ICT:

- Increase the speed and reliability of transactions for both business-to-business (B2B) and business-to-customer (B2C) transactions (Brady *et al.*, 2002).
- Exchange real-time information and build closer relationship with suppliers,

business partners and customers (Alam & Noor, 2009).

- Obtain, process and analyze information from both inside and outside business, and act proactively (Moreton & Chester, 1997).
- Improve the efficiency of internal business operations and increase productivity (Ongori, 2009).
- Enable the access to new market opportunities (Fulantelli & Allegra, 2003).
- Reduce the effects of employee turnover by enhancing and facilitating knowledge management (KM) with the adoption of ICT (Sulisworo, 2012).

## **2.5 Growth process of SMEs**

Biological analogies have been widely used in organizational analysis. Marshall's (1949) reference to the rise and fall of the trees in the forest is an oft-quoted example of the life-cycle analogy. Today, a number of published reviews were found in the literature which focus specifically on explanations of SME growth based on life-cycle stages through which growing businesses might typically pass (Farouk & Saleh, 2011). In the work of Steinmetz (1969), Greiner (1972), Scott and Bruce (1987), Adizes (1989) and McMahon (1998), stage models were adopted from the biology life-cycle analogy, assuming that the firm progresses through separate successive stages, including existence, growth, take off and maturity. Churchill and Lewis (1982) illustrated this life-cycle analogy as shown in figure 9.



However, stage models suppose that all firms grow through the same stages and in the same sequence, which make them less acceptable to many researchers. As Macpherson and Holt (2007) put it: “the growth process is significantly more challenging and complex than stage models portray.” Levie and Lichtenstein (2008) in particular believe that stage theory is “dead” and should not be used at all. In Hoff’s (2012) study, many SMEs do not pass through “stages”. They may jump back and forth, or may reach a stage and then cease to trade. Based on the heterogeneous character, each enterprise possesses different sizes and ages, goals and values, resources and capabilities, structures and strategies, so exhibit a unique growth process (Levy and Powell, 2004; Carrizosa, 2006). The stochastic theory is another one that denies the stage models. It assumes that there are too many factors affecting growth and that no specific factors have a dominant effect that can be used to explain growth. Accordingly, the growth of SMEs can be assumed to be perfectly random and cannot be predicted using any group of variables (Eraydin & Paci, 2003).

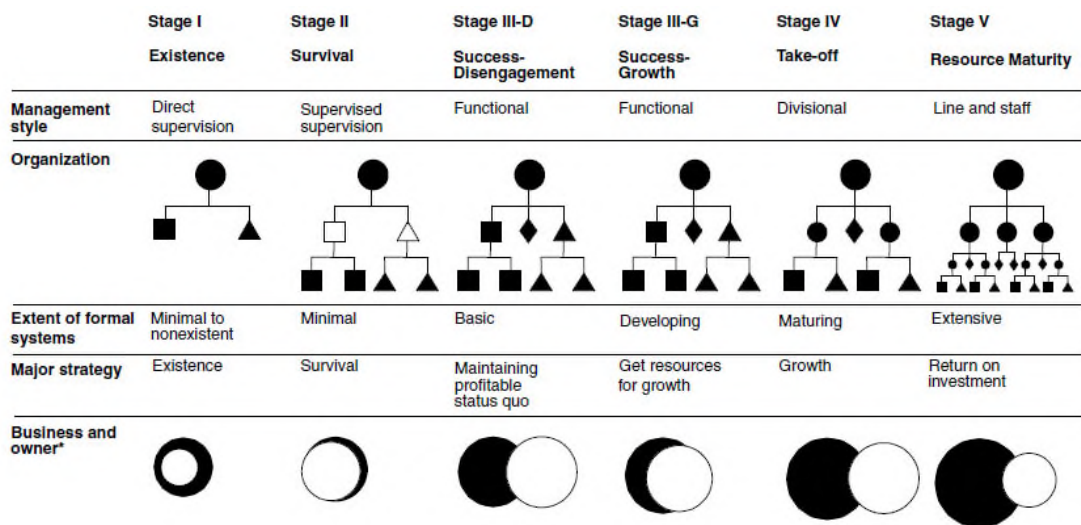


Figure 10: Characteristics of SMEs at each stage of development

(Churchill and Lewis, 1982)

## **2.6 Growth patterns of SMEs in China**

As one of the fastest growing economies in the world, China's business environment has been extensively investigated and analyzed (Wang, 2012). Overall, Chinese SMEs have gone through three development phases, along with the development of China's reform and opening-up (Chen, 2006). The first phase, from 1978 to 1992, was characterized by strong support from the government to establish collective and self-employed enterprises. The rapid expansion of these enterprises has made a great contribution to the China's soaring economy. The second phase, from 1992 to 2002, was characterized by the reform of state-owned SMEs and encouragement of non-public sectors. At the same time China defined its goal of instituting a socialist market economy. The third phase began in 2002 when China promulgated the SME promotion law, which symbolized the establishment of SMEs' unsubstitutable role to the national economic growth and social stability (Zhu, 2009; Cardoza & Fornes, 2012).

According to Ruzzier and Konecnik (2006), there is no uniform growth pattern and that each company should follow its own strategy, based on its availability of resources, competitive advantages and opportunities stemming from its environment.

As a result, SMEs in China display various growth patterns, and each has its own unique set of advantages and disadvantages (Wang, 2012).

### 2.6.1 Industry clusters

Porter (2000) defined clusters as “geographic concentrations of interconnected companies and associated institutions in a particular field that not only to compete but also to cooperate”. In China, the Cluster-Based City Economic Development (CCED) Approach provides a systematic methodology to understand the major drivers of local economic development (Choe & Roberts, 2011). Statistics show that in 2010, over 2,000 industry clusters of a considerable scale were formed along the eastern coastal area of China where regional advantages and characteristics were given play to guide SMEs to develop in specific clusters (Freisher *et al.*, 2010). Cluster development has now become the main direction for the development of SMEs in China. This essentially illustrates the concept of “one town, one product” as exemplified by the cable town in Guanlin, the silk town in Shengze and the shoes town in Wenzhou (NBS, 2011). “Forest economy” phenomenon was introduced by Zhang (2011) as an output of industry clusters whereby “big trees and small trees co-exist and thrive together”.

There is no doubt that globalization is a source of opportunity as well as a source of threat. Owing to their size limitations, SMEs need to create and maintain cooperative

relationships with other companies and related partner institutions to achieve synergy (Zeinalnezhad et al., 2011). Under these circumstances, many countries have promoted the development of industry clusters where SMEs can gain competitive advantages against the world's best competitors by sharing resources, innovative capabilities, and knowledge (UNIDO, 2010). According to Omta (2004) and Tambunan (2009), industry clusters can be both horizontal and vertical in dimension. Specifically, horizontal clusters relate to collaborative networks among firms occupying the same position in the value chain, while vertical clusters refer to collaborative partnerships among all players along the linear, upstream-downstream value chain. A number of researchers have acknowledged the value of clusters in overcoming SMEs' constraints as well as enhancing their competitive position. For example, cluster members are able to take advantage of economies of scale and reducing transaction costs (Huang & Fan, 2005; Tambunan, 2009; Niu, 2010), and benefit from high levels of specialization (Zeinalnezhad *et al.*, 2011). Proximity helps to establish cooperative linkages between cluster members through enhancing mutual learning and knowledge creation (Karaev *et al.*, 2007; Carpinetti *et al.*, 2008). Moreover, clusters enhance the reputation of a location in a particular field and therefore have access to a larger network of customers and greater financial resources (Birkinshaw, 2000; Adersson *et al.*, 2012).

However, many developing country clusters have recently been judged to be under-performing, and various studies try to address the barriers/challenges that limit

their development and growth (UNIDO, 2005). First, in a constantly changing business environment, SMEs in industry clusters are increasingly relying on larger firms for their access to markets, and become more vulnerable if they are locked in old technologies and if they do not develop enough flexibility to adapt themselves to those changes (OECD, 2004; Zeng, 2008; Krywulak & Kukushkin, 2009; Wang, 2012). Second, efficient business networks are at the core of successful clusters. However, owing to the issues such as “lack of trust”, “loss of control”, “exposure of know-how” and “allocation of profits”, difficulties are often encountered in forming structured and durable forms of collaboration between cluster members (Bruner & Spekman, 1998; Parker, 2000; Fawcett *et al.*, 2012).

### **Case study: Wenzhou Footwear Cluster**

Wenzhou is located in the south-eastern part of Zhejiang province and used to be one of the poorest regions in China. With limited arable land, poor road access to major cities, and little support from the government, it seemed to lack all the necessary conditions for economic growth (Zhang & Li, 1990). However, over the past two decades, Wenzhou has become one of the fastest-growing cities and developed the most dynamic SME sector in China. The footwear industry cluster that began in the late 1970s is a major source of Wenzhou’s economic miracle (Huang *et al.*, 2007). Statistics show that the footwear output in Wenzhou increased from 500 thousand pairs in 1978 to 835 million pairs in 2004, which accounted for more than 51% of

global shoe production (Cai, 2005) (see figure 10).

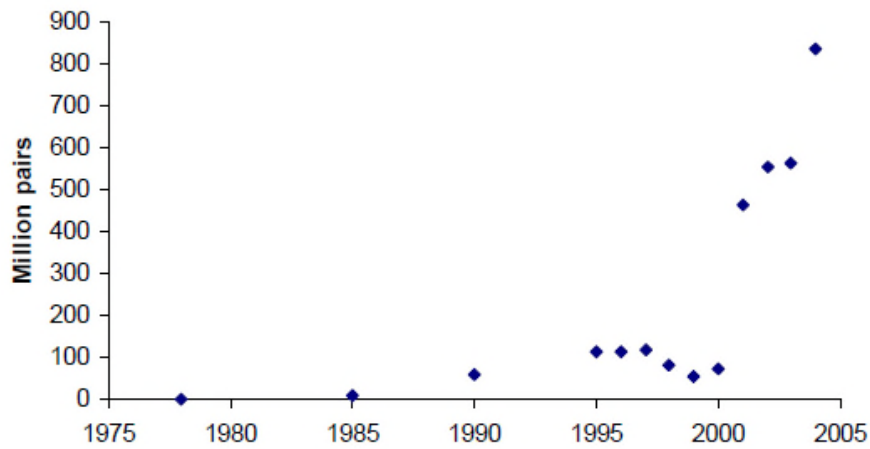


Figure 11: Footwear output in Wenzhou 1978-2004 (Cai, 2005)

Owing to its successful cluster-based strategy, Wenzhou has been named the world's most influential footwear production center, sale center and information center (Zhu, 2005). As shown in figure 11, a so-called "China's footwear capital" has gradually emerged in Wenzhou since the late 1970s. By 2007, the industry cluster consisted of over 4000 shoe-making enterprises, 200 leather enterprises, 380 footwear sole enterprises, 200 footwear machine enterprises, 168 footwear last enterprises, and 50 footwear design and drawing offices, in addition to training schools and research institutions (Huang *et al.*, 2007; Ruan & Zhang, 2009). These clustered companies (99% are SMEs) and associated institutions are able to achieve synergies which will maintain their competitive advantages and facilitate their entry into Global Value Chains (GVCs) (OECD, 2004).

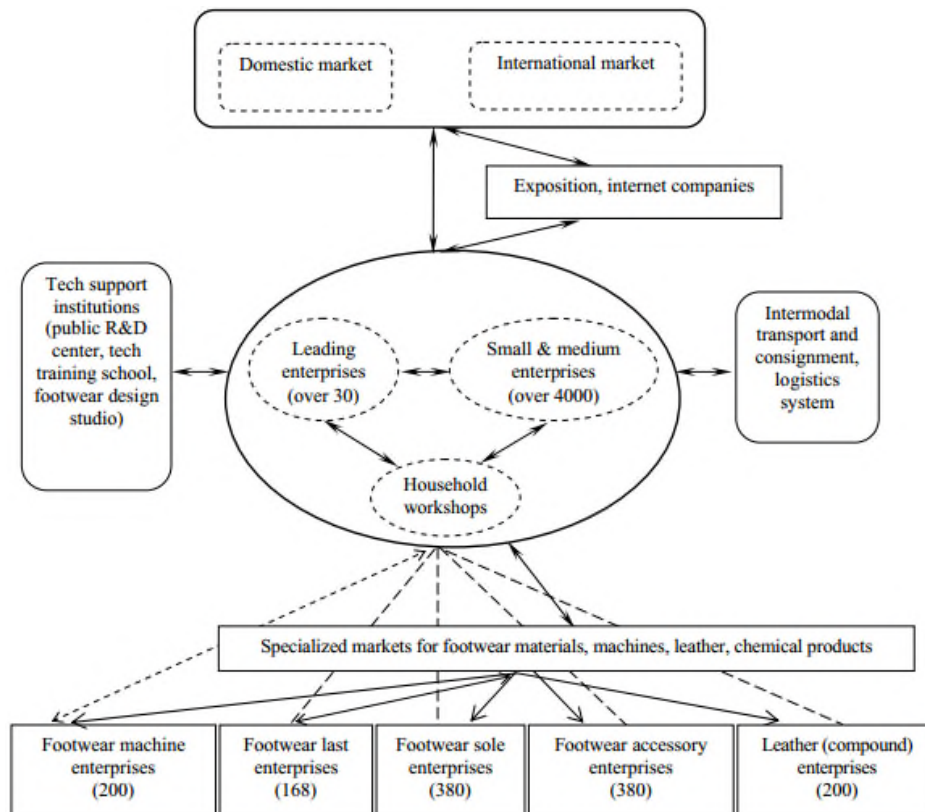


Figure 12: The structure of the Wenzhou footwear cluster (Huang *et al.*, 2007)

### 2.6.2 Internationalization

The term “global village” was firstly introduced by Wyndham (1984) to illustrate that today’s world has shrunk into a small village. Over the last couple of decades, with the development in logistics and ICTs, the “end of geography” phenomenon has been witnessed by both policy-makers and business practitioners (de la Torre & Moxon, 2001). The internationalization of business has continued apace, but is no longer dominated by large multinationals emanating from the world’s leading developed markets; the newly industrializing countries (NICs) have spawned a number of global

players, and SMEs have begun to take on a more significant role in the international business arena (Lenihan, Andreosso & Hart, 2010). In China, although there are still many uncertainties and barriers in the process of internationalization, such as global financial crisis, institutional environment, resource and management constraints, SMEs are increasingly forced to “think and act internationally” so as to adapt to the trend of China’s accession to World Trade Organization (WTO) (Cardoza *et al.*, 2011; Gao, 2011; He, 2011).

According to Lis *et al.* (2012), a major risk of trade liberalization is the entry of international players into domestic markets constituting additional competition in largely saturated markets. As a result, for SMEs in the most attractive countries for Foreign Direct Investment (FDI) (e.g., China), internationalizing activities is not just an opportunity but a must in order to grow or even just survive (Forze & Kalinic, 2005). Moreover, spreading activities across different countries makes SMEs more resistant to the impact of rapidly changing and unpredictable business environment (BIS, 2010; AEB, 2011). Dunning (1993) introduced a model of internationalization motives including four different categories: resource seeking, market seeking, efficiency seeking and strategic capability seeking. Most published research findings show that internationally active SMEs perform better than purely domestic firms (OECD, 2004; Love & Roper, 2013).

However, although internationalization may be necessary for SMEs to grow in the



long run, it does not guarantee a firm's survival (Onkelinx & Sleuwaegen, 2008). There is little doubt that the costs and uncertainties involved in the internationalization process are substantial, and not all entrepreneurs are willing or able to take this risk (Anja *et al.*, 2009). Julien (1995) described the SME's internationalization journey as "a fish that has become bigger and bigger in its pond and will be eaten when it reaches the sea". Although many barriers have reduced or have been removed in an increasingly globalized world, SMEs are still confronted with numerous obstacles when deploying activities in foreign markets. Past research identified lack of resources (OECD, 2009; Gunaratne, 2009), lack of knowledge of local markets (Suarez-Ortega, 2003), lack of technical skills (Chau & Pederson, 2000), lack of management skills (OECD, 2009; Wang, 2012), and lack of home government assistance (Djebarni & Khalil, 2009; Cardoza *et al.*, 2011), as the top impediments to SME internationalization.

### **Case study: Zhejiang Kasen Group**

Established in 1989, Zhejiang Kasen Group is one of the world's leading upholstered furniture manufacturers, with customers located in more than 30 countries worldwide. It follows the Uppsala model (see figure 12) where the firm starts from no international activity and goes on to engage in some international activity and then

ends up owning subsidiaries abroad (Masum & Fernandez, 2008). Specifically, Kasen Group focused solely on its domestic market (China) before 1998. In a globalized world, local SMEs are increasingly forced to think and act internationally, because the entry of international players into domestic markets causing additional competition in largely saturated markets (Lis *et al.*, 2012). As a result, Kasen Group started to provide OEM manufacturing for two Australian reputable furniture brands (Sleeping city and Everyday living) from 1999. By OEM production, the company learned from world advanced enterprises in R&D capabilities and management capabilities. However, hampered by the 2008 global financial crisis, Sleeping city and Everyday living were broken in their capital chains, and then Kasen Group decided to acquire their retail outlets in Australia. Analyzing statistically, the profit margin of being an OEM contractor is just about 1.1% while being a company which owns the whole retail outlets is more than 15%. By 2012, Kasen Group owned 155 retail stores and its market share climbed to be ranked No.3 in Australia. Owing to its successful internationalization strategy, compared with most of China's furniture manufacturers hovering in the bottom of Global Value Chains (GVCs), Kasen Group is more positioned to achieve sustainable growth in the rapidly changing and unpredictable business environment (Kasen Group, 2014).

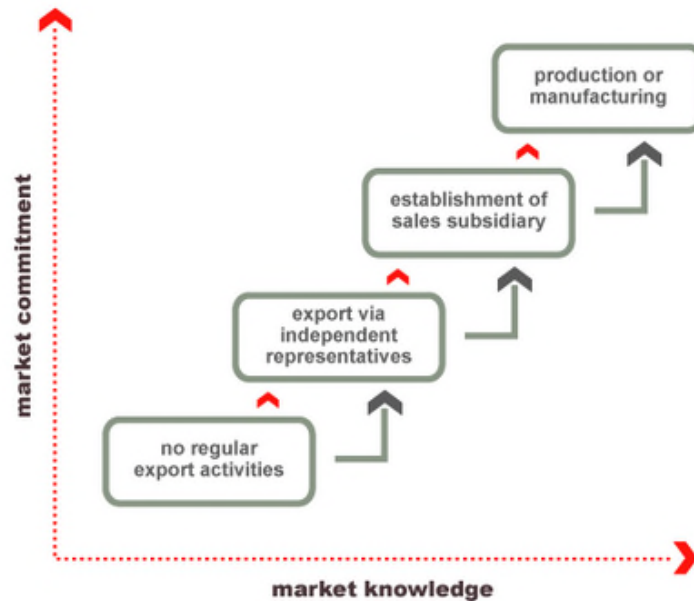


Figure 13: The Uppsala internationalization model (Johanson & Vahlne, 1977)

### 2.6.3 Merges and acquisitions (M&A)

The term merges and acquisitions (M&A) is a catch-all phrase for the purchase, sale, and combination of companies (Rosenbaum & Pearl, 2013). It is an important business phenomenon, as evidenced by the large and increasing volume of M&A activities over the years (Yu, 2013). According to figures from PwC (2014), the number of announced M&A transactions in China in the first half of 2014 has been more than 2000 deals with a total value of US\$183 billion. Although much research attention has been given to the top M&A events (e.g., American Airlines/US Airways, Lenovo/IBM PC), compared to large firms, SMEs are more likely to rely on M&A as an external growth option (Cooke, 2013). Research from the China Association of Small and Medium Enterprises (CASME, 2014) shows that in a survey of 500 SME

owner/managers, one in ten are actively considering M&A deals in the next few years.

Synergy is the additional value that is generated by combining two firms, creating opportunities that would not been available to these firms operating independently; and is the magic ingredient that encourages them to invest large amounts of time, money, and organizational focus in M&A deals (Damodaran, 2005). Specifically, because resources (knowledge and intellectual property, people, finance, etc.) and market powers (distribution channel, market share, brand image, etc.) are consolidated, M&A allows companies to access new markets or industries speedily (Kruh, 2012; Gee, 2014). M&A also allows to enhance technical strength (Akao, 2012), to maintain a strong consumer focus (Thomas *et al.*, 2012), to achieve economies of scale by horizontal integration and to gain control of the complete value chain by vertical integration (Gaughan, 2002; Chen & Findlay, 2003; Zhou & Zhang, 2010).

However, regardless of how compelling M&As are, there will be inevitable, immediate challenges and risks that surface involving companies (Chong & Callender, 2010). Numerous empirical studies show high failure rates of M&A transactions (Straub, 2007). A McKinsey survey (2010) of 200 M&A deals conducted in 2009 revealed that nearly 50% received disappointing feedback compared with results expected. In literature, poor culture-fit or lack of cultural compatibility have become much cited reasons for M&A failure (Cartwright & Schoenberg, 2006). Others include: flawed intentions (Finkelstein & Cooper, 2010), insufficient planning (Weber,

2012), poor implementation (Chong & Callender, 2010), and uncontrollable external forces (Saat & Himmelsbach, 2014).

### Case study: Shuanghui - Smithfield

On May 29, 2013, the board of Smithfield Foods, Inc. announced an agreement to sell the entire company to Chinese meat processor Shuanghui International Holdings Ltd. for US\$4.7 billion. With the burgeoning middle class, annual meat consumption in China has gone from being a third of that of the U.S. in 1978, to now more than double that according to statistics from the Earth Policy Institute (2014) (see figure 13). To meet rising domestic demand, China has imported around 400,000 tons of pork annually in recent years (China Daily, 2013).

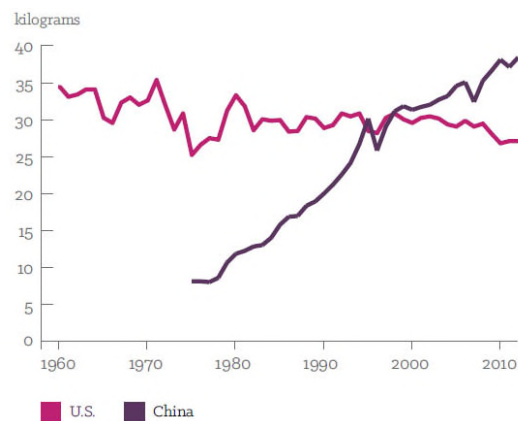


Figure 14: Pork consumption per person in China and U.S. (Earth Policy Institute, 2014)

“This strategic combination, which has been unanimously approved by the boards of directors of both companies, will create a world’s leading vertically integrated pork enterprise,” said Shuanghui chairman Wan Long. Shuanghui is a pioneer in the

Chinese meat processing industry with over 30 years of history. The acquisition provides Smithfield the opportunity to expand its offering of products to China through Shuanghui's distribution network. Meanwhile, Shuanghui will gain access to overseas pork resources, and also benefit from advanced technologies and operational practices to strictly adhere to the highest quality and safety standards (Shuanghui, 2014).

#### 2.6.4 Collaborative approach

In the present knowledge-based economy, individual firms cannot be good at everything, so must specialize and learn to combine their capabilities with those of other firms and organizations (European Commission, 2007). As a result, collaboration is not just some over-hyped buzzword, but an essential part of business life (Fleishch & Alt, 2001). Casals's study (2010) provides evidence that both internal factors (limited resources, managerial constraints, etc.) and external factors (uncertain economic climate, globalization of markets, etc.) force SMEs to search for collaborative approaches to survive. Collaboration literally means working-together and can take many forms such as strategic alliances, joint ventures, licensing, outsourcing and collective research. Each type poses a different set of trade-offs in terms of speed, cost, control, potential for leveraging existing competencies, developing new competencies and accessing another firm's competencies (Jordan & Michel, 2000; Noor & Mulyaningrum, 2014).

The literature on collaboration suggests that implementation of collaborative initiatives has inherent difficulties, therefore the amount of effort involved in integrating operational, tactical or strategic levels of separate companies is usually large (Bititci *et al.*, 2004; Parker, 2000). Collaborations may be weakened or even come to an end without fruitful and desired results due to various barriers/challenges which include: the people issues - such as cultural conflict, resistance to change, lack of managerial competence, fear of losing control; and the organization issues - such as misalignment of goals and objectives, resource constraints, confidentiality of information, multi-criteria performance measurement (Bruner & Spekman, 1998; Kelly *et al.*, 2002; Fawcett *et al.*, 2008).

However, in their book “*Managing to Collaborate*” researchers Chris Huxham and Siv Vangen (2005) from the University of Strathclyde in Scotland state that “if collaboration could be done without too much pain then benefits could be enormous.” Some motives and drivers associated with inter-enterprise collaboration have been identified as: to increase market share (Lewis, 1990), to increase asset utilization (Bititci *et al.*, 2004), to share risks and reduce costs (McLaren *et al.*, 2000), to enhance skill and knowledge (Holton, 2001), to reduce lead time and order fulfillment time (McCarthy & Golicic, 2002), to gain rapid access to markets (Parker, 2000).

#### **Case study: J&W trading company**

J&W is a trading company in China and export car components to Middle East and European countries. It actually works as a middle man. Specifically, J&W takes big volume orders from automotive manufacturing companies and spare-part dealers, then passes these orders to different local factories and gets them done according to the clients' specifications. Then, in order to ensure adequate, efficient and effective delivery, J&W has outsourced all of its logistics operations to a Third-Party Logistics (3PL) - T-Join Transportation Co.Ltd (see figure 14). During the whole process, owing to scarce resources, J&W is specializing and concentrating in its certain core capabilities - marketing & sales, at the same time outsourcing the provision of non-core activities (J&W, 2010).

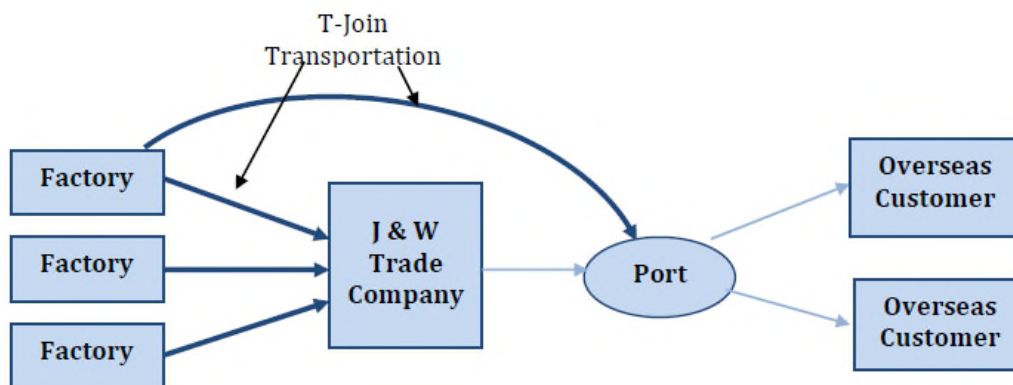


Figure 15: Logistics operation of J&W (J&W, 2010)

### 2.6.5 Niching strategy

“Though a firm can have a myriad of strengths and weaknesses compared with its



competitors, there are two basic types of competitive advantage it can possess: low cost or differentiation” (Porter, 1985). However, various studies have revealed that SMEs due to their characteristics have difficulty to pursue competitive advantages in direct competition with their bigger foes (Lim *et al.*, 1999; Gautam & Singh, 2009). As a result, niching is probably often the most regularly advocated strategy for SMEs, suggests that they should focus on market segments that are less crowded or even overlooked by their large counterparts (Weinstein, 1994; Bruns, 2007). On the whole, for SMEs to survive and grow in today’s business environment, they have to continuously create and capture blue oceans - uncontested market spaces where the competition is irrelevant, and “swim out of the bloody red oceans filled with sharks” (Kim and Mauborgne; 2004; Eboreime & Gbandi, 2014).

“If there is no niche, there is no hope for SME survival and prosperity” (Zoepfel, 2011). According to Ghemawat (1991), in the face of fierce competition, SMEs are clearly at a disadvantage, so should focus on unmet market gaps ignored by the bigger firms. A comprehensive list of reasons for targeting niches have been summarized by Pandit and Chari (2009) as follows: achieve strategic fit, optimize the use of resources, obtain first-mover advantages in having greater consumer awareness and acceptance. Research shows that most of high-growth SMEs develop and serve small segments, rather than pursuing the whole mass market (European Enterprise Center, 1994; Krywulak & Kukushkin, 2009).

However, it would be unrealistic and naive to assume that large firms would do nothing but let SMEs profit from the market niches (Lim *et al.*, 1999). According to Dalgic (2006), large firms who have initially neglected the niches may try to appropriate the niches from SMEs, especially if SMEs have successfully developed the market into a size that is sufficiently big and profitable. Polaroid's experience serves as a timely reminder to all SMEs. Polaroid had the patent to its instant photography technology, but that did not stop Kodak from taking over the instant photography market once the patent expired (Rowbotham, 2013). Hence, in order to survive and grow in a constantly changing environment, SMEs must possess sustainable competitive advantages that are difficult to imitate or copy (Kraja & Osmani, 2013).

### **Case study: BangBangTang Animal House**

In the present knowledge-based economy, the days when entrepreneurs could hit and run seem to be passing. The new competition requires sustained investment in core-competencies-based strongholds that can be defended and strengthened (Cooper *et al.*, 2006). As a result, SMEs due to their characteristics (e.g., size limitations, resource constraints) should segment markets to identify target consumers with similar values, lifestyles, experiences, needs, and so on (Cooper *et al.*, 2006). BangBangTang Animal House, a small firm in China, only offers the highest level of mobile pet grooming services for target pet owners aged 45-65. Analyzing statistically,

the spending on pet services has increased dramatically over the past decade in China; and it is important to note that the pet owners aged 45-65 had the highest expenditure per year, with an average of \$630.5 in 2011 (see figure 15 and 16). Therefore, niching strategy allows the company to obtain a competitive advantage over its larger counterparts by offering customer-oriented products and services.

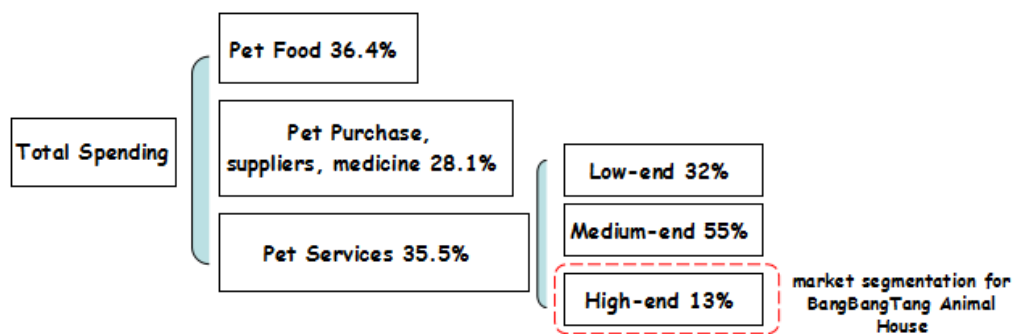


Figure 16: Annual expenditures on pets in China

(BangBangTang Animal House, 2012)

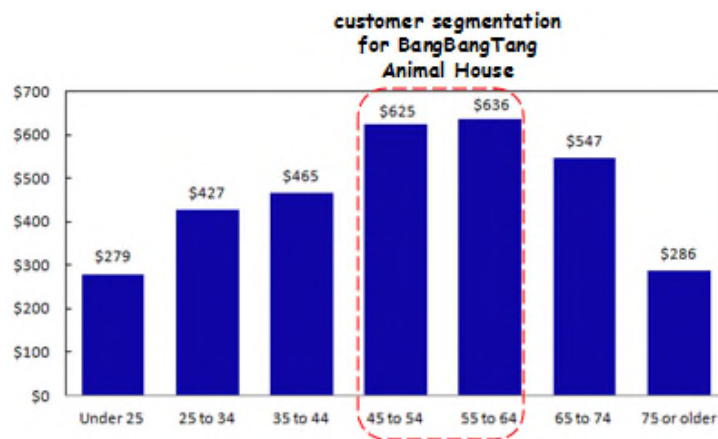


Figure 17: Annual expenditures on pets by age of reference person in China

(BangBangTang Animal House, 2012)

## 2.6.6 Diversification

The rapidly changing and unpredictable environment has forced SMEs to become

stronger, more resilient and better prepared to manage whatever challenges the future holds. A successful instrument is to engage in product or market diversification (Coleman, 2013). Product diversification means the supply of new products to the existing market, whereas market diversification represents the opportunity to sell existing products to new markets (Ansoff, 1968; Virtanen, 2007). An obvious example of diversification is provided by the proverb “don’t put all your eggs in one basket”. It is about managing risk/return trade-off by selecting a mix of investments that will work to achieve financial goals (Kenny, 2009). Although diversification is a highly controversial growth strategy and has even been referred to as “suicidal behavior” (Campbell *et al.*, 2012), a report from the Economist Intelligence Unit (EIU, 2013) has revealed that almost 63% of SMEs in the UK have adopted it (diversification) to cope with shorter product life cycles and economic instability.

Diversification is a strategic approach adopting different forms (Cunningham & Harney, 2012). Should the business “stick to its knitting” (known as related diversification), or should it enter totally new competitive arenas (known as unrelated diversification)?

**Related Diversification:** occurs when a company develops beyond its present product and market whilst remaining in the same arena.

- Backward diversification occurs when a company extends its scope of activities into the originating (inputs) point of the industry value chain.

- Forward diversification occurs when a company extends its scope of activities into the end (outputs) point of the industry value chain.
- Horizontal diversification occurs when a company develops its scope of activities into areas that are in competition with, or directly complementary to, its current activities.

**Unrelated Diversification:** occurs when a company expands its operation into unrelated product or market.

As illustrated in figure 17, since the early work of Rumelt (1974, 1982), various studies have revealed that related-diversified SMEs usually attain higher performance than specialized companies or companies pursuing unrelated diversification (Palich *et al.*, 2000; Joongkyoung & Sangmoon, 2013). According to Hill (1994), by implementing a strategy of related diversification, firms can focus on core organizational capabilities and also exploit the interrelationships between business lines to achieve lower production, distribution and selling costs, stronger brand image and company reputation.

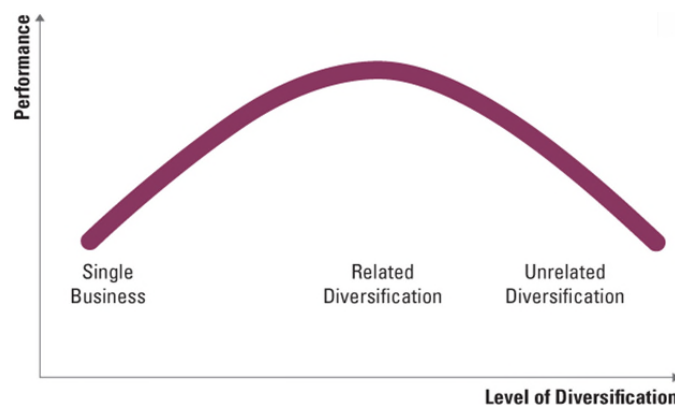


Figure 18: The diversification-performance relationship (Palich *et al.*, 2000)

However, the distinctive particularities of SMEs - for example, limited resources and lack of managerial capabilities - obviously constrain diversification as an alternative for firm growth (Singh, 2009; Fernando & Maria, 2011). Instead, owing to the heterogeneity among SMEs (each enterprise possesses different sizes and ages, goals and values, resources and capabilities, structures and strategies), existing research seems to suggest that specialization in a market niche can not only compensate for size disadvantages but also gain and maintain competitive advantages (Lim et al., 1999; OECD, 2000). Bill Gates, Warren Buffett, and Michael Dell, the world's most successful investors, believe that diversification is only required when people do not understand what they are doing (Sander, 2013). According to Vail (2013), diversification does not drive but waters down returns because of inappropriate resource allocation.

### **Case study: Metersbonwe**

Known for its high-energy style and low-range prices, 19-year-old Metersbonwe is now among China's largest casual clothing retailers. Metersbonwe is a vertically integrated apparel chain in the fashion industry that works differently from traditional retailers. Generally, a traditional retailer outsources all of its production while

focusing on distributing and retailing those goods. However, instead of relying on outside partners, Metersbonwe manages and controls over nearly every piece of the supply chain, from design to retail (see figure 18). It has been able to achieve sustainable growth due to its (backward and forward) related diversification that provides the chain with a competitive advantage over traditional retailers in the industry:

- Metersbonwe's in-house production creates a rapid product turnover since inventories are strictly controlled.
- Metersbonwe's vertically integrated supply chain helps to optimize (upstream and downstream) information flows.
- Metersbonwe's highly responsive supply chain enables to react quickly to changing needs. Metersbonwe needs just three weeks to develop a new product and get it to stores, compared with a six-month industry average.
- Metersbonwe's centralized supply chain allows to improve cost and quality control, avoid misunderstandings and conflicts . (Metersbonwe, 2014)

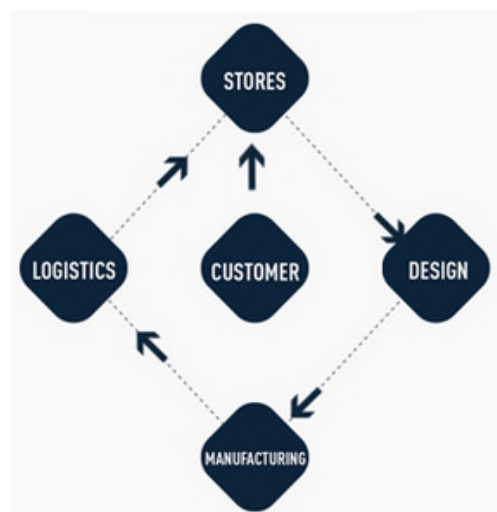


Figure 19: Metersbonwe vertically integrated supply chain (Metersbonwe, 2014)

### 2.6.7 Cross-channel cooperation - online to offline (O2O) business model

Advances in technology and changes in consumer behavior implicate the ongoing integration of online and offline business activities (Kollmann & Hasel, 2006). As shown in figure 19, O2O is an emerging business model that attracting customers online and directing them to offline physical stores (Du & Tang, 2014). The explosive growth of internet users in China (642 million in 2014) create an environment for O2O to flourish. According official statistics, China's O2O market reached US\$15.8 billion in 2012, representing a growth of 75.5% from US\$9 billion in 2011, and is expected to quadruple to over US\$67 billion by 2015 (Xing, 2014).

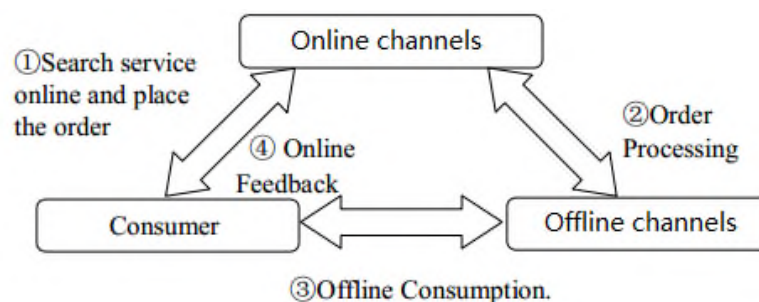


Figure 20: Operation flow of O2O commerce mode (Du & Tang, 2014)

According to Hsieh (2013), O2O is essentially to gain more profit for a company by improving operational efficiency and customer satisfaction through an integrated online/offline business strategy. Specifically, O2O offers business multi-pronged



benefits. It allows any small physical business to gain exposure online rather than relying solely on offline advertising methods (Du & Tang, 2014). It also allows customers to enjoy highly personalized shopping experiences (Shen & Wang, 2014). Moreover, compared to traditional business, the O2O companies can maximize customer interactions (Xia & Zhu, 2014), and also benefit from reduced processing times and transaction costs (Robert & Zahay, 2013).

However, O2O is also characterized by some technological and non-technological limitations:

- Security is one of the principal and continuing concerns that restrict customers and organizations engaging with O2O business model (Niranjanamurthy & Dharmendra, 2013).
- According to this study 48% of customers abandon the confusing online checkout process. This is akin to nearly half of customers getting into a brick-and-mortar store's checkout line and then walking away before getting to cash register (Voloper Creations, 2008).
- People prefer to shop in the conventional way for specific products (e.g., food and clothing) that need to be felt and touched before making the purchase (Voloper Creations, 2008).
- Many companies find it too expensive and complicated to integrate online and offline channels successfully (Shen & Wang, 2014).

## Case study: China's O2O market

According to official statistics (CINIC, 2014), by the end of 2013, China has had 618 million internet users, among which 83.4% were mobile internet users; online shoppers has exceeded 302 million, a year-on-year increase of 24.7%; and the number of users of online payment has reached 260 million, a growth of 17.9% over the previous year (see figure 20, 21, 22). The internet development in China has transformed from “increase of penetration” to “deepened degree of usage”.

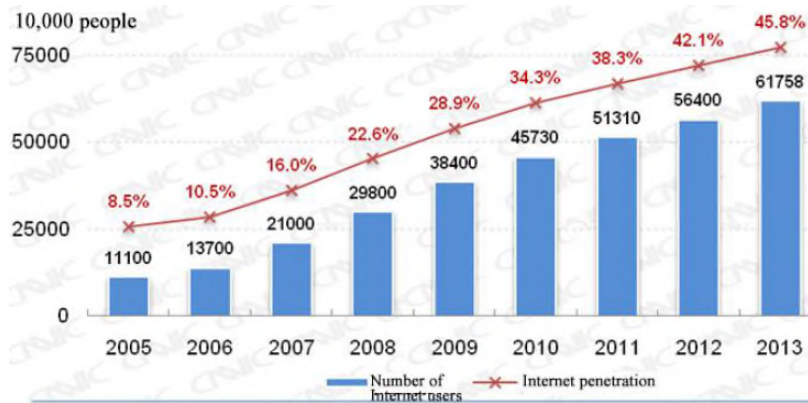


Figure 21: Size of internet users in China and internet penetration (CINIC, 2014)

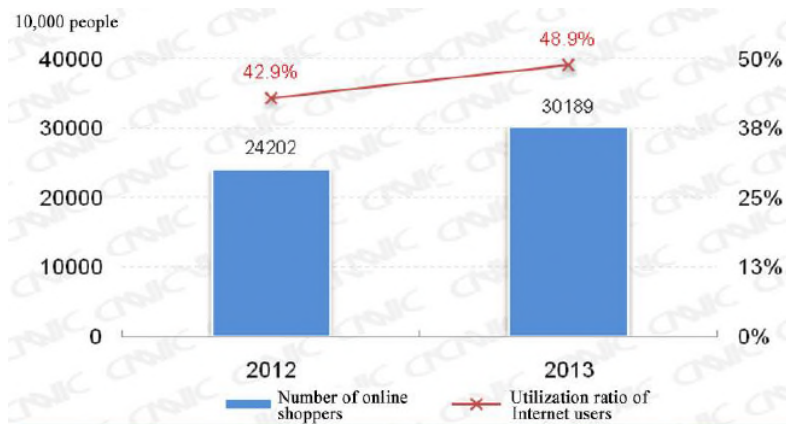


Figure 22: Number of online shoppers and utilization ratio (CINIC, 2014)

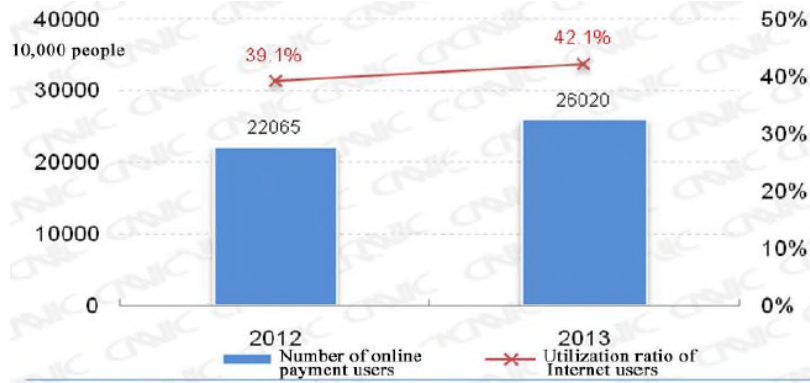


Figure 23: Number of online payment users and utilization ratio (CINIC, 2014)

It is believed that the internet environment in China will bring traditional business into a new era of O2O commerce. China's O2O market reached US\$15.8 billion in 2012, representing a growth of 75.5% from US\$9 billion in 2011, and is expected to quadruple to over US\$67 billion by 2015 (Xing, 2014). In order to seize this emerging opportunity, a large amount of local service-oriented O2O platforms emerged in the past few years (iResearch, 2013), such as:

- 1) E-commerce platforms: Taobao, JD, Yiwugou, etc.
- 2) Group buying platforms: Meituan, Lashou, etc.
- 3) Travel booking platforms: Ctrip, Donkey Mama, etc.
- 4) Taxi booking platforms: Didi Dache, Kuaidi Dache, etc.
- 5) Food ordering platforms: Eleme, Daojia, etc.
- 6) Car rental platforms: Shenzhou, ZuCheZu, etc.
- 7) Social communication platforms: WeChat, Weibo, Momo, etc.
- 8) Online review platforms: Dianping, Koupei, etc.

9) Online payment platforms: Alipay, China UnionPay, etc.

Today, more and more companies are implementing O2O strategy to reach potential customers through enhancing brand awareness and reputation, and to cultivate long-term relationships with existing customers to generate repeat business (Lee, 2009). For example, 7 Days Inn uses WeChat to send notifications to its 1.35 million members about special offers and discounts. The company now receives around 5000 reservations from WeChat (70% are second-time customers), accounting for 22% of its total bookings everyday (7 Days Inn, 2014).

#### 2.6.8 Summary

As shown in Table 2 below, each pattern illustrated in Section 2.6 has its own unique set of advantages and disadvantages. According to Ruzzier and Konecnick (2006), each SME should follow its own pattern based on its availability of resources, competitive advantages and opportunities stemming from its environment.

<i>Growth Pattern</i>	<i>Benefits</i>	<i>Barriers &amp; Challenges</i>
1) Industry clusters - Horizontal - Vertical	Share resources, innovative capabilities, and knowledge; take advantage from economies of scale and reducing transaction costs; benefit from high levels of specialization; cluster brand awareness.	Over-rely on local resources; unstable relationships between cluster members due to lack of trust, loss of control, exposure of know-how, and allocation of profits.
2) Internationalization	Resource seeking, market seeking; efficiency seeking, and strategic capability seeking.	Huge risks and uncertainties due to lack of resources, lack of knowledge of local markets, lack of technical skills, lack of management skills, and lack of home government assistance.

3) Merges and acquisitions (M&A)	Synergy effects: resources (knowledge and intellectual property, people, finance, etc.) and market powers (distribution channel, market share, brand image, etc.) are consolidated.	High failure rates (50%) due to poor culture-fit, insufficient planning, poor implementation, flawed intentions, and uncontrolled external forces.
4) Collaborative approach - Strategic alliance - Joint venture - Licensing - Outsourcing - Collective research	Optimize asset utilization; gain access to markets; increase market share; reduce costs; reduce lead time and order fulfillment time; share risks.	People issues such as cultural conflict, resistance to change, lack of managerial competence, fear of losing control; organizational issues such as misalignment of goals, resource constraints, confidentiality of information, multi-criteria performance measurement.
5) Niching Strategy	Achieve strategic fit; optimize the use of resources; obtain first-mover advantages in having greater consumer awareness and acceptance.	Large firms who have initially neglected the niches may try to wrestle the niches away from SMEs.
6) Diversification - Related diversification - Unrelated diversification	Diversify risks; cope with shorter product life cycles and economic instability; exploit interrelationships between business lines.	Limited resources and lack of managerial capabilities; water down returns.
7) Cross-channel cooperation - Online to Offline (O2O) business model	Gain exposure online rather than relying solely on offline advertising methods; reduce processing times and transaction costs; create personalized shopping experiences.	Security issues; confusing checkout process; prefer to shop in the conventional way for specific products that need to be felt and touched before making the purchase; expensive and complicated to integrate online and offline channels successfully.

Table 2: Pros & Cons of different growth patterns of SMEs in China

## 2.7 Comparison between different performance measures

Throughout history, there has been significant interest in performance measurement.

In general, business performance is defined as “the operational ability to satisfy the desires of the company’s major shareholders” (Smith & Reece, 1999). Well-rehearsed adages such as “what gets measured gets done” and “you get what you measure” suggest that implementing an appropriate performance measurement system will

ensure that actions are aligned to strategies and objectives (Lynch & Cross, 1991; Kennerley & Neely, 2002). When researching the different aspects of SME growth, it is first necessary to define how a firm's performance is measured. However, there is no universally accepted way to do that and scholars use various performance indicators when researching the field (Barkham *et al.*, 1996; Grimsholm & Poblete, 2010). As shown in Table 3 below, each indicator has its own unique set of advantages and disadvantages (the final column of the table shows the % of SMEs that applied the indicator for measuring their performance in Shahbaz *et al.*'s study (2014)).

<i>Performance Indicator</i>	<i>Advantages</i>	<i>Disadvantages</i>	<i>%</i>
1) Sales/ Revenue	applied to all the businesses; easy to identify and compute (Barkham et al., 1996)	does not only reflect the value-added of a company but also input prices; may have products that take several years to develop and subsequently sell (Storey & Greene, 2010)	22
2) Profit	applied to all the businesses; ultimate goal of all the businesses (Fitzsimmons <i>et al.</i> , 2005)	may choose to trade-off long term growth for short term profitability; easy to control and manipulate; past performance is no guarantee of future results (Fitzsimmons <i>et al.</i> , 2005)	25
3) Financial ratio	applied to all the businesses; allow easy comparison (Nohria <i>et al.</i> , 2003)	subjective selection; may be sensitive to industrial differences; cannot tell you a complete story; past performance is no guarantee of future results (Birley & Westhead, 1990; Perry, 2001)	20
4) Asset	all the businesses use assets to generate sales and profits (Coad & Holzl, 2010)	may be problematic for the firms in industries where intangible assets are important (Coad & Holzl, 2010)	6
5) Employment	applied to all the businesses; most valuable asset; easy to measure (Fraser <i>et al.</i> , 2006)	may vary widely across industries; is affected by labor productivity increases, machine-for-man substitution, and make-or-buy decisions (Delmar <i>et al.</i> , 2003; Fitzsimmons <i>et al.</i> , 2005)	18
6) Market share	less dependent upon macro-environmental variables; information available from secondary data-sets (Chen <i>et al.</i> , 2006)	does not allow for cross-sectoral comparisons; low market share firms can also be very profitable; Difficult to calculate for small businesses (Woo & Cooper, 1982; Grimsholm & Poblete, 2010)	4
7) Multidimensional	more accurate because it is unlikely that one measure will fully capture the performance of the business (Simons, 2000; Jamil & Mohamed, 2011)	any index has to decide on weights and it is not clear what these should be (Wang, 2012)	5

Table 3: Pros & Cons of different performance indicators

By the start of the twentieth century the nature of organizations had evolved,

ownership and management were increasingly separated. As a result, financial measures such as profits, revenues, return on investment (ROI) were usually applied by owners in order to monitor the performance of managers (Johnson, 1983; Bruns, 1998). Since that time assessment of performance has predominantly been based on financial criteria due to its objectivity, simply-to-calculate, and easy-to-use (Chong, 2008). However, by the 1980s there was a growing realization that the traditional finance-based measures were no longer sufficient to manage organizations competing in modern markets (Johnson & Kaplan, 1987). Many researchers suggest that financial measures are historical in nature and provide little indication of future performance (Dixon et al., 1990; Forgang, 2001); encourage short-termism (Sliwka, 2002); are internally rather than externally focused, with little regard for competitors and customers (Salloum & Wiktorsson, 2009); lack a strategic focus and often inhibit innovation (Misra, 2008).

In the increasingly fast-paced and dynamic business environment, companies cannot gain sustainable competitive advantage only by deploying in tangible assets, but also have to mobilize and exploit intangible assets that are measured by non-financial criteria (Marriot, 2008). According to Kaplan and Norton (2000), the use of non-financial measures is essential for strategy formulation and implementation as they contain forward-looking information about performance that is absent in financial measures. Empirical studies by Ittner & Larcker (1998), and Banker *et al.* (2000) both support the role of non-financial measures as a leading indicator of future



financial performance. However, researchers have also highlighted potential drawbacks associated with their use. First, non-financial measures such as product quality and customer satisfaction are difficult to be quantified accurately and efficiently, thus making comparison impossible (Chow & Stede, 2006; Morariu, 2011). Second, self-serving managers are able to choose and manipulate non-financial measures solely for the purpose for making themselves look good and earn nice bonuses (Luis *et al.*, 2010; Stede *et al.*, 2006).

Hence, recognizing the limitations of relying solely on either the financial (lagging) or non-financial (leading) measures (see table 4), it is believed that the combination of these two measures helps the owner/managers to gain a wider perspective on measuring and comparing their performance, in particular the extent of effectiveness and efficiency in utilizing the resources, competitiveness and readiness to face the growing external pressures (Hofmann, 2001; Chong, 2008; Zuriekat *et al.*, 2011).

<i>Performance Measures</i>	<i>Advantages</i>	<i>Disadvantages</i>
<b>Financial measures</b> Sales/Revenue Profit Financial Ratio ...	objectivity; simply-to-calculate; easy-to-use.	too backward looking; too inward looking; short-termism; lack a strategic focus; inhibit innovation; data may be inaccessible, inaccurate, incomplete and out of date.
<b>Non-financial measures</b> Employment Customer Satisfaction ...	essential for strategy formulation and implementation; are positively related to future financial performance.	hard to quantify; difficult to compare; subjective.

Table 4: Pros & Cons of financial and non-financial performance measures

## 2.8 Summary of Chapter 2

There is an old adage on Wall Street - “Past performance is no guarantee of future results.” In this respect, compared with traditional measurement approaches that do not completely capture future performance, the predictive system, based on a holistic approach which incorporates multiple measures, allows users (entrepreneurs, government, investors and financiers) to gain a better understanding of Chinese SMEs’ growth potential (see figure 23).

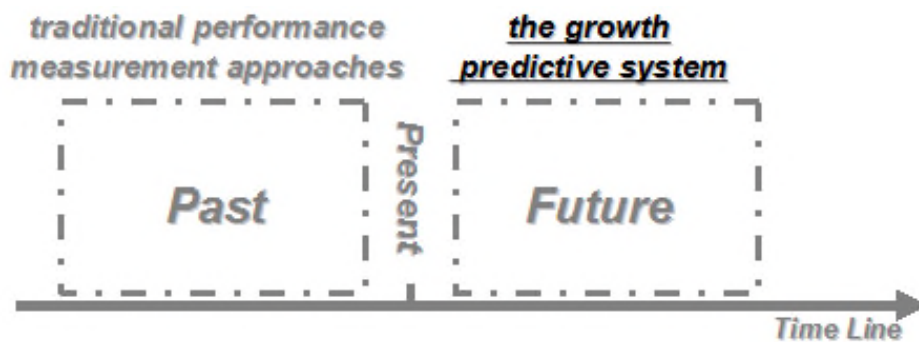


Figure 24: Research significance

In order to fulfill the objective of this paper, a comprehensive and systematic literature review was conducted to address the following questions (see table 5):

SME	What is the definition of SMEs in China?
	What are the characteristics of Chinese SMEs?
SME Growth	How to define “growth”?
	What is the growth motivation for SMEs?
	What are the growth determinants of SMEs?
	What is the growth process in SMEs?
	What are the SME growth patterns?
	What are the key performance indicators for SMEs?

Table 5: Framework for organizing literature review

### 3 METHODOLOGY

Research methodology has a central role in any kind of management research if the research is to be credible and of a high quality. The purpose of this chapter is to develop a deeper understanding of the wide range of methodological choices available to researchers, and conclude with the chosen one adopted for the thesis. One approach is no better than another, unless applied in a certain context in which one methodology is more suited to help fulfill the particular research objective (Saunders *et al.*, 2007). As shown in the “Research Pyramid” (see figure 24), it is composed of four action levels and can be seen as a logical chain of interconnected events ranging from rather abstract (on the philosophy level) to very concrete (on the technique level). Moving from top to bottom through this pyramid leads to an elaboration of the research objective based on clear-cut arguments leading to specific choices (Jonker & Pennink, 2010).

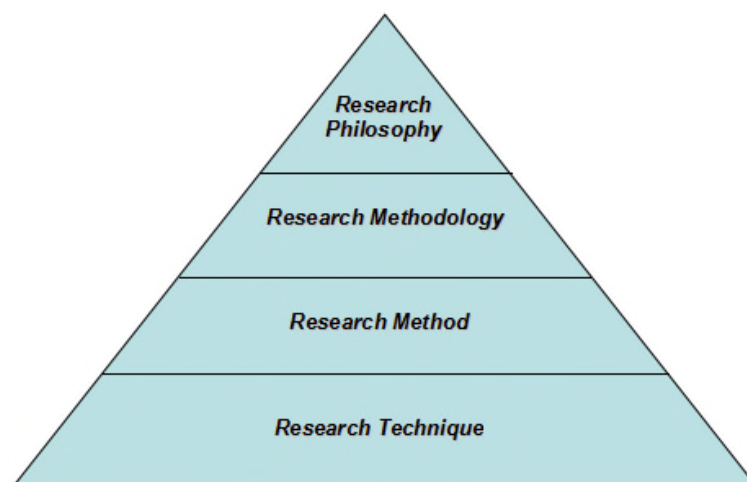


Figure 25: The research pyramid (Jonker & Pennink, 2010)

### **3.1 Research philosophy**

Management research deals with social world issues and generally those issues involve human interaction and therefore are messy (Ates, 2008). The research philosophy people adopt contains important assumptions about the way in which they view the world. These assumptions will have significant impact on how research should be conducted (Saunders *et al.*, 2007). In this discussion we examine two major ways of thinking about research philosophy: ontology and epistemology.

#### **3.1.1 Ontology**

Ontology is related to “the nature of truth in the world”, can be subjective or objective and thus explained as “assumptions that we make the nature of reality” (Easterby-Smith *et al.*, 2004). Subjectivism assumes that social phenomena are created through the perceptions and consequent actions of social actors. In other words, ones’ mind is ones’ world so reality is all imagination. The contrasting objectivism asserts that social entities exist in reality, make up of hard tangible and relative immutable structures, independent of the cognitive efforts of individuals (Morgan & Smircich, 1980) (see figure 25).



that the world is ordered and can be studied objectively. However, positivists in any case often faced great difficulty in operationalizing the variables in their theories; any mismatch between phenomena and data naturally weakens the ability of evidence to test theory. Therefore in practice it is difficult to follow a pure version of positivism while conducting management research (Szostak, 2004).

## **2) Interpretivism**

Interpretivism is an epistemology that advocates that it is necessary for the researcher to understand differences between humans in our role as social actors. This emphasizes the difference between conducting research among people rather than objects such as trucks and computers (Saunders *et al.*, 2007). In other words, interpretivists assume that there is no objective knowledge which is independent of thinking, reasoning humans (Gephart, 1999). Hence, there are no “correct” or “incorrect” theories and the interpretive studies attempt to understand the phenomena through which people attribute the meaning to them (Orlikowski & Baroudi, 1991; Walsham, 1995). According to Dowdy (2005) and Charumbira (2013), interpretivism is highly appropriate in management research because business situations are continuously evolving and have become unique and complex. However, Denzin (1983) argues that “interpretivists reject generalization as a goal”.

### 3) Critical realism

The philosophical debate around pure positivism and pure interpretivism is very distinctive, however, in practice to follow those pure paradigms are not always possible in management research (Ates, 2008). For example, positivism allows the researcher to discover whether two or more phenomena are linked consistently, but does not explain why the link exists; interpretivism allows the researcher to understand causal mechanisms, but is restricted to a single case making it impossible to generalize findings (Lin, 1998). As a result, critical realism seeks a middle way between positivism and interpretivism (Easterby-Smith *et al.*, 2004). It maintains the existence of an objectively knowable reality, while acknowledging that perception and cognition mediate human comprehension of that reality (Bhaskar, 1997).

Critical realism assumes that all methods have limits and emphasizes the application of triangulation strategy in order to improve understanding and enhance credibility of the study (Creswell, 2003; Rousseau *et al.*, 2008). Triangulation is broadly defined by Denzin (1978) as “the combination of methodologies in the study of the same phenomenon”. Taken into considerations that both methods in qualitative and quantitative paradigms have strengths and weaknesses, a combination is widely advocated by critical realists (see figure 26). Ideally, the priority would be equal between two methods, but in practice applications priority may be given to either the qualitative or the quantitative phase (Creswell, 2003).



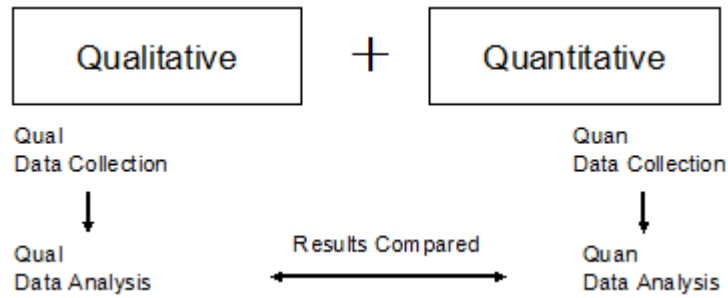


Figure 27: Triangulation Strategy (Creswell, 2003)

### 3.2 Research methodology

Anyone who wants to travel from Paris to Rome can choose to go on foot, by horse, by train, by plane or just take the car. A methodology indicates the main path to the destination and is “a way to conduct the research that is tailored to the research philosophy” (Easterby-Smith *et al.*, 2004; Jonker & Pennink, 2010). There are two major alternatives: inductive and deductive approaches. Inductive method is a bottom up approach, starts with the observations and theories are formulated towards the end of the research and as a result of observations. In other words, it is about collecting data and seeing what patterns or meaning can be extracted (Goddard & Melville, 2004). Deductive method essentially reverses the process found in inductive research and is a top down approach. The literature review and knowledge gathered from other sources allows for a theory to be developed, and from the theory a hypothesis may be constructed which can, in turn, be tested. The use of deductive method is underpinned by the need to specify theoretical propositions before the commencement of data

collection and its analysis ((David & Sutton, 2004; Saunders *et al.*, 2007) (see figure 27).

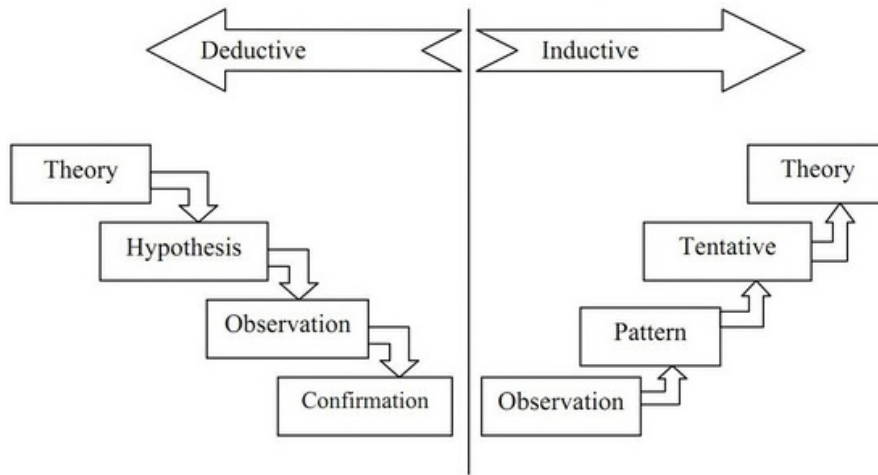


Figure 28: Deductive versus inductive (Jonker & Pennink, 2010)

### 3.3 Research method

Research methodologies are the main path to the destination but without specifying the individual steps, while research methods indicate specific steps (or actions, phases, step-wise approaches, etc.) that need to be executed in a certain (stringent) order during the research (Jonker & Pennink, 2010). In view of Myers and Avison (2002) a research method is a design or strategy for data collection. It is obviously impossible to analyze data before it is available, so prior to the data analyze you will need to consider the best way to collect the data (e.g. what, where, when, and how the data will be gathered). There are different methods available for management researchers, and no one is inherently superior or inferior to any other. What is most important is

not the label that is attached to particular method, but whether it will enable researchers to fulfill their unique research objective (Saunders *et al.*, 2007).

### 1) Action research

Action research has been traditionally defined as an approach to research which is based on a collaborative relationship between researchers and stakeholders which aims at both solving a problem and generating new knowledge (Saunders *et al.*, 2007). In action research, researchers are participants and can be referred to as “insider researchers” who are part of the situation they are investigating, while other forms of social research use “outsider researchers” who observe rather than act to change social practice (Dahlberg & McCaig, 2010). Action research is an iterative process which accumulates understanding gradually (see figure 28), but criticized for lacking objectivity, validity and generalizability (Auer & Follack, 2002; Brydon-Miller *et al.*, 2003).

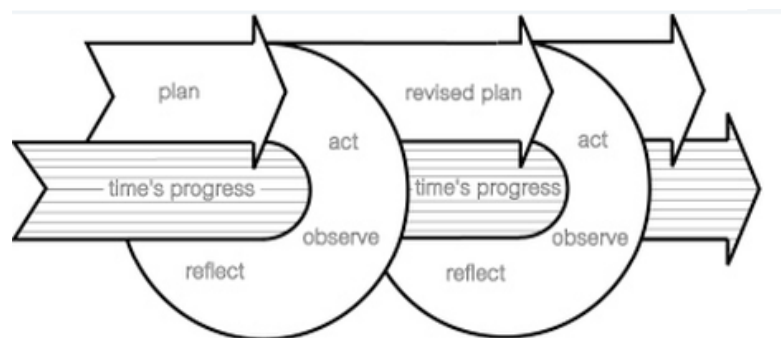


Figure 29: Action research cycle (Auer & Follack, 2002)

## **2) Survey research**

Survey research involves the collection of information from a sample of individuals through their responses to questions, and can be divided into two broad categories: questionnaires and interviews (Burton, 2007). First, because attitudes and opinions can be elicited only by questioning either directly or through well designed questions, survey owing to its versatility is very popular in management research (Krishnaswamy *et al.*, 2006). Second, survey is efficient in that many variables can be measured without substantially increasing the time and cost (Engel & Schutt, 2013). Third, survey is very appealing when sample generalizability is a central research goal (Chambliss & Schutt, 2012). However, according to Groves (2004), errors may occur at any stage in the survey process. In this context “errors” refer to deviations of obtained results from those that are true reflections of the population.

## **3) Experimental research**

Experimental research is defined as “observation under controlled conditions”, and is generally the most powerful method to establish the causal relationship between independent and dependent variables (Saunders *et al.*, 2007). For example, there is a hypothesis in psychology that fear will cause a person to want to affiliate with other people. In one experiment, two groups were established and members assigned at random to each. The experimental group was told that they would be getting

extremely painful electric shock, while the control group was told that the shock they would receive would be like a soft touch. Both groups were asked if they preferred waiting along or with others who were also going to be shocked. All members were interviewed by the same experimenter in the same room. A much higher percentage of the experimental group members asked to wait with others, and thus the hypothesis has been supported by the researchers (Rosen, 2005). However, experimental method is always more difficult in management field, because it attempts to manipulate independent variables to observe behavior of the dependent variables, which is not possible to be achieved by most management researchers (Collis & Hussey, 2009).

#### **4) Grounded theory**

Grounded theory is a systematic method for developing inductive theories based on the gathered and analyzed data (Bitsch, 2005). Compared with traditional methods which usually rely on a literature review leading to the formation of a hypothesis, grounded theory investigates the actualities in the real world with an open mind without preconceived ideas (Glaser & Strauss, 1967). In a grounded theory study, by restricting the literature, there is a reduced likelihood that the data will be manipulated to support existing findings (Ng & Hase, 2008). Lapan *et al.* (2012) summarized two main benefits of using the method. First, grounded theories are typically ecologically valid because they are “close” to the data from which they were generated. Second, because grounded theories are not tied to any preexisting theories or ideas, they are

often fresh and new and hold the potential for innovative discoveries. However, Schreiber & Stern (2001) suggested that “plunging into a research field without delving into the relevant literature would be folly”. Indeed, no one would claim to enter the field completely free from the influence of previous experience and reading.

## **5) Case study**

Case study is “a method for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence” (Robson, 2002). It has considerable ability to provide answers to “How?” and “Why?” questions, and can be used to generate, describe or test theory (Feagin *et al.*, 1991; Saunders *et al.*, 2007). Yin (2003:82) distinguishes between four case study methods based upon two discrete dimensions (see figure 29):

- single case vs. multiple case: a single case is often used where it represents a critical case or, alternatively, an extreme or unique case, whereas the rationale for using multiple cases focuses upon the need to generalize findings.
- holistic case vs. embedded case: a holistic case study tries to draw conclusions about the phenomenon as a whole, whereas an embedded case study draws conclusions about the phenomenon by investigating or analyzing sub-units of the study object.

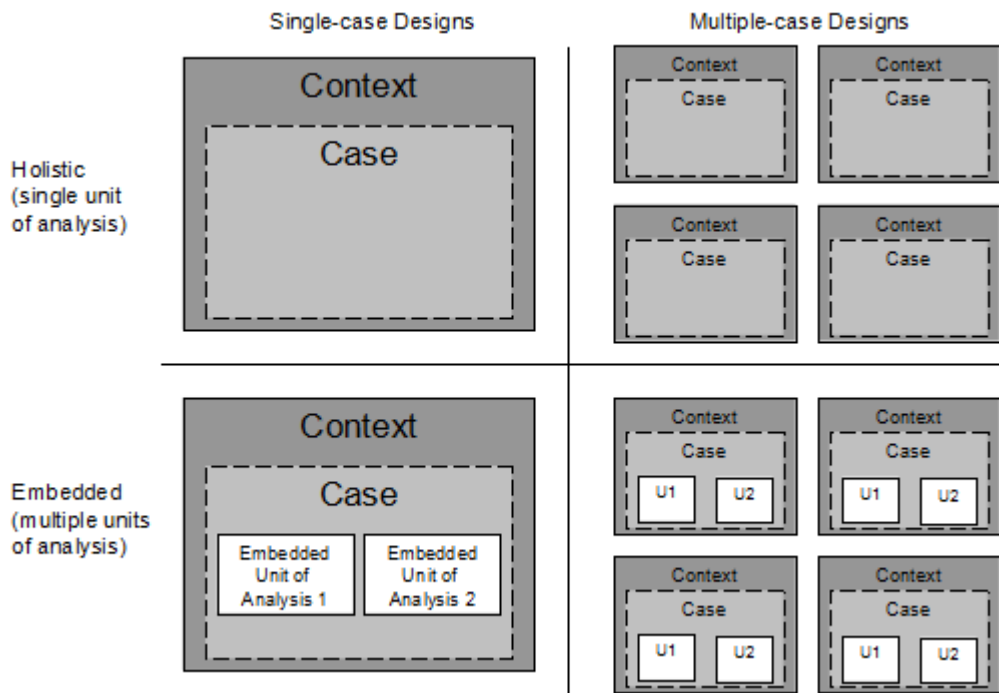


Figure 30: Basic types of case study methods (Yin, 2003)

However, case studies are often accused of being subjective, lacking rigor and yielding findings that cannot be generalized across settings (Patton & Appelbaum, 2003). For example, Yin (1984) notes that “too many times, the case study investigator has been sloppy, and has allowed biased views to influence the direction of the findings”. Zainal (2007) suggests that case studies provide very little basis for scientific generalization since they use a small number of subjects.

### 3.4 Research technique

Research techniques can be understood as concrete “instruments” or “tools” for analyzing data which have an explicit, compelling and prescribing character

(Saunders *et al.*, 2007). According to Jonker and Pennink (2010), the choice of techniques is always intentional as the researcher knows beforehand what a specific technique (or combinations of techniques) can and will deliver when applied.

Analyzing data is the process of turning data into information which is in a form that can be used for achieving the final research goals. It is certainly true that some techniques are specifically designed for quantitative (numeric) data, whereas others are only applicable to data that is qualitative (non-numeric) in nature. However, it is worth noting that often the distinction between qualitative and quantitative data is blurred. Some qualitative data can be translated into, and analyzed using some of the quantitative techniques, whereas some quantitative data often needs to be analyzed further using qualitative techniques (Lancaster, 2005). Hence, quantitative as opposed to qualitative is not a dichotomy; the combination of two techniques presents a more enhanced insight into the research phenomenon and gives a more reliable result through cross-validation (Lazaro & Marcos, 2005; reswell, 2012).

### **3.5 Choices the researcher has to make**

McGrath (1982) describes the process of making methodological choices as “dilemmatics”, in that there are no ideal solutions, only a series of trade offs. The choices that the researcher made for this thesis are based on the Jonker and Pennink’s “Research Pyramid” (2010), and consist of a set of assumptions and considerations



(see figure 31).

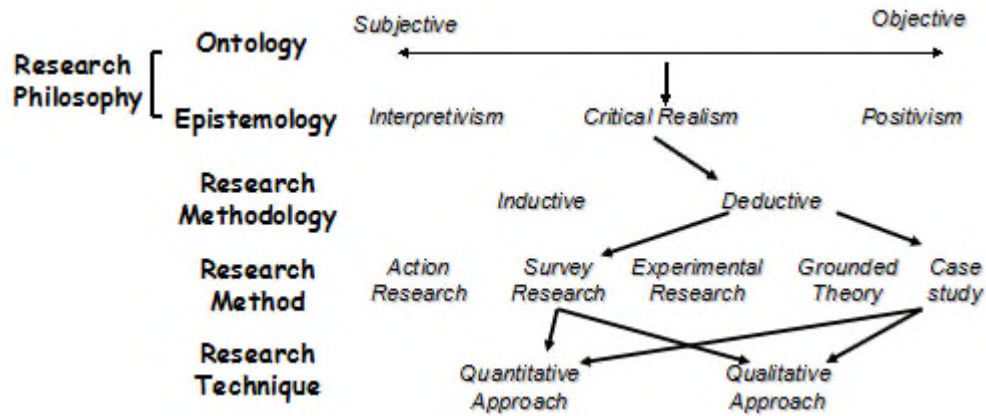


Figure 31: Research methodological choices

This research aims to build a growth predictive system for Chinese SMEs. As mentioned earlier, when researching the different aspects of SME growth, it is first necessary to define growth. People certainly have different (subjective) definitions of “growth” based on their different backgrounds, just like there is no universal set of criteria to evaluate beauty among all people. However, although “growth” is so subjective, it also needs to be measured and studied scientifically. It is pointless to calculate SMEs with good growth potential today but they go bankrupt tomorrow. Hence, this research is inclined towards critical realism which sits in a middle ground between positivism, with its emphasis on objective truth, and interpretivism, with its stress on the subjective nature of human knowledge.

As there was a sufficient body of knowledge in the literature regarding different

aspects of SME growth, it was decided to adopt a deductive approach in which the researcher develops a theory and designs a research strategy to test the formulated theory, rather than taking an inductive approach that starts with the observations and theories are formulated towards the end of the research and as a result of observations.

Undoubtedly, there is always a trade-off between breadth and depth. One of the features that distinguished this research from past studies of SME growth was its use of survey and case study methods (multi-method complementarity) to provide both breadth and depth of analysis. The following table 6 summarized other methods which were available but not applied to the current research.

<i><b>Research Methods</b></i>	<i><b>Reasons why it was not applied</b></i>
Action research	In action research, researchers are participants and can be referred to as “insider researchers” who are part of the situation they are investigating. However, this research was undertaken from the “outsider” perspective.
Experimental research	It attempts to manipulate independent variables (growth capabilities and growth indicators) to observe behavior of the dependent variables (growth potential), which is not possible to be achieved by the researcher.
Grounded theory	It starts with data collection and then induces theory. However, as there was a sufficient body of knowledge in the literature, this research adopted a deductive approach.

Table 6: Available research methods

In terms of data analysis, critical realism assumes that all techniques have limits and emphasizes the application of triangulation strategy so that diverse viewpoints or

standpoints cast light upon a topic. Specifically, in order to improve understanding and enhance credibility of the study, the researcher has argued that the two traditions (qualitative and quantitative approaches) should not have a separate-but-equal status, and should instead be combined.

In summary, this research inclined towards critical realism and undertook a deductive approach, thus, survey and case study methods were applied, and adopted triangulation strategy for data analysis.

### 3.6 Research design

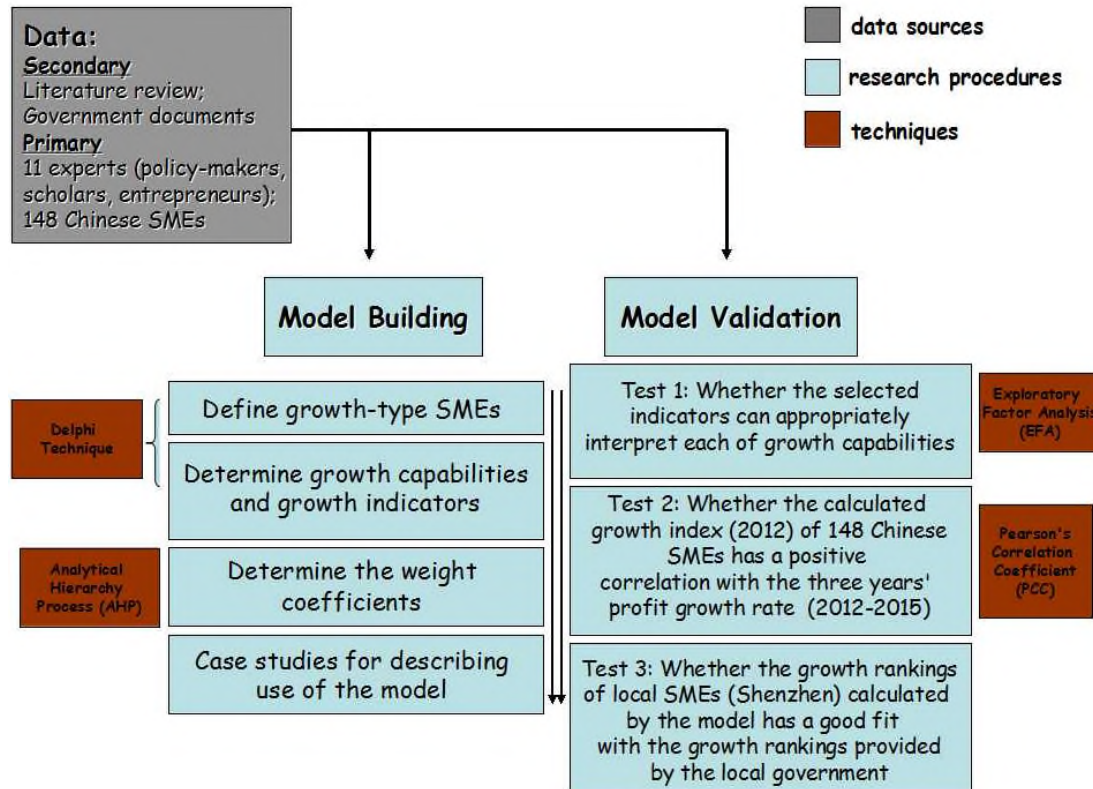


Figure 32: Research design

Based on the choices made in the previous section regarding the research philosophy, methodology, methods and follow-up techniques, a coherent and logical plan of how the researcher would go about fulfilling the research objective was developed (see figure 31).

This research aims to build a growth predictive system for Chinese SMEs. This process is divided into two subsets: model building and model validation.

In the model building process, the literature review provided very diverse interpretations of different aspects of SME growth. Besides, a properly thought-out consensus among eleven experts of SMEs in China (policy makers, scholars, entrepreneurs) was developed. Using such experts' opinions (through Delphi Technique and Analytical Hierarchy Process) enhances the reliability of the final results dramatically. Finally, cases studies were undertaken for describing the use of the model.

To do the model validation as comprehensively as possible, the researcher randomly selected 148 Chinese SMEs, and did three tests for addressing three different questions:

- Whether the selected growth indicators can appropriately interpret each of the growth capabilities? (Exploratory Factor Analysis)

- Whether the calculated growth index (2012) of 148 Chinese SMEs has a positive correlation with the three years' profit growth rate (2012-2014)? (Pearson's Correlation Coefficient)
  
- Whether the growth rankings of local SMEs (Shenzhen) calculated by the predictive system has a good fit with the growth rankings provided by the local government?

### **3.7 Data collection and processing**

In the model building process, besides a systematic review and analysis of the literature, using experts' opinions through Delphi technique enhances the reliability of the final results dramatically. The experts including policy-makers, scholars and entrepreneurs are believed to have either a strong academic background or extensive knowledge on Chinese SMEs. In the first stage, based on the specific criteria (see appendix 1), 13 policy-makers, 20 scholars and 22 entrepreneurs were chosen as candidates. In the second stage, these candidates were contacted individually via email or phone about the research plan. The Delphi is a method for collecting, organizing, reviewing, and revising the opinions of a group of experts who never actually meet, so can take a long time (Rogelberg, 2007). Therefore a large number of candidates refused to participate. Here, I am indebted to those policy-makers, scholars

and entrepreneurs who spend almost 3 months taking part in the research.

In order to let the model developed in this paper see the light of day in the real business world, the researcher collected data from randomly selected 148 Chinese SMEs. Data regarding SMEs in developing countries are extremely difficult to obtain. In this study, questionnaire containing both qualitative and quantitative elements was designed by the researcher, and then reviewed by SME experts to ensure its validity. By using the researcher's Guanxi, questionnaires were sent out to 496 entrepreneurs on the SME Annual Conference, and 478 were returned back. However, after evaluating the reliability, only 148 were qualified to be used. The reasons were briefly summarized as follows: First, entrepreneurs refused to provide some data owing to confidentiality issues, so questionnaires were answered incompletely. Second, entrepreneurs are less rigorous towards surveys, so questionnaires were answered illogically and inconsistently.

#### **4 MODEL BUILDING**

Besides a systematic review and analysis of literature on different aspects of SME growth in China, using experts' opinions through the Delphi technique was also useful to determine the growth predictive system. The Delphi technique, by definition, is a group process involving an interaction between the researcher and a group of identified experts on a specific topic (Imran, 2007). Delphi, in contrast to other data gathering and analysis techniques, employs an anonymous and iterative procedure that seeks to gain "the most reliable consensus" (Dalkey & Helmer, 1963); and has been widely used to generate business forecasting. For this research, eleven experts of SMEs in China, including policy-makers, scholars and entrepreneurs, were invited to take part in the Delphi study (see appendix 1). The experts selected are believed to have either a strong academic background or extensive knowledge based on their experience and occupation.

#### 4.1 Defining growth-type SMEs

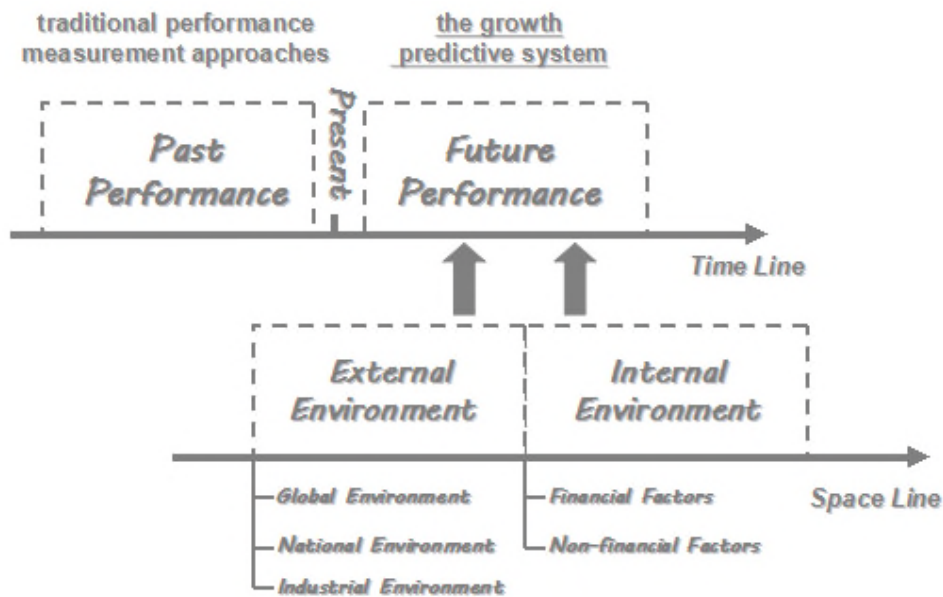


Figure 33: Framing organizational growth

As shown in the figure 32 above, compared with traditional measurement approaches that do not completely capture future performance, the predictive system allows users to gain a better understanding of Chinese SMEs' growth potential. As mentioned earlier, each enterprise is a complex system and an organic integration of various resources. These resources are never completely utilized and are the wellspring of a firm's growth.

Based on bionic philosophy, all living species exist within ecosystems and arrive at their current biological form through an evolutionary process in response to changes in their ecosystems. Similarly, enterprises operate in their constantly evolving



“business ecosystems” (rather than a vacuum) and also need to follow Darwin’s law of “survival of the fittest”. In this respect, growth potential should be measured based on a holistic approach which incorporates the internal and external environmental elements. The internal environment consists of a firm’s strengths and weaknesses which include both the financial and non-financial factors, while the external environment are those factors that are generally out of the control of the firm but ultimately determine the firm’s opportunities and threats.

Thus, in this study, growth-type SMEs are defined as: *SMEs which in the long-term (next three years) possess the ability to continuously excavate and utilize both internal and external resources to achieve enterprise-environment co-evolution, and to show an expanding trend from small to big and from weak to strong.*

#### **4.2 Determining growth capabilities and growth indicators**

**Solvency Capability (C1):** It is a measure of a firm’s ability to meet its short-term and long-term financial obligations. In China, the majority of SMEs are keen on becoming bigger and pay more attention to the increase in size or scale of operations. Finally, blind expansion may give rise to insolvency and eventually bankruptcy. It is just like a woman with an ectopic pregnancy may experience common signs externally (such as belly growth), however, there is no space or nurturing tissue inside for a pregnancy to develop. This provides the best explanation of many cases where

SMEs perform well today but go bankrupt tomorrow. Solvency capability can be measured by the following indicators:

1.  $\text{gearing ratio} = \text{total liabilities} \div \text{total assets}$

The gearing ratio is used mainly for analyzing a company's capital structure and thus assessing its financial position in the long run. A high gearing ratio is indicative of a great deal of leverage, where a company is using debt to pay for its continuing operations. The situation is especially dangerous in a business downturn when sales dip sharply and interest rates rise rapidly. A low gearing ratio may be indicative of conservative financial management, thus the company is not growing as quickly as it could. There is a broad consensus among experts that an optimal level of gearing ratio is between 30% and 50%.

2.  $\text{cash ratio} = (\text{cash} + \text{cash equivalents}) \div \text{current liabilities}$

The cash ratio is an indicator of a company's liquidity that further refines both the current ratio (current assets  $\div$  current liabilities) and quick ratio ((current assets - inventory)  $\div$  current liabilities). It is the most stringent and conservative, as it only looks at the most liquid short-term assets of the company, which are those that can be most easily used to pay off current obligations. When the cash ratio is too low, this could signal a liquidity crisis. Almost 1,000,000 SMEs in China are closed every year

after running out of cash (NBS, 2013). Contrarily, a very high cash ratio may be indicative of poor asset utilization. For a company to hold large amounts of cash on its balance sheet may not be the best strategy, as this money could be used elsewhere to generate higher returns. There is a broad consensus among experts that an optimal level of cash ratio is between 30% and 60%.

**Operation Capability (C2):** David was able to beat Goliath because, while Goliath was very big, muscular and well-armed, David was agile, intelligent, and armed with a weapon that particularly suited his abilities and the competitive arena in which they faced each other. Similarly, SMEs are not just scaled down versions of large enterprises; they go about their business in a number of fundamentally different ways. Operational capability is a measure of a firm's ability to utilize its resources efficiently and effectively. By using appropriate strategies, a firm's resources would generate core competencies, and finally gain a competitive edge over its counterparts. Operation capability can be measured by the following indicators:

1. *total asset turnover ratio = sales ÷ total assets*

The total asset turnover ratio measures the ability of a company to use its assets to generate sales. It is very obvious that a higher turnover ratio is preferred to reflect that the company is generating more sales per dollar of assets. Increases in the asset turnover ratio over time may indicate a company is growing into its capacity, while a

decreasing ratio could be a sign of over-investment in assets or failure to make the best use of those that already exist. SMEs have more constraints in resources as compared to large firms, so need to utilize their scarce resources optimally. It is worth noting that to get a true sense of how well a company's assets are being used, it must be compared to other companies in its industry. There is a broad consensus among experts that the total asset turnover ratio for SMEs should not be lower than one.

2. accounts receivable turnover = net credit sales ÷ average accounts receivable

The accounts receivable turnover measures the efficiency of a business in collecting its credit sales. According to a survey, accounts receivable has accounted for 40% to 50% of liquid assets in Chinese SMEs (Hu & Lin, 2009). Credit sales are a double-edged sword: on the one hand, they promote sales because of a more liberal policy; and on the other hand, they also increase the financial burden of enterprises - having a large amount of accounts receivable involves various categories of costs (collection cost, capital cost, delinquency cost, and default cost). For example, in order to fight for market share, SMEs in China blindly give customers credit sales without investigation or further understanding of the customer credit situation, which leads to an unusually high bad-debt ratio of 10%, far higher than 0.5% for US SMEs (Wang & Xie, 2010). There is a broad consensus among experts that the general economic conditions, industry practices, and internal policies have a strong impact on the level of receivables; and the minimum acceptable accounts receivable turnover for

SMEs is six (times).

3.  $inventory\ turnover = cost\ of\ goods\ sold \div average\ inventory$

The inventory turnover shows how many times a company's inventory is sold and replaced over a period of time. Large inventories allow the company to produce and purchase economically, and to prepare for an increase in sales. However, maintaining a large inventory requires costs, storage space, management systems, and personnel to track it. Another disadvantage is that certain goods might not sell owing to shifts in market demand. Analyzing statistically, manufacturing SMEs are pervasive in China in labor-intensive industries, such as apparel, footwear, furniture, TV sets, most of which began to experience massive excess capacity since 2005 owing to a series of external and internal factors. Under the circumstances, determining and maintaining optimal level of inventories remains a major challenge for SMEs in China (Liu, 2012; Zhang, 2014). There is a broad consensus among experts that the minimum acceptable inventory turnover is five (times).

**Profit Capability (C3):** Profitability derives from the relationship between sales and costs, and is a necessary condition for growth as well as survival. However, Chinese SMEs are facing a series of external and internal factors that could have significant adverse effects on their profitability (see table 7). As a result, notwithstanding their large share in all enterprises and the overall employment generated, SMEs in China

continue to remain weak on the profit front when compared with their large counterparts (see table 8). Profit capability can be measured by the following indicators:

External Factors	Global Environment	In the macro context of world financial integration, the sub-prime crisis in the U.S. and European sovereign-debt crisis severely damaged the growth of the world economy, which caused a reduction in market demand and induced widespread trade protectionism.
	National Environment	China is losing its competitive edge as a world manufacturing base owing to continuously rising labor and material costs, RMB's external appreciation, etc.
	Industry Environment	According to official estimates, China's capacity utilization across all industries barely tops 70% (compared with a healthy 80% in the U.S.). Therefore, Chinese SMEs will not return to financial health unless there is a huge increase in demand that can absorb an extra 10% of potential industrial output (Pei, 2015).
Internal Factors	Most SMEs in China are still concentrated at the bottom of the global value chain, and more vulnerable to external influences.	

Table 7: External and internal factors influencing SME profitability

	Large Companies	SMEs	Total
Number of Enterprises (percentage)	0.7%	99.3%	100%
Employees (percentage)	21.2%	78.8%	100%
Total Profit (percentage)	36.8%	63.2%	100%

Table 8: Chinese SME statistics (Lin & Li, 2011)

1.  $net\ profit\ margin = net\ income \div sales$

The net profit margin is the percentage of sales remaining after all expenses and taxes have been deducted, i.e. net income. A higher net profit margin indicates that a business is more effective in converting sales into actual profit. Most SMEs in China are labor-intensive manufacturing enterprises, and only provide low value-added and easily substitutable goods. Over the past decade, the profit margin of them has been severely squeezed with the decreasing orders (sales) and increasing costs. A nationwide survey reported that the average profit margin of Chinese SMEs was only 1.5% (compared to 26% for German SMEs); 25% of them were operating at a loss while less than 30% were enjoying a comfortable profit margin of more than 5% (China's NBS, 2013). There is a broad consensus among experts that most SMEs in China are still concentrated at the bottom of the global value chain, and urgently need to transform and upgrade themselves from labor-intensive to technology-intensive and knowledge-intensive enterprises. A net profit margin consistently in excess of 10% is considered excellent.

2.  $profit\ per\ employee = net\ income \div number\ of\ employees$

Companies focus far too much on measuring returns on invested capital (ROIC) rather than on measuring the contributions made by their talented people. Profit per employee, as an output-based measure, focuses the minds of managers on increasing

profit relative to the number of people a company employs. It indicates how efficiently a company is utilizing its human resources. In SMEs, owing to their small size, each individual has a greater influence on business performance than in large corporations. One way to improve their performance is to create and use key performance indicators (KPIs) for shedding low-profit employees. Analyzing statistically, it is important to note that in US SMEs, operating in medium- and highly-technological intensive industries which account for 88% of the total, the ratio (profit per employee) is much higher than that of Chinese labor-intensive SMEs.

**Innovation Capability (C4):** Innovation is broadly seen as an essential component of competitiveness, embedded in the organizational structures, processes, products and services within a firm. As a result, it is not only the job of R&D, but should be an integral part of the company's philosophy and in the minds of every employee throughout the working week. In spite of the resource constraints, SMEs often are better placed for innovations than their large counterparts due to the flexibility and agility. In China, low cost, labor-based comparative advantages are shrinking in recent years; while simultaneously customers are becoming more imaginative and assertive in their demands. Under the circumstances, innovation is not just a luxury or overhyped buzzword, but is becoming one of the key drivers of sustainable growth for SMEs. However, there is still a huge gap between Chinese and Western SMEs in both innovation inputs and outputs. Innovation capability can be measured by the following indicators:



1.  $innovation\ input\ ratio = innovation\ expenditures \div sales$

The innovation input ratio is an indicator for the relative extent to which the focal firm is engaged in innovation. It is important to note that SMEs innovate differently from big companies and should not be regarded simply as scaled down versions of large enterprises. Specifically, SMEs generally focus their efforts on informal, incremental innovation activities, investing little in radical innovation activities such as in-house R&D (OECD, 2013). Owner/managers in SMEs are shown to be essential for generating and enhancing an innovation culture. However, in China, the majority of SMEs are keen on “big”, while ignoring the “strong”. They pay more attention to “quantity” growth and neglect the improvement of “quality” (Chen, 2002). In a highly uncertain business environment, without innovation as the core competency, Chinese SMEs find it increasingly difficult to grow or even survive in their respective markets.

2.  $net\ income\ growth\ rate = (actual\ net\ income - previous\ net\ income) \div previous\ net$   
 $income$

All the innovation inputs and innovation processes have to result in better firm performance compared to companies that do not innovate. There are several traditional indicators for innovation outputs (number of patents, product announcements, share-in-sales of new products, etc.), but all of them are not adequate for SMEs. In SMEs, innovation is not only about designing a new product to sell, but

also focuses on existing business processes and practices to improve operational efficiency. It is particularly true for SMEs that R&D does not capture all aspects of innovation, and therefore a new indicator for measuring innovation effectiveness (within SMEs) was proposed by experts in this research. The rationale behind this is that firms are not trying to innovate but to earn money, and successful innovation turns ideas into profit.

**Human Resource Capability (C5):** In order to survive and grow in the present knowledge-based economy, entrepreneurs need to recognize the organic nature of their enterprises rather than treating them as a simple mechanical cash machine. Stewart (2010) makes the point that management is all about people. As a major source for sustainable competitive advantage, human resources (HR) control all the other resources and become the single element which the competitors cannot duplicate. The impact of the HR capability on the firm's performance and its involvement in developing business strategies are becoming increasingly important particularly in SMEs. Compared to large firms, SMEs have an even greater need to utilize the skills and knowledge of individual employees. Most SMEs do not have a formal HR department, and prefer to manage people in an informal way which helps in developing a feeling of teamwork and in increasing employee motivation (Brand & Bax, 2002; Mayson & Barret, 2006). Nevertheless, SMEs in China are facing many HR challenges owing to their traditional family-run and family-management practices,

such as nepotism. As a result, they are struggling to attract and retain high calibre employees. Human resource capability can be measured by the following indicators:

1. training & development input ratio = training & development expenditures ÷ sales

If recruitment can be seen as the first people management task underpinning the entry of a new employee into an organization, training & development can be seen as the second to making the new recruit a valuable member of the company. However, SMEs due to a low level of awareness have shown marked reluctance to become involved in training & development. In 2011, Chinese SMEs spent only 0.25% of their total personnel cost to training & development, far behind than 2.5% of their large counterparts (NBS, 2011). Moreover, training & development in SMEs is often described as informal, unplanned, reactive, and short-term oriented (Jolly, 2003). In fact, in a constantly changing business environment, the quality of employees and the continual improvement of their skills and knowledge through training & development are recognized as vital factors in ensuring the long-term growth of SMEs.

2. employee turnover rate per year = number of separations ÷ average number of  
employees

Based on a survey conducted in 2010, family business make up 85.4% of SMEs in China (Xi, 2011). As the family business organizations grow, the weaknesses of their

management (nepotism, letting emotions run the business, delegation deficiency, etc.) will start to overrun the strengths, so providing limited opportunities for career progression. As a result, SMEs in China have a problem in attracting and retaining talented and experienced employees, and are mostly seen as a stepping-stone to move to larger organizations. In 2008, the average turnover rate in Chinese SMEs was more than 50%, far higher than 15% which was a reasonable turnover rate. The departure of highly knowledgeable employees is a major threat to SMEs and is a major issue for the owner/managers (Molnar *et al.*, 2011; Xu *et al.*, 2012).

**Insight Capability (C6):** As mentioned earlier, enterprises operate within constantly evolving business ecosystems that are generally out of the control of the business but ultimately determine their opportunities and threats, so need to be highly adaptable in order to survive and grow. For example, China's accession to WTO means enterprises cannot rely on government protection and they will have to face an influx of foreign competitors; but it also means easier access to international best-practice. Based on bionic philosophy, a firm's insight capability is analogous to the function of human nervous system, which is concerned with receiving information from the outside world, processing it, and then generating appropriate responses. Insight capability is a firm's ability to co-evolve with the external environment, and can be measured by the following indicators:

1. ICT input ratio = ICT expenditures ÷ sales

ICT is defined as any technology that facilitates communication and assist in capturing, processing and transmitting information electronically (Akunyili, 2010). The spread of ICT which is said to “compress space” and “put an end to geography” was forecast to revolutionize the way business is conducted (De la Torre & Moxon, 2001). SMEs often have less control over key environmental elements compared to big companies, so must be vigilant about external changes and highly flexible to provide a fast response. The use of ICT enables them to communicate with the outside world efficiently and effectively, so is no longer a matter of choice, but a must for the survival of SMEs in the future. Existing literature reveals that SMEs in China face numerous challenges to the adoption of ICT, such as poor telecommunications infrastructure, high cost of ICT implementation, lack of skilled ICT personnel (Tan *et al.*, 2010). However, there is a broad consensus among experts that the most important thing to accelerate the process of ICT application is to realize its huge potentials by owner/managers.

2. networking intensity (0 ~ 100)

The Resource-Based View (RBV) as discussed in section 2.3 suggests that each enterprise is a complex system and an organic integration of various resources, so inducing or reinforcing heterogeneity among firms. As a result, individual firms

cannot be good at everything, and must specialize and learn to combine their capabilities with those of other groups and organizations. Networks that facilitate resource sharing can help SMEs to overcome their size-specific disadvantages, and they can be vertically and horizontally organized. Vertical networks refer to collaborative partnerships among all players (suppliers, focal firms, customers, and third parties) along the linear, upstream-downstream value chain; while horizontal networks encompass initiatives such as strategic alliances or joint ventures among firms occupying the same position in the value chain. In order to highlight the relevance of networks in building sustainable competitive advantages for SMEs, scholars have adopted terms such as “collective efficiency”, “collaborative advantage”, and “inter-organizational competitive advantage” (Bititci *et al.*, 2004). As shown in figure 33 and table 9 below, a new way for measuring SME networking intensity was proposed by experts in this research.

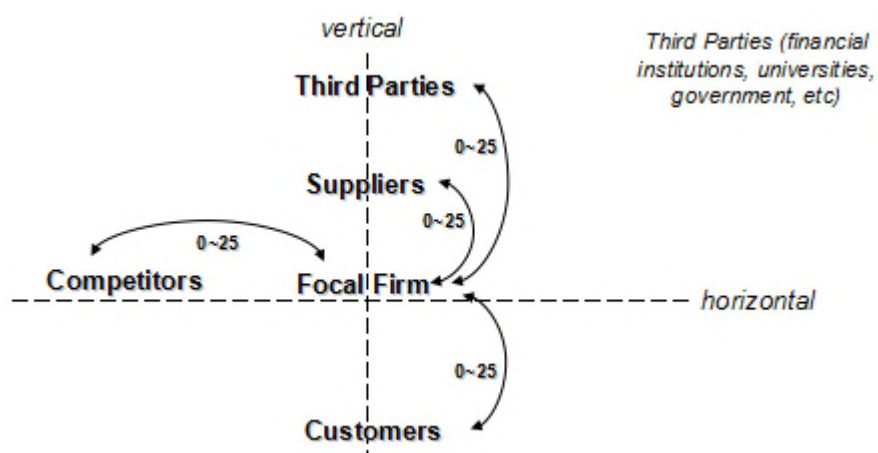


Figure 34: Networking intensity measures

Relationships Level of Intimacy	Very Low (0)	Low (5)	Medium (15)	High (20)	Very High (25)
Focal Firm ~ Customers					
Focal Firm ~ Suppliers					
Focal Firm ~ Third Parties					
Focal Firm ~ Competitors					

Table 9: Networking intensity measures

**Business Confidence Index (BIC) (C7):** There’s a Chinese proverb that says “man proposes, god disposes”. Everyone has heard of the theory that the dinosaurs became extinct because of some truly dramatic changes in the natural ecosystem. Business ecosystems, in analogy with the way that natural ecosystems are running, are those factors that are generally out of the control of the firm but ultimately determine the firm’s opportunities and threats. The business confidence index, published quarterly by the National Bureau of Statistics, is a leading indicator for anticipating external changes. It comprehensively reflects the industry situation and the expected direction based on input from entrepreneurs’ judgments on the macro economic situation. The business confidence index is released in the range of 0~200, with 100 as the critical value, above the critical value tends to reflect a good and optimistic business climate, and vice versa tends to be poor and pessimistic.

**As shown in figure 34 below, the growth capabilities and growth indicators have been scientifically selected to reflect a firm’s growth potential based on a holistic**

approach which incorporates financial and non-financial, backward looking and forward looking, external and internal elements.

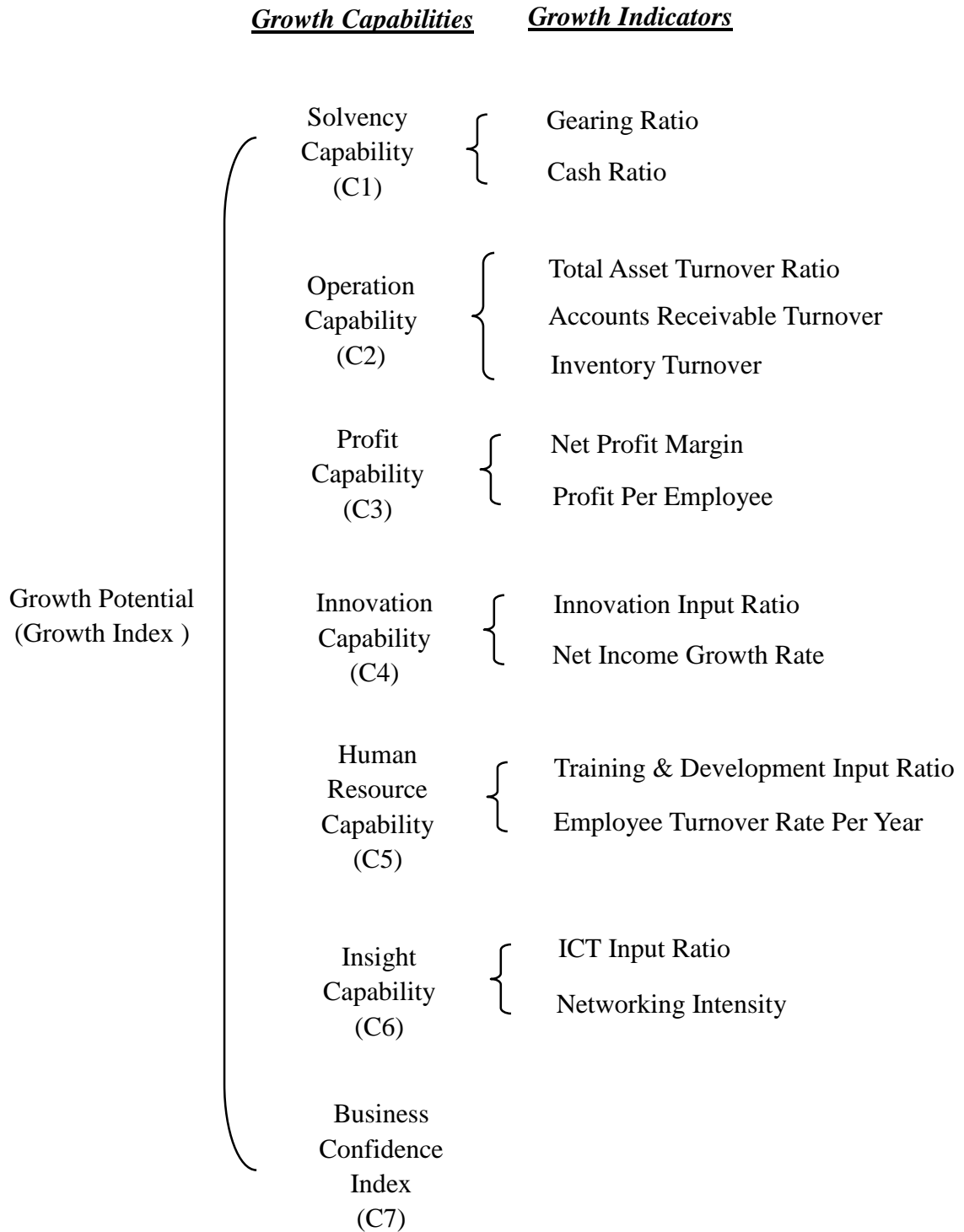


Figure 35: The growth predictive system for Chinese SMEs



### **4.3 Determining the weight coefficients**

The next step is to quantify the relative importance of each parameter. The Analytic Hierarchy Process (AHP) has been adopted for this research after making a comparison between statistical methods that were utilized in the other SME growth related studies (Data Envelopment Analysis, Grey System Theory, Comprehensive Judging Method of Fuzzy Mathematics, etc.). AHP is an intuitive method for formulating and analyzing decisions, and has the flexibility to combine both quantitative and qualitative factors.

Eleven experts of SMEs in China, including policy-makers, scholars and entrepreneurs, came together to discuss whether each factor is much more important, rather more important, and so on down to far less important, than others on the same level (a 1~9 scale was adopted). The pair-wise comparison matrix was completed based on the experts' consensus achieved through the Delphi study (see appendix 2). Then, the eigenvalue method on weight matrix in AHP is proposed. The table below gives a worked example in terms of seven growth capabilities to be compared.

### Calculate the weight coefficients

<b>Growth Capability</b>	Solvency Capability	Operation Capability	Profit Capability	Innovation Capability	HR Capability	Insight Capability	Business Confidence Index
Solvency Capability	1	1	1/2	2/5	1	2/3	2/3
Operation Capability	1	1	1/2	2/5	1	2/3	2/3
Profit Capability	2	2	1	4/5	2	4/3	4/3
Innovation Capability	5/2	5/2	5/4	1	5/2	5/3	5/3
HR Capability	1	1	1/2	2/5	1	2/3	2/3
Insight Capability	3/2	3/2	3/4	3/5	3/2	1	1
Business Confidence Index	3/2	3/2	3/4	3/5	3/2	1	1

Table 10: Step 1- Pair-Wise comparison matrix

<b>Growth Capability</b>	Solvency Capability	Operation Capability	Profit Capability	Innovation Capability	HR Capability	Insight Capability	Business Confidence Index
Solvency Capability	1	1	1/2	2/5	1	2/3	2/3
Operation Capability	1	1	1/2	2/5	1	2/3	2/3
Profit Capability	2	2	1	4/5	2	4/3	4/3
Innovation Capability	5/2	5/2	5/4	1	5/2	5/3	5/3
HR Capability	1	1	1/2	2/5	1	2/3	2/3
Insight Capability	3/2	3/2	3/4	3/5	3/2	1	1
Business Confidence Index	3/2	3/2	3/4	3/5	3/2	1	1
Sum	10.5	10.5	5.25	4.20	10.50	7.00	7.00

Table 11: Step 2- Sum each column

<b>Growth Capability</b>	Solvency Capability	Operation Capability	Profit Capability	Innovation Capability	HR Capability	Insight Capability	Business Confidence Index
Solvency Capability	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238
Operation Capability	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238
Profit Capability	0.190476	0.190476	0.190476	0.190476	0.190476	0.190476	0.190476
Innovation Capability	0.238095	0.238095	0.238095	0.238095	0.238095	0.238095	0.238095
HR Capability	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238
Insight Capability	0.142857	0.142857	0.142857	0.142857	0.142857	0.142857	0.142857
Business Confidence Index	0.142857	0.142857	0.142857	0.142857	0.142857	0.142857	0.142857

Table 12: Step 3- Divide each element of the matrix with the sum of its column

<b>Growth Capability</b>	Solvency Capability	Operation Capability	Profit Capability	Innovation Capability	HR Capability	Insight Capability	Business Confidence Index	Eigenvalue (Weight)
Solvency Capability	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238	0.10
Operation Capability	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238	0.10
Profit Capability	0.190476	0.190476	0.190476	0.190476	0.190476	0.190476	0.190476	0.19
Innovation Capability	0.238095	0.238095	0.238095	0.238095	0.238095	0.238095	0.238095	0.24
HR Capability	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238	0.095238	0.10
Insight Capability	0.142857	0.142857	0.142857	0.142857	0.142857	0.142857	0.142857	0.14
Business Confidence Index	0.142857	0.142857	0.142857	0.142857	0.142857	0.142857	0.142857	0.14

Table 13: Step 4- Average across the rows

## Do consistency check

People are more likely to be inconsistent because they cannot estimate precise measurement values when they deal with many intangibles (e.g. A is preferred to B, and B to C, but C is preferred to A; A is preferred to B twice, and B to C three times, but A is preferred to C only five times) (Saaty, 2002). Therefore, a consistency check is essential and can be calculated by the formula below. If CR is 0.10 or less, the experts' answers are relatively consistent; otherwise, the inconsistencies in the pair-wise comparisons need to be identified and corrected.

$$CR = CI \div RI$$

CR: consistency ratio; CI: consistency index; RI: random index

<b>n</b>	1	2	3	4	5	6	7	8
<b>RI</b>	0	0	0.58	0.90	1.12	1.24	1.32	1.41

$$CI = (\lambda \max - n) \div (n - 1)$$

In previous example of seven growth capabilities, in order to calculate  $\lambda \max$ , we first multiply on the right of the matrix of judgements by eigenvalue, obtaining a new vector. The calculation for the first row in the matrix is:

$$1*0.10+1*0.10+0.5*0.19+0.4*0.24+1*0.10+0.67*0.14+0.67*0.14=0.679$$

and the remaining six rows give 0.679, 1.354, 1.695, 0.679, 1.017, 1.017. So we can now get seven estimates of  $\lambda$  max by the simple expedient of dividing each component of (0.679, 0.679, 1.354, 1.695, 0.679, 1.017, 1.017) by the corresponding eigenvector element. This gives 0.679/0.1=6.79 together with 6.79, 7.13, 7.06, 6.79, 7.26, and 7.26. The mean of these values is 7.01 and that is our estimate for  $\lambda$  max.

$$CI = (\lambda \text{ max} - n) \div (n - 1) = (7.01 - 7) \div (7 - 1) = 0.0017$$

$$\text{Then: } CR = CI \div RI = 0.0017 \div 1.32 = 0.0013 < 0.10 \text{ (consistent)}$$

Hence, the results are shown in Table 14 below (CR for each matrix is less than 0.10).

	<b>Growth Capabilities</b>		<b>Growth Indicators</b>	
<b>Growth Potential (Growth Index)</b>	Solvency Capability	10%	Gearing Ratio	33.3%
			Cash Ratio	66.7%
	Operation Capability	10%	Total Asset Turnover	50%
			Accounts Receivable Turnover	25%
			Inventory Turnover	25%
	Profit Capability	19%	Net Profit Margin	50%
			Profit Per Employee	50%
	Innovation Capability	23%	Innovation Input Ratio	33.3%
			Net Income Growth Rate	66.7%
	Human Resource Capability	10%	Training and Development Input Ratio	50%
			Employee Turnover Rate Per Year	50%
	Insight Capability	14%	ICT Input Ratio	33.3%
Networking Intensity			66.7%	
Business Confidence Index	14%			

Table 14: The Growth predictive system for Chinese SMEs

## 4.4 Case insight

### 4.4.1 Data collection

In order to explain utilization of the model, the researcher collected data from 148 Chinese SMEs for 2012 (see appendix 3). For demonstrating the reliability and validity of the model, SMEs were not lumped together as one group, but were classified based on geographical distribution, size, industry, age, and ownership from the stage of data collection to ensure that the sample covers all types of SMEs to represent the population (see table 15).

SME Classification				Total
<b>Geographical Distribution</b>	Eastern Area: 87	Middle Area: 46	Western Area: 15	148
<b>Size</b>	Micro: 76	Small: 47	Medium: 25	148
<b>Industry</b>	Manufacturing: 108	Non-manufacturing: 40		148
<b>Age</b>	Young (3 years or less): 46	Long-lived (more than 3 years): 102		148
<b>Ownership</b>	Family-owned: 117	Non-family-owned: 31		148

Table 15: SME Classification

### 4.4.2 Data processing

Data processing involves translating the answers in surveys into a form that can be utilized to produce statistics.

a) **Forward processing:** In this research, the 14 growth indicators can be classified

into three different types: forward indicator (the bigger, the better), reverse indicator (the smaller, the better), and moderate indicator (there is an optimal level) (see table 16).

<b>Growth Indicators</b>	<b>Type</b>
Gearing Ratio	Moderate Indicator
Cash Ratio	Moderate Indicator
Total Asset Turnover	Forward Indicator
Accounts Receivable Turnover	Forward Indicator
Inventory Turnover	Forward Indicator
Net Profit Margin	Forward Indicator
Profit Per Employee	Forward Indicator
Innovation Input Ratio	Forward Indicator
Net Income Growth Rate	Forward Indicator
Training and Development Input Ratio	Forward Indicator
Employee Turnover Rate Per Year	Reverse Indicator
ICT Input Ratio	Forward Indicator
Networking Intensity	Forward Indicator
Business Confidence Index	Forward Indicator

Table 16: Different types of growth indicators

Reverse indicators and moderate indicators need to be transformed to forward indicators by the following:

Reverse (indicator) → Forward (indicator):  $x' = 1/x$

Moderate (indicator) → Forward (indicator):  $x' = 1/|x-A|$      A: optimum value

**b) Data standardization:** This step is essential when dealing with parameters of different units and scales. Z-score normalization is the most commonly used method

to convert all indicators to a common scale with an average of zero and standard deviation of one ( $\mu=0, \sigma=1$ ).

$$x' = (x-\mu)/\sigma$$

#### 4.4.3 Growth index calculation (as shown in figure 34 and table 14)

**Growth Index** = 0.1×Solvency Capability + 0.1×Operation Capability + 0.19×Profit Capability + 0.23×Innovation Capability + 0.1×Human Resource Capability + 0.14×Insight Capability + 0.14×Entrepreneur Confidence Index

= 0.1×(0.333×Gearing Ratio + 0.667×Cash Ratio) + 0.1×(0.5×Total Asset Turnover + 0.25×Accounts Receivable Turnover + 0.25×Inventory Turnover) + 0.19×(0.5×Net Profit Margin + 0.5×Profit Per Employee) + 0.23×(0.333×Innovation Input Ratio + 0.667×Net Income Growth Rate) + 0.1×(0.5×Training and Development Input Ratio + 0.5×Employee Turnover Rate Per Year) + 0.14×(0.333×ICT Input Ratio + 0.667×Networking Intensity) + 0.14×Entrepreneur Confidence Index

#### 4.4.4 Case studies

In order to more clearly illustrate the calculation process and describe the model utilization, two cases of SMEs in Chinese petrochemical industry were selected.



Huachangfeng Equipment Inc. (Company A) was established in 1994 and defined its core competencies as designing, manufacturing, and installing gas filtration and separation equipment. The company owns several patents and a number of international quality certificates. With a good reputation in the petrochemical industry, it has built long-term collaborative relationships with big customers, such as SINOPEC, CNPC, and CNOOC. Beijing Yanhua Construction & Engineering Co., Ltd, (Company B) was founded in 1969. It has been operating for more than 40 years, specializing in petroleum and chemical engineering and construction.

The growth potential (growth index) of these two companies in 2012 was calculated by the predictive system as shown in Table 17.

	Growth Capabilities	Growth Indicators	A	B	Data Processing	
					A	B
Growth Potential (Growth Index)	Solvency Capability 10%	Gearing Ratio 33.3%	46%	27.6%	2.083	0.163
		Cash Ratio 66.7%	37%	56%	1.064	0.395
	Operation Capability 10%	Total Asset Turnover 50%	80%	45%	0.045	-0.517
		Accounts Receivable Turnover 25%	8	4.02	0.081	-0.589
		Inventory Turnover 25%	10	4.1	0.511	-0.493
	Profit Capability 19%	Net Profit Margin 50%	30%	3%	2.845	-0.975
		Profit Per Employee 50%	125	28.8	1.990	-1.145
	Innovation Capability 23%	Innovation Input Ratio 33.3%	5%	0.5%	2.673	-0.572
		Net Income Growth Rate 66.7%	15%	0	2.231	-0.816
	Human Resource Capability 10%	Training and Development Input Ratio 50%	1%	1%	-0.806	-0.806
		Employee Turnover Rate 50%	28%	25%	-0.895	-0.750
	Insight Capability 14%	ICT Input Ratio 33.3%	8%	1%	0.896	-0.482
		Networking Intensity 66.7%	80	40	1.562	0.003
	Business Confidence Index 14%		105.6	105.6	-0.809	-0.809

Table 17 The growth predictive system for Company A and Company B

Growth Index for Company A:

$$\begin{aligned} &0.1 \times (0.333 \times 2.083 + 0.667 \times 1.064) + 0.1 \times (0.5 \times 0.045 + 0.25 \times 0.081 + 0.25 \times 0.511) + \\ &0.19 \times (0.5 \times 2.845 + 0.5 \times 1.990) + 0.23 \times (0.333 \times 2.673 + 0.667 \times 2.231) + \\ &0.1 \times (-0.5 \times 0.806 - 0.5 \times 0.895) + 0.14 \times (0.333 \times 0.896 + 0.667 \times 1.562) - 0.14 \times 0.809 \\ &= \mathbf{1.153} \end{aligned}$$

Growth Index for Company B:

$$\begin{aligned} &0.1 \times (0.333 \times 0.163 + 0.667 \times 0.395) + 0.1 \times (-0.5 \times 0.517 - 0.25 \times 0.589 - 0.25 \times 0.493) + \\ &0.19 \times (-0.5 \times 0.975 - 0.5 \times 1.145) + 0.23 \times (-0.333 \times 0.572 - 0.667 \times 0.816) + \\ &0.1 \times (-0.5 \times 0.806 - 0.5 \times 0.750) + 0.14 \times (-0.333 \times 0.482 + 0.667 \times 0.003) - 0.14 \times 0.809 \\ &= \mathbf{-0.605} \end{aligned}$$

Each organization is a collection of unique resources and capabilities that provides the basis for its strategy. Company A consists of a small group of highly knowledgeable staff (12) and focuses on designing and producing customized high-tech petrochemical equipment, while the large-sized Company B employs more than 75 staff and adopts a mass production strategy for achieving economies of scale.

For Company A, the successful adoption of customization allows it to enjoy a comfortable profit margin of more than 30%. In order to build and maintain long-term collaborative relationships with its various stakeholders, 8% of sales is spent on the ICT infrastructure annually, far higher than the industry average. Moreover, customers,

suppliers, competitors and third parties (financial institutions, universities, government, etc.) are actively involved in Company A's innovation system in order to ascertain and fulfill individual needs and wants. In 2012, the company introduced various new products and services that provide effective solutions for overcoming the bottlenecks in the industry, so experienced a 20% sales growth and a 15% profit growth. Since continuously capturing blue oceans of uncontested market spaces and successfully adopting the differentiation strategy, Company A has created a perception in the minds of customers that its products and services possess superior characteristics that are unique from those of its competitors. However, the departure of knowledgeable employees is a major threat to the company, and the turnover rate is as high as 25%~30%. Therefore, in order to achieve sustainable growth, Company A needs to pay more attention to HR management to achieve internal stability.

For Company B, the successful adoption of mass production allows it to lower the prices by up to 10%. However, in the present business world, with shifting demographics and changing consumer tastes and preferences, mass production for homogeneous market is not enough to keep businesses going. In recent years, because there was no significant change to the products and services, Company B was fighting for its life in a very crowded marketplace and found it difficult to reach new customers. As a result of increasing labor costs and raw material costs, the company's profit margins shrank from 5% to 3% in 2012. Under a knowledge-based economy, in order to achieve sustainable growth, Company B needs to transform and upgrade

itself from labor-intensive to technology-intensive by improving the innovation and insight capabilities.

## **5 MODEL VALIDATION**

Anyone can create and develop new business model ideas on paper. It's easy to do pro-forma analysis of how a new business model might work, and it's not much more work to write up a fancy report embellishing on the potential of a hypothetical new business model. But until a business model idea sees the light of day in the real world, it is impossible to know if it will really work (Kaplan, 2012). Hence, in order to do the model validation as comprehensively as possible, the researcher collected data from randomly selected 148 Chinese SMEs, and did three tests for addressing three different questions:

- Model structure test: whether the selected growth indicators can appropriately interpret each of the growth capabilities?
- Correlation test: whether the calculated growth index (2012) of 148 Chinese SMEs has a positive correlation with the three years' actual profit growth rate (2012-2014)?
- Comparison test: whether the growth rankings of local SMEs (Shenzhen) calculated by the predictive system has a good fit with the growth rankings provided by the local government?

### **5.1 Model structure test (1<sup>st</sup> test)**

In the model building process, growth indicators (observed variables) were selected

through experts' judgments to measure each of the growth capabilities (latent factors) of SMEs. Applying reverse approach, this section will use the data collected from 148 Chinese SMEs for 2012 (see appendix 3) and adopt Exploratory Factor Analysis (EFA) (see appendix 4) to test whether the selected growth indicators (observed variables) can be reduced to the same growth capabilities (latent factors) as in the model building process (see figure 35).

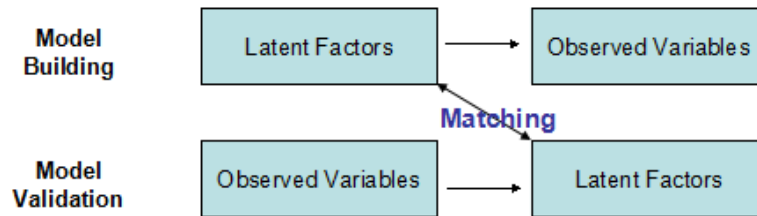


Figure 36: Reverse thinking for model structure test

EFA is a four-step heuristic approach (see figure 36) and operates on the notion that observed variables can be grouped or go together into fewer latent factors, which is known as reducing dimensionality (Bartholomew *et al.*, 2011).

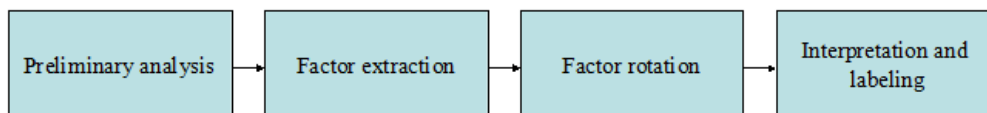


Figure 37: The four-step exploratory factor analysis

### 5.1.1 Preliminary analysis - is the data suitable for EFA?

Prior to the extraction of the factors, several tests should be done to assess the suitability of the respondent data for EFA. These tests include Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity. The KMO statistic varies between 0 and 1. A value of 0 indicates that the sum of partial correlations is large relative to the sum of correlations, indicating diffusion in the pattern of correlations (hence, EFA is likely to be inappropriate). Kaiser (1974) recommends accepting KMO values greater than 0.5. Bartlett's measure tests the null hypothesis that the original correlation matrix is an identity matrix. This test has to be significant ( $p < 0.001$ ), because for EFA to work we need some relationships between variables and if the R-matrix were an identity matrix then all correlation coefficients would be 0.

For the research, as shown in table 18 below, KMO (0.571) and Bartlett's test (significance level 0.000) indicated the data were suitable for EFA.

<b>KMO and Bartlett's Test</b>		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.571
Approx. Chi-Square		1841.288
Bartlett's Test of Sphericity	Df	78
	Sig.	.000

Table 18: SPSS output 1

### 5.1.2 Factor extraction - how many factors should be extracted?

The aim of EFA is to reduce a large number of observed variables into few latent factors. According to the K1 method (Kaiser, 1960), only constructs which has the eigenvalues greater than one should be retained for interpretation. As shown in table 19 below, SPSS identified 13 linear components within the data set. The eigenvalues associated with each factor represent the variance explained by that particular linear component. It was clear that the first 6 factors having an eigenvalue  $>1$  explained relatively large amounts of variance (85.718%) whereas subsequent factors explained only small amounts of variance (14.282%). Therefore, for the research, six latent factors should be extracted.

Total Variance Explained						
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.242	24.938	24.938	3.162	24.321	24.321
2	2.453	18.872	43.809	2.379	18.297	42.618
3	1.935	14.882	58.691	1.783	13.717	56.335
4	1.744	13.416	72.107	1.567	12.052	68.387
5	1.355	10.425	82.532	1.294	9.957	78.343
6	1.301	10.004	92.535	.959	7.375	85.718
7	.429	3.299	95.834			
8	.196	1.509	97.343			
9	.132	1.017	98.361			
10	.098	.756	99.116			
11	.055	.420	99.536			
12	.040	.306	99.842			
13	.020	.158	100.000			

Table 19: SPSS output 2



### 5.1.3 Factor rotation

Unrotated results from EFA - as presented in table 19 - is not easy to interpret. In order to produce a simplified solution, the axes need to be rotated so that the clusters of items fall as closely as possible to them. In other words, rotation will help by maximizing high item loadings and minimizing low item loadings. SPSS output 3 as shown in table 20 illustrated the rotated component matrix which was a matrix of the factor loadings for each variable onto each factor.

Rotated Factor Matrix						
	Factor					
	1	2	3	4	5	6
1. GEARING_RATIO	-.017	-.043	.009	.094	-.009	<b>.738</b>
2. CASH_RATIO	-.166	.040	.044	-.013	-.042	<b>-.739</b>
3. TOTAL_ASSET_TURNOVER	<b>.988</b>	.020	.061	.012	.040	.073
4. ACCOUNTS_RECEIVABLE_TURNOVER	<b>.958</b>	.045	.052	.010	.034	.047
5. INVENOTRY_TURNOVER	<b>.895</b>	.029	.098	-.036	.082	.076
6. NET_PROFIT_MARGIN	.133	.188	<b>.944</b>	.027	.016	-.022
7. PROFIT_PER_EMPLOYEE	.059	.116	<b>.959</b>	.073	.050	-.021
8. INNOVATION_INPUT_RATIO	.051	<b>.967</b>	.158	.065	.015	-.054
9. NET_INCOME_GROWTH_RATE	.032	<b>.976</b>	.143	.052	-.017	-.055
10. TRAINING_DEVELOPMENT_INPUT_RATIO	.082	.036	.027	.065	<b>.897</b>	.029
11. EMPLOYEE_TURNOVER_RATE	-.043	.037	-.033	.052	<b>-.896</b>	-.006
12. ICT_INPUT_RATIO	-.022	.006	.025	<b>.949</b>	.008	.066
13. NETWORKING_INTENSITY	.008	.105	.071	<b>.936</b>	.005	.069

Table 20: SPSS output 3

#### 5.1.4 Interpretation and labeling

Interpretation involves the researcher examining which variables are highly correlated and attributable to a factor, and giving that factor a name or theme. Traditionally, at least two or three variables must load on a factor so it can be given a meaningful interpretation. As shown in table 20, 6 common latent factors have been produced based on 13 original variables:

The first common latent factor that emerged in the EFA was comprised of gearing ratio and cash ratio, so could be interpreted as solvency capability.

The second common latent factor that emerged in the EFA was comprised of total asset turnover, accounts receivable turnover, and inventory turnover, so could be interpreted as operation capability.

The third common latent factor that emerged in the EFA was comprised of net profit margin and profit per employee, so could be interpreted as profit capability.

The fourth common latent factor that emerged in the EFA was comprised of innovation input ratio and net income growth rate, so could be interpreted as innovation capability.

The fifth common latent factor that emerged in the EFA was comprised of training and development input ratio and employee turnover rate, so could be interpreted as human resource capability.

The sixth common latent factor that emerged in the EFA was comprised of ICT input ratio and networking intensity, so could be interpreted as insight capability.

#### 5.1.5 Matching

In the model building process, growth indicators were selected through experts' judgments to measure each of the growth capabilities of SMEs. Applying reverse approach in the model validation process, the selected growth indicators (observed variables) can be reduced to the same growth capabilities (latent factors) as in the model building process (see table 21). In other words the selected growth indicators can appropriately interpret each of the growth capabilities.

Model Validation		Model Building	
Gearing Ratio	Factor 1	Capability 1	Gearing Ratio
Cash Ratio	Solvency Capability	Solvency Capability	Cash Ratio
Total Asset Turnover	Factor 2 Operation Capability	Capability 2 Operation Capability	Total Asset Turnover
Accounts Receivable Turnover			Accounts Receivable Turnover
Inventory Turnover			Inventory Turnover
Net Profit Margin	Factor 3 Profit Capability	Capability 3 Profit Capability	Net Profit Margin
Profit Per Employee			Profit Per Employee
Innovation Input Ratio	Factor 4 Innovation Capability	Capability 4 Innovation Capability	Innovation Input Ratio
Net Income Growth Rate			Net Income Growth Rate
Training and Development Input Ratio	Factor 5 HR Capability	Capability 5 HR Capability	Training and Development Input Ratio
Employee Turnover Rate			Employee Turnover Rate
ICT Input Ratio	Factor 6 Insight Capability	Capability 6 Insight Capability	ICT Input Ratio
Networking Intensity			Networking Intensity

Table 21: Model structure test

## 5.2 Correlation test (2<sup>nd</sup> test)

In concept, the only way to validate a weather forecast is to compare the **forecasted** weather with the **actual** weather when it occurs. One measure of accuracy of a forecast is how close to the actual weather the forecast was (Gordon & Shaykewich, 2000). The predictive system developed in this paper aims to forecast the growth potential of Chinese SMEs in the long-term (next three years). Therefore, this section will use the data collected from 148 Chinese SMEs and adopt Pearson's Correlation Coefficient to test whether the calculated growth index for 2012 has a positive

correlation with the three years' actual profit growth rate between 2012 and 2014 (see table 22 and appendix 5).

Company Name	Calculated Growth Index (2012)	Actual Profit Growth Rate (2012~2014)
1.山西宇狮环保科技有限公司	-0.1794	-12%
2.山西泰利福机电技术有限公司	-0.0305	-6%
3.晋城市润宏新能源发电股份有限公司	-0.2753	-16%
...	...	...
146. 深圳市经富五金压铸制品厂	-0.1856	-15%
147. 景德镇市锋美机械厂	-0.0465	0%
148. 滨州嘉瑞商贸有限公司	0.2037	24%

Table 22: Calculated growth index (2012) and actual profit growth rate (2012~2014)

		Growth_Index_2012	Profit_Growth_Rate_2012_2014
Growth_Index_2012	Pearson Correlation	1	<b>.896**</b>
	Sig. (2-tailed)		<b>.000</b>
	N	148	<b>148</b>
Profit_Growth_Rate_2012_2014	Pearson Correlation	<b>.896**</b>	1
	Sig. (2-tailed)	<b>.000</b>	
	N	<b>148</b>	148

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 23: SPSS output 4

Pearson's r coefficient ranges in value from -1 to +1. A correlation coefficient of 0 indicates that no association exists between the measured variables. The closer the r coefficient approaches  $\pm 1$ , regardless of the direction, the stronger is the existing association indicating a more linear relationship between the two variables. The

significance level (or p-value) is the probability of obtaining results as extreme as the one observed. If the significance level is very small (less than 0.01) then the correlation is significant and the two variables are linearly correlated (Taylor, 1990).

As shown in table 23, the correlation report (Pearson's r coefficient value of 0.896 and significance value of 0.000) confirms a strong positive relationship between calculated growth index (2012) and actual profit growth rate (2012~2014).

The test gives us a very positive result while simultaneously generating some questions for future research:

Heterogeneity of sample: The high ratio of sample labor-intensive SMEs may reduce the reliability of the results. What happens if we increase our sample size to 500 Chinese SMEs (sample should be allocated to cover all types of SMEs)?

Bandwidth: What is the relationship between the actual profit growth rate (2012~2014) and each of the growth indicators (2012)? For example, there is speculation that the Net Income Growth Rate (2012) has a very strong positive correlation with the Actual Profit Growth Rate (2012~2014). The rationale behind this is that in the current Chinese context, based on the Guanxi concept, those businesses that are significantly outperforming in their industries already are more likely to outperform over long term.

### 5.3 Comparison test (3<sup>rd</sup> test)

There is no universally accepted way to measure a firm's growth potential, and different areas release their annual SME growth rankings separately. There are many challenges for SMEs to utilize this information:

- Regional constraints: SMEs will only be able to compare with the local firms.
- Time constraints: SMEs will only be able to get the information once a year.
- Utilization constraints: SMEs will not be able to get the whole story from the growth rankings released.

However, the growth rankings released by local government provide a good way to validate the predictive system developed in this paper. This section will test whether the growth rankings of local SMEs (Shenzhen) calculated by the predictive system has a good fit with the growth rankings provided by the local government (see table 24).

Shenzhen has been selected as the target area for two reasons:

- At the end of 2010, Guangdong province had more than 800,000 SMEs, the largest number in China, accounting for 12.54% of SMEs in the country (Chen & Cao, 2006). Shenzhen, as a major city in Guangdong province, eventually became

one of the largest cities in the Pearl River Delta region, which has become one of the economic powerhouses of China as well as the largest manufacturing base in the world.

- Among 148 SMEs, 37 come from Shenzhen, occupied 25% of the total sample.

Rank	By the Predictive System (2012)		By the Local (Shenzhen) Government (2012)
1	深圳市丰盛人生信息咨询有限公司 (N1)	0.878	深圳市丰盛人生信息咨询有限公司 (N1)
2	北京市中伦金通律师事务所深圳分所 (N2)	0.866	北京市中伦金通律师事务所深圳分所 (N2)
3	深圳市新亚洲电子市场鹏佳电子展销柜 (N3)	0.281	深圳市新亚洲电子市场鹏佳电子展销柜 (N3)
4	深圳市鑫森家政服务有限公司 (N4)	0.252	深圳市鑫森家政服务有限公司 (N4)
5	广东汕头报关服务公司深圳分公司 (N5)	0.236	广东汕头报关服务公司深圳分公司 (N5)
6	深圳市雨田实业有限公司零度网吧 (N6)	0.200	深圳市兆源祥实业有限公司 (N7)
7	深圳市兆源祥实业有限公司 (N7)	0.173	深圳市雨田实业有限公司零度网吧 (N6)
8	深圳市祥丰实业发展有限公司 (N8)	0.077	深圳市祥丰实业发展有限公司 (N8)
9	深圳市益盛饮品有限公司莲塘专卖店 (N9)	0.035	深圳市益盛饮品有限公司莲塘专卖店 (N9)
10	深圳市龙岗区平湖弘信五金塑胶行 (N10)	0.026	深圳市龙岗区平湖弘信五金塑胶行 (N10)
11	深圳桑达电子总公司 (N11)	0.024	深圳桑达电子总公司 (N11)
12	深圳市医诺尔科技发展有限公司 (N12)	-0.018	深圳市医诺尔科技发展有限公司 (N12)
13	深圳市旭日精工机械有限公司 (N13)	-0.035	深圳市旭日精工机械有限公司 (N13)
14	深圳市英亿达科技发展有限公司 (N14)	-0.084	深圳市庆顺达清洁服务有限公司 (N15)
15	深圳市庆顺达清洁服务有限公司 (N15)	-0.106	深圳市英亿达科技发展有限公司 (N14)
16	深圳市金兰家政服务有限责任公司 (N16)	-0.126	深圳市金兰家政服务有限责任公司 (N16)
17	深圳市罗湖区金金美术装饰制作中心 (N17)	-0.148	深圳市罗湖区金金美术装饰制作中心 (N17)
18	深圳市好生活送菜服务有限公司 (N18)	-0.174	深圳市好生活送菜服务有限公司 (N18)
19	深圳市天雅纸业制品有限公司 (N19)	-0.177	深圳市天雅纸业制品有限公司 (N19)
20	深圳市经富五金压铸制品厂 (N20)	-0.186	深圳市经富五金压铸制品厂 (N20)
21	深圳市天之骄投资咨询有限公司 (N21)	-0.226	深圳市天之骄投资咨询有限公司 (N21)
22	深圳市佳兴达实业有限公司 (N22)	-0.226	深圳市佳兴达实业有限公司 (N22)
23	深圳市宝安区新安军辉纸箱包装机械配件部 (N23)	-0.242	深圳市宝安区新安军辉纸箱包装机械配件部 (N23)
24	深圳市裕昌机电有限公司 (N24)	-0.242	深圳市裕昌机电有限公司 (N24)
25	深圳市嘉德信投资咨询有限公司 (N25)	-0.280	深圳市嘉德信投资咨询有限公司 (N25)
26	深圳市科知库办公自动化有限公司 (N26)	-0.294	深圳市科知库办公自动化有限公司 (N26)
27	深圳市银峰机械设备有限公司 (N27)	-0.298	深圳市迪伟亚服饰发展有限公司 (N29)
28	深圳市润盈实业有限公司 (N28)	-0.331	深圳市润盈实业有限公司 (N28)
29	深圳市迪伟亚服饰发展有限公司 (N29)	-0.333	深圳市银峰机械设备有限公司 (N27)
30	深圳市恒碧琉璃工艺品有限公司 (N30)	-0.376	深圳市恒碧琉璃工艺品有限公司 (N30)
31	深圳市心心皮具有限公司 (N31)	-0.397	深圳市心心皮具有限公司 (N31)
32	深圳市佳音信息咨询服务有限公司 (N32)	-0.410	深圳市佳音信息咨询服务有限公司 (N32)



33	深圳市朴丰实业发展有限公司 (N33)	-0.422	深圳市朴丰实业发展有限公司 (N33)
34	深圳市深保源贸易有限公司 (N34)	-0.436	深圳市深保源贸易有限公司 (N34)
35	深圳市华安行实业有限公司 (N35)	-0.462	深圳市恒开源贸易发展有限公司 (N36)
36	深圳市恒开源贸易发展有限公司 (N36)	-0.696	深圳市丰盛人生信息咨询有限公司 (N37)
37	深圳市丰盛人生信息咨询有限公司 (N37)	-0.726	深圳市华安行实业有限公司 (N35)

Table 24: Comparison test

From the table 24 above, as there were only slight differences (N6-N7, N14-N15, N27-N29, N35-N36-N37), we can conclude that the growth rankings of local SMEs (Shenzhen) given by the predictive system has a good fit with the growth rankings provided by the local government.

Therefore, by using the growth predictive system, the government can become more effective in their policy-making oriented towards SMEs because it is able to better understand the true situation of the firms and seek out their real requirements.

A government is just like parents, and SMEs are their children. When they are young, the government has responsibility to look after the children. However, it is not just about giving them financial needs, but should teach them how to get a healthy and strong body, how to manage risks and uncertainties, how to deal with the society...

In our case, compared with other SMEs, Shenzhen SMEs are highly concentrated in the electronics industry, and achieve cost advantage through mass production. They tend to mechanically imitate or copy others' product design in order to overcome the

resource constraints and reduce the cost of product development. However, in the present knowledge-based economy, without core competencies, they can only fight for their lives in a very crowded marketplace. As a result of increasing costs, the average profit margin for Shenzhen SMEs shrank dramatically to 0.8% in 2012 (compared to 1.4% for other SMEs). Moreover, because their products are labor-intensive, low value-added and easily substitutable, the bargaining power of customers is very high, resulted in a relatively low accounts receivable turnover (4.6 times for Shenzhen SMEs compared to 5.1 times for other SMEs).

In recent years, the Shenzhen government has enacted and amended policies to encourage the development of local SMEs, however, no significant improvement has emerged. It throws money at SMEs whereas what they need is support. From the above analysis, the Shenzhen government should increase the penalties for selling fake/counterfeit goods, promote technological and know-how between enterprises, and set up programmes to enhance the role of SMEs in Global Value Chains.

## **6 CONCLUSIONS**

### **6.1 Summary of research accomplishments**

This research started with emphasizing that SMEs are important engines to stimulate the economic development of China and has drawn considerable attention during the last two decades from both government and scholars. However, although much research has examined the different aspects of SME growth, no significant improvement has emerged and the real problem has boiled down to several misunderstandings around growth (short-terminism, mainly backward looking, too inward looking).

As a result, this study addressed a gap in literature regarding the need for better understanding of how to define and evaluate the growth potential of Chinese SMEs. The growth of SMEs is affected by a myriad of interacting external and internal factors; and includes not only the quantitative growth of financial indicators, but also a variety of intrinsic qualitative factors. Thus, the growth predictive system was built based on a holistic approach which incorporates multiple measures (financial and non-financial, backward looking and forward looking, external and internal elements) to allow users to gain a better understanding of Chinese SMEs' growth potential.

By using the growth predictive system as shown in Figure 34 (page 105) and Table 14 (page 110), the government could become more effective in their policy-making

oriented towards SMEs; investors and financiers could make decisions logically rather than emotionally; and SMEs could more easily formulate business strategies in today's dynamic environment to give themselves the sustainable competitive advantages over their counterparts.

## **6.2 Limitations**

Firstly, the predictive system developed in this paper was based on input from the eleven experts of SMEs in China, may reduce the reliability of the results. I tried to overcome the subjectivity by designing the model validation as comprehensively as possible, collecting and analyzing data objectively.

Secondly, regardless of its high ambitions, doctoral research is constrained by both financial and non-financial resource limitations. As a result, the findings based on only 148 selected SMEs might be criticized to be insufficient to generalize the study results. However, for demonstrating the validity of the system, SMEs were not lumped together as one group, but were classified based on geographical distribution, size, industry, age, and ownership from the stage of data collection to ensure that the sample covers all types of SMEs to represent the population.

Thirdly, because all the data in this research were collected from Chinese SMEs, so the system developed can only be adopted for SMEs in China.

### 6.3 Future research directions

Good research usually provides some answers and generates new questions. So, at the end of a doctoral thesis, there are often more questions than at the beginning.

This study has several implications for future research. Firstly, each enterprise is an organic integration of various resources and its growth prospects is determined by a set of interacting dynamic growth capabilities. In this paper, we studied the relationship between these growth capabilities and growth potential (left part of the Figure 37). Therefore, further work in this field might explore the inter-relationship between these growth capabilities (right part of the Figure 37). This can be done by adopting Structural Equation Modeling (SEM).

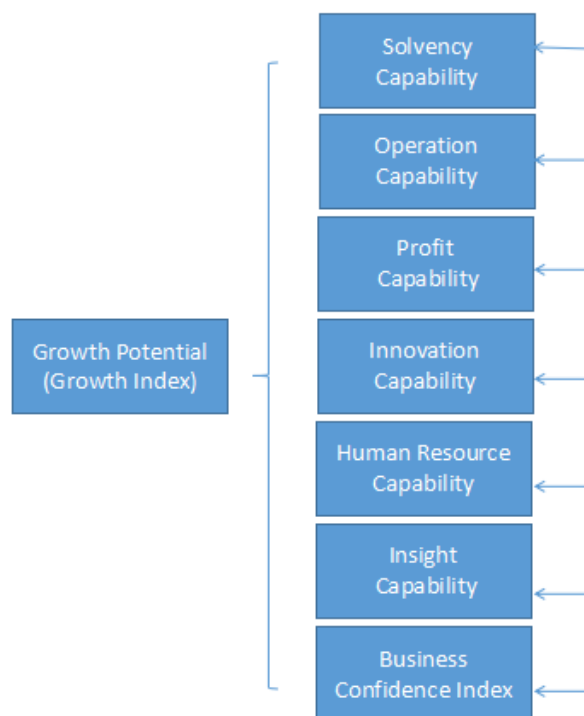


Figure 38: The growth predictive system for Chinese SMEs

Secondly, the growth predictive system is not an end in itself, but a tool for more effective management. In order for SMEs to make effective use of the results from the system, they must be able make the transition from assessment to next-step strategies, with the ultimate goal of improving organizational performance. Therefore, further work in this field might explore more thoroughly the full array of activities within the strategy process in Chinese SMEs. This can be done by designing longitudinal case studies or action research where the researcher can observe owner/managers in their day-to-day jobs.

Thirdly, the growth predictive system developed in this paper is for SMEs in Chinese contexts. Because Chinese “business ecosystem” evolves constantly, the system developed need to be reviewed and updated at least once every 3 years. For example, Chinese SMEs are experiencing turning points from labor-intensive to technology-intensive enterprises. As a result, the weight coefficient of the Human Resource Capability is supposed to increase because the greater need for highly knowledgeable employees.

Fourthly, the data published in “Fortune” in 2011 showed that the average life expectancy of Chinese SMEs was only 2.9 years compared with 7 years for US SMEs. Many SMEs in China have attempted to transplant Western business practices despite the complications and difficulties. As a result, there remains a need to further develop the growth predictive system and study how variations in the location (country) of the

firm impacts SME performance.

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## APPENDIX 1:

Eleven experts of SMEs in China were invited to take part in the Delphi study

<b>Policy-makers</b> (2)	Tang Kai: vice-president of CASME (China Association of Small and Medium Enterprises)
	Deng Wei: vice-president of CASME (China Association of Small and Medium Enterprises)
<b>Scholars</b> (5)	Dr. Yang Juan: SME research center of Peking University HSBC Business School
	Prof. Zhang Yu Ming: School of Management, Shandong University
	Dr. Wang De Sheng: School of Management, Shandong University
	Prof. Chen Xiao Hong: School of Business, Central South University
<b>Entrepreneurs</b> (4)	Prof. Chen Zi Tong: School of Management, Wuhan University
	Liu Zhi Gang: honorary mayor of the city of Baton Rouge LA USA and president of HAF/Huachangfeng Equipment Inc.
	Sun Hai Jiang: president of Beijing Yanhua Construction Engineering Inc.
	Li Xian Jin: president of Beijing BAJITE Engineering Consulting Inc.
	Jin You Jing: president of Zhejiang Huadong Rubber Inc.

### Criteria for choosing the SME experts:

**Policy Makers:** Should be on the critical position of CASME. CASME is a national wide, cross-industry and non-profitable organization. CASME focuses on promoting the sound and rapid development of SMEs in China.

**Scholars:** Should be management Doctors or Professors, and have published journals or books on SMEs.

**Entrepreneurs:** Should be “Chinese Outstanding Entrepreneur”, have own business for more than five years.

## APPENDIX 2:

### AHP --- Pair-Wise Comparison Matrix

<b>Growth Capability</b>	Solvency Capability	Operation Capability	Profit Capability	Innovation Capability	HR Capability	Insight Capability	Business Confidence Index	Eigenvalue (Weight)
Solvency Capability	1	1	1/2	2/5	1	2/3	2/3	0.10
Operation Capability	1	1	1/2	2/5	1	2/3	2/3	0.10
Profit Capability	2	2	1	4/5	2	4/3	4/3	0.19
Innovation Capability	5/2	5/2	5/4	1	5/2	5/3	5/3	0.24
HR Capability	1	1	1/2	2/5	1	2/3	2/3	0.10
Insight Capability	3/2	3/2	3/4	3/5	3/2	1	1	0.14
Business Confidence Index	3/2	3/2	3/4	3/5	3/2	1	1	0.14

<b>Solvency Capability</b>	Gearing Ratio	Cash Ratio	Eigenvalue (Weight)
Gearing Ratio	1	1/2	0.33
Cash Ratio	2	1	0.67

<b>Operation Capability</b>	Total Assets Turnover	Accounts Receivable turnover	Inventory Turnover	Eigenvalue (Weight)
Total Assets Turnover	1	2	2	0.50
Accounts Receivable turnover	1/2	1	1	0.25
Inventory Turnover	1/2	1	1	0.25

<b>Profit Capability</b>	Net Profit Margin	Profit Per Employee	Eigenvalue (Weight)
Net Profit Margin	1	1	0.50
Profit Per Employee	1	1	0.50

<b>Innovation Capability</b>	Innovation Input Ratio	Net Income Growth Rate	Eigenvalue (Weight)
Innovation Input Ratio	1	1/2	0.33
Net Income Growth Rate	2	1	0.67

<b>HR Capability</b>	Training & Development Input Ratio	Employee Turnover Rate	Eigenvalue (Weight)
Training & Development Input Ratio	1	1	0.5
Employee Turnover Rate	1	1	0.5

<b>Insight Capability</b>	ICT Input Ratio	Networking Intensity	Eigenvalue (Weight)
ICT Input Ratio	1	1/2	0.33
Networking Intensity	2	1	0.67

### APPENDIX 3:

Collected data and calculated values of 148 Chinese SMEs for 2012

Company Name	Time to establish	Asset	No. of Staff	Gearing Ratio	Cash Ratio	Asset Turnover	Accounts Receivable Turnover (times)	Inventory Turnover (times)	Net Profit Margin	Profit Per Employee (ten thousand yuan)	Innovation Input Ratio	Net Income Growth Rate	Training and Development Input Ratio	Employees' Turnover Rate	ICT Input Ratio	Networking Intensity	Business Climate Index	
				Total liability/Total assets	(cash+cash equivalents)/current liabilities	Sales/Total assets	Net credit sales/Average Accounts Receivable	Sales/inventory	Net income/Sales	Sales/number of employees	Innovation Input/Sales	Net income growth/previous net income	Training and Development input/sales	Number of separations/average of employees	ICT input/sales	Section 4.2	Source: government	
1	山西宇狮环保科技有限公司	1991	100	10	100/1000=10%	200/100=2	600/1000=60%	600/100=6	600/100=6	42/600=7%	600/10=60	1%	2%	10%	10%	0	10	128
2	山西泰利福机电技术有限公司	2002	1000	120	700/5000=14%	800/600=1.33	4000/5000=80%	9000/900=10	9000/1000=9	900/9000=10%	9000/120=75	1%	2%	10%	10%	0.6%	30	119.5
3	晋城市润宏新能源发电股份有限公司	2008	5000	300	4500/35000=12.9%	2500/1500=1.67	12000/35000=34.3%	12000/4000=3	12000/5000=2.4	684/12000=5.7%	12000/300=40	2%	8%	1%	26%	0.4%	30	121.5
4	山西滋氏铸业有限公司	1994	6000	140	1500/16000=9%	1500/1000=1.5	14000/16000=87.5%	14000/1000=14	14000/2000=7	2632/14000=18.8%	14000/140=100	4%	15%	1%	25%	2%	40	120.6
5	开封市黄河钢结构有限公司	1994	800	19	500/3000=16.7%	200/300=66.7%	1300/3000=43.3%	1300/325=4	1300/400=3.25	113.1/1300=8.7%	1300/19=68.4	1.20%	3%	3%	18%	10%	80	125.6
6	富晋精密工业有限公司	1999	5000	1400	24960/78000=32%	10000/20000=50%	154000/78000=1.97	154000/9600=16	154000/5000=30.8	29568/154000=19.2%	154000/1400=110	4%	13%	0.5%	28%	10%	80	124.4
7	美特好连锁超市有限公司	1994	10000	3750	40000/145000=27.6%	10000/18000=56%	300000/145000=2.07	300000/15000=20	300000/30000=10	41400/300000=13.8%	300000/3750=80	1.50%	6%	0.5%	28%	10%	80	122.8
8	山西凯翔凯宇科技有限公司	2009	2000	190	3000/5000=60%	600/2500=24%	8500/5000=1.7	8500/500=17	8500/800=10.6	510/8500=6%	8500/190=44.7	1%	2%	5%	15%	20%	90	137.9
9	河南商丘雨贝童岛针织内衣厂	2004	50	10	0%	x	50/50=1	50/5=10	50/5=10	10/50=20%	50/10=5	1.50%	6%	5%	15%	0	10	138
10	河南百特医疗设备有限公司	1994	100	55	0%	x	4000/1000=4	4000/100=40	0	400/4000=10%	4000/55=72.7	1%	2%	5%	15%	5%	50	115.9
11	平顶山煤矿机械厂	1968	1000	2000	7000/30000=23.3%	600/1000=60%	240000/300000=80%	240000/24000=10	240000/3000=8	72000/240000=30%	240000/2000=120	4%	13%	5%	15%	1%	40	105.6
12	开封市福生祥食品有限公司	2004	50	130	270/1000=27%	110/200=55%	6000/3000=2	6000/300=20	6000/200=30	402/6000=6.7%	6000/130=46.2	1%	1%	10%	10%	0.08%	30	107
13	山西世家酒家酒业有限公司	2000	1000	150	1500/5000=30%	530/1000=53%	12000/5000=2.4	12000/2000=6	12000/500=24	1440/12000=12%	12000/150=80	1%	1%	10%	10%	0	10	146
14	太原晋林塑料厂	1992	1000	400	700/1400=50%	150/500=30%	8000/10000=80%	8000/1000=8	8000/800=10	160/8000=2%	8000/400=20	0.50%	0%	2%	12%	0.6%	30	139.4



15	许昌华兴电子产品有限公司	1998	1900	260	1500/10000=15%	1000/1000=1	5000/10000=50%	5000/1000=5	5000/1000=5	100/5000=2%	5000/260=19.2	0.80%	2%	3%	14%	0	10	94.6
16	山西省长治市潞酒有限公司	1989	1000	65	1500/10000=15%	1100/1000=1.1	5500/10000=55%	5500/1000=5.5	5500/1100=5	781/5500=14.2%	5500/65=84.6	0.90%	2%	5%	15%	0.18%	10	90
17	河南京豫药业有限公司	1995	1000	215	2000/20000=10%	1050/500=2.1	14000/20000=70%	14000/2000=7	14000/2000=7	1050/14000=7.5%	14000/215=65.1	0.50%	1%	3%	18%	0.07%	10	102.4
18	河南中港国际物流有限公司	2007	700	75	1463/4878=30%	795/1500=53%	9000/5000=1.8	9000/450=20	0	2700/9000=30%	9000/75=120	1.50%	6%	5%	15%	0.50%	30	108.2
19	河南维特瑞机械设备有限公司	2012	100	9	0%	x	600/2000=30%	600/200=3	600/1000=0.6	60/600=10%	600/9=66.7	1.30%	3%	3%	18%	0.83%	30	113.5
20	河南省宇阳市政府工程有限公司	2006	620	50	0%	x	7000/4500=1.7	7000/500=14	7000/700=10	2331/7000=33.3%	7700/50=154	1.40%	4%	1%	22%	0	10	128
21	河南大豆商贸有限公司	2009	220	150	100/300=33.3%	41/80=51.2%	1200/600=2	1200/80=15	1200/100=12	20.4/1200=1.7%	1200/150=8	1.50%	3%	2%	12%	0.40%	20	119.5
22	河南博信汽车销售服务有限公司	2011	2000	50	1700/3000=56.7%	400/1200=33.3%	5750/3000=1.9	5750/410=14	5750/500=11.5	1437.5/5750=25%	5750/50=115	1.50%	5%	10%	10%	1.70%	40	105.6
23	晋城市陶然一号餐饮服务有限公司	2011	100	10	240/700=34.3%	85/240=35.4%	600/700=85.7%	600/80=7.5	600/90=6.67	42.6/600=7.1%	600/10=60	0.50%	1%	0.8%	25%	1.70%	40	107
24	晋城市中开电梯设备有限公司	2005	1000	10	200/1000=20%	95/150=63.3%	750/1000=75%	750/90=8.3	0	112.5/750=15%	750/10=75	0%	0%	2%	12%	0	10	146
25	北京晋琪瑞光商贸有限公司	2012	250	5	150/250=60%	36/110=32.7%	500/250=2	500/25=20	500/25=20	100/500=20%	500/5=100	5%	18%	0.4%	35%	1%	40	139.4
26	和平汽修	1992	30	4	30/100=30%	16/30=53.3%	150/100=1.5	150/10=15	150/12=12.5	7.5/150=5%	150/4=37.5	0.20%	0%	0	40%	0	10	124.4
27	北京典时诚金教育咨询有限公司	2012	100	10	0	x	500/600=83.3%	0	0	41.5/500=8.3%	500/10=50	6%	20%	8%	11%	1%	40	122.8
28	中星信息服务有限公司	2007	100	15	0	x	700/1000=70%	700/100=7	0	52.5/700=7.5%	700/15=46.7	1%	2%	15%	6%	10%	80	137.9
29	晋城市济柴商贸有限公司	2008	1000	30	200/1000=20%	115/180=63.9%	1400/7000=20%	1400/1000=1.4	0	99.4/1400=7.1%	1400/30=46.7	1.80%	7%	0	40%	0.40%	20	138
30	北京巴吉特工程咨询服务公司	2000	1000	20	300/1000=30%	150/300=50%	800/1000=80%	800/100=8	800/90=8.89	40/800=5%	800/20=40	0.10%	0	4%	16%	3%	40	138
31	<b>北京燕化工程建设公司</b>	<b>1969</b>	<b>5000</b>	<b>78</b>	<b>1380/5000=27.6%</b>	<b>700/1250=56%</b>	<b>2250/5000=45%</b>	<b>2250/560=4.02</b>	<b>2250/550=4.1</b>	<b>67.5/2250=3%</b>	<b>2250/78=28.8</b>	<b>0.50%</b>	<b>0%</b>	<b>1%</b>	<b>25%</b>	<b>1%</b>	<b>40</b>	<b>105.6</b>
32	<b>北京华昌丰技术有限公司</b>	<b>1994</b>	<b>5000</b>	<b>12</b>	<b>2300/5000=46%</b>	<b>740/2000=37%</b>	<b>4000/5000=80%</b>	<b>4000/500=8</b>	<b>4000/400=10</b>	<b>1200/4000=30%</b>	<b>1500/12=125</b>	<b>5%</b>	<b>15%</b>	<b>1%</b>	<b>28%</b>	<b>8%</b>	<b>80</b>	<b>105.6</b>
33	谦豹网络科技有限公司	2000	100	5	22/100=22%	13.2/22=60%	60/100=60%	60/10=6	60/10=6	0.6/60=1%	60/5=12	0.30%	1%	0.1%	35%	0.45%	20	107
34	上海山钢实业有限公司	2003	10000	3500	40000/140000=28.6%	9900/18000=55%	300000/140000=2.14	300000/16000=18.75	300000/32000=9.4	42900/300000=14.3%	300000/3500=85.7	1.40%	5.80%	0.60%	26%	9%	80	146
35	浙江江红电器有限公司	2010	5000	160	4000/35000=11.4%	3000/1500=2	11000/35000=31.4%	11000/4000=2.75	11000/5000=2.2	946/11000=8.6%	11000/160=68.6	1.90%	9%	1%	27%	1.70%	40	98.5
36	衡水宏基橡塑有限公司	2011	5000	103	1000/5000=20%	620/1000=62%	7500/5000=1.5	7500/500=15	7500/620=12.1	750/7500=10%	7500/103=72.8	1.30%	4%	1%	28%	2%	40	128
37	石家庄五龙制动器股份有限公司	2003	5000	93	2500/5000=50%	600/2000=30%	4000/5000=80%	4000/400=10	4000/500=8	240/4000=6%	4000/93=43	1%	2%	10%	10%	0.60%	30	119.5

38	厦门思航纳米科技有限公司	2010	2000	7	600/2000=30%	260/500=52%	800/2000=40%	800/200=4	800/240=3.33	160/800=20%	800/7=114.3	6.50%	22%	15%	5%	10%	80	121.5
39	浙江京红电器有限公司	2004	5000	34	1000/8000=12.5%	1400/800=1.75	4000/8000=50%	4000/800=5	4000/800=5	1200/4000=30%	4000/34=117.6	1%	2%	5%	15%	5%	50	120.6
40	宁波清珠电器有限公司	2005	4000	52	3500/10000=35%	1530/3000=51%	6000/10000=60%	6000/1000=6	6000/1050=5.71	1500/6000=25%	6000/52=115.4	1.70%	6.20%	3%	18%	2%	40	125.6
41	北京爱百年文化艺术中心	2008	1000	8	560/2000=28%	280/500=56%	600/2000=30%	600/200=3	600/600=1	60/600=10%	600/8=75	1.80%	7%	5%	15%	10%	80	124.4
42	杭州新世纪美容健身有限公司	2004	100	15	100/1000=10%	180/100=1.8	700/1000=70%	700/100=7	700/90=7.8	52.5/700=7.5%	700/15=46.7	1%	2%	8%	11%	0.50%	30	122.8
43	杭州伟杰装饰材料有限公司	2003	1000	72	700/5000=14%	800/600=1.33	9000/5000=1.8	9000/450=20	9000/500=18	2700/9000=30%	9000/72=125	4%	13%	15%	6%	0.83%	30	137.9
44	重庆市成瑞测控仪表厂	2001	5000	275	4500/35000=12.9%	2600/1500=1.73	11000/35000=31.4%	11000/4000=2.75	11000/5000=2.2	627/11000=5.7%	11000/275=40	0.20%	1%	0	40%	0	10	138
45	重庆北碚三力玻璃制品有限公司	2005	6000	120	1500/16000=9%	1500/1000=1.5	10000/16000=62.5%	10000/1600=6.25	10000/1600=6.25	1250/10000=12.5%	10000/120=83.3	0.40%	1%	4%	16%	0.40%	20	115.9
46	重庆博迪机电有限责任公司	2011	800	34	500/3000=16.7%	200/300=66.7%	5750/3000=1.9	5750/410=14	5750/500=11.5	500.25/5750=8.7%	5750/84=68.5	0%	0%	6%	14%	1.70%	40	105.6
47	常熟市尚湖镇雅姿商业设备厂	2012	5000	360	24960/78000=32%	10000/20000=50%	30000/78000=38.4%	30000/7500=4	30000/8000=3.75	3840/30000=12.8%	30000/360=83.3	1%	2%	1%	26%	1.70%	40	107
48	常熟市君达服饰有限公司	2010	10000	1180	40000/145000=27.6%	9900/18000=55%	14000/14500=96.6%	140000/15500=9.03	140000/15000=9.33	38640/140000=27.6%	140000/1180=119	1.10%	2%	0.1%	35%	0	10	146
49	上海佳吉劳保用品有限公司	2000	2000	31	3000/5000=60%	600/2500=24%	2250/5000=45%	2250/560=4.02	2250/550=4.1	225/2250=10%	2250/31=72.6	0.30%	1%	0.6%	26%	1%	40	139.4
50	上海武迪贸易有限公司	2005	1000	55	1500/5000=30%	530/1000=53%	4000/5000=80%	4000/400=10	4000/500=8	400/4000=10%	4000/55=72.7	0.20%	1%	5%	15%	0.18%	10	94.6
51	上海联蓝教育	2011	1000	90	700/1400=50%	150/500=30%	6000/10000=60%	6000/1000=6	6000/1000=6	480/6000=8%	6000/90=66.7	1.50%	5.80%	3%	18%	0.07%	10	90
52	云霄县礁美台胞服务中心	2012	1900	56	1500/10000=15%	1000/1000=1	3000/10000=30%	3000/1000=3	3000/3000=1	150/3000=5%	3000/56=53.6	2.20%	9%	5%	15%	0.50%	30	107
53	普洛斯项目管理咨询有限公司	2010	1000	107	1500/10000=15%	1100/1000=1.1	5000/10000=50%	5000/1000=5	5000/1000=5	375/5000=7.5%	5000/107=46.7	1.40%	4%	3%	18%	0.83%	30	146
54	石家庄原动力信息咨询有限公司	2000	1000	117	2000/20000=10%	1050/500=2.1	8000/20000=40%	8000/2000=4	8000/2400=3.33	688/8000=8.6%	8000/117=68.4	1%	2%	1%	22%	1%	40	139.4
55	济南号召环保科技有限公司	1998	1000	26	1500/5000=30%	530/1000=53%	3000/5000=60%	3000/500=6	3000/600=5	600/3000=20%	3000/26=115.3	2.10%	9%	5%	15%	2%	40	94.6
56	济南新新城实业有限公司	1999	1000	450	700/1400=50%	150/500=30%	2800/1400=2	2800/140=20	2800/280=10	28/2800=1%	2800/450=6.2	1.40%	4%	3%	18%	10%	80	90
57	通化华翔置业投资有限公司	1999	1900	70	1500/10000=15%	1000/1000=1	5000/10000=50%	5000/1000=5	5000/1000=5	500/5000=10%	5000/70=71.4	1%	2%	5%	15%	10%	80	139.4
58	蓬莱市志宏电器照明有限公司	2000	1000	35	1500/10000=15%	1100/1000=1.1	4000/10000=40%	4000/1000=4	4000/1200=3.33	1000/4000=25%	4000/35=114.3	6.50%	22%	3%	18%	10%	80	124.4
59	山东亿辰电子有限公司	2001	1000	150	2000/20000=10%	1050/500=2.1	7000/20000=35%	7000/2300=3.04	7000/2900=2.4	525/7000=7.5%	7000/150=46.7	1%	2%	1%	22%	20%	90	122.8
60	广州番禺大石宏塑料五金模具制品厂	2005	1000	67	200/1000=20%	115/180=63.9%	800/1000=80%	800/80=10	800/100=8	8/800=1%	800/67=11.9	0.20%	1%	1%	22%	0.18%	10	137.9


61	广州佳色伊服饰有限公司	2011	1000	120	300/1000=30%	150/300=50%	600/1000=60%	600/100=6	600/100=6	4/600=0.67%	600/120=5	0.30%	1%	5%	15%	0.07%	10	138
62	张家港市唐艺和凤装饰材料有限公司	2012	1900	36	1250/5000=25%	725/1250=58%	2000/5000=40%	2000/500=4	2000/600=3.33	100/2000=5%	2000/36=55.6	0%	0%	3%	18%	0.50%	30	138
63	上海穗恒物流有限公司	2010	1000	21	2250/5000=45%	800/2250=35.6%	1000/5000=20%	1000/700=1.4	1000/800=1.25	75/1000=7.5%	1000/21=47.6	1%	2%	5%	15%	0.83%	30	115.9
64	富阳市胥口镇高峰五金厂	2000	1000	5	220/1000=22%	132/222=60%	350/1000=35%	350/115=3.04	350/145=2.4	31.5/350=9%	350/5=70	1%	2%	3%	18%	0	10	105.6
65	阳江市玉沙小刀厂	2003	1000	162	270/1000=27%	110/200=55%	1000/1000=1	1000/100=10	1000/100=10	10/1000=1%	1000/162=6.2	0.50%	1%	1%	26%	1.70%	40	107
66	阳江市毅南五金制品有限公司	2001	1000	500	200/1000=20%	115/180=63.9%	700/1000=70%	700/100=7	700/90=7.8	0/700=0	700/500=1.4	0.20%	0%	0.1%	35%	0	10	146
67	阳东县昌信工贸有限公司	2005	1000	40	200/1000=20%	95/150=63.3%	800/1000=80%	800/80=10	800/100=8	16/800=2%	800/40=20	1%	2%	0.6%	26%	1%	40	98.5
68	阳江市百隆金塑制品有限公司	2011	1000	4	100/1000=10%	200/100=2	300/1000=30%	300/100=3	300/300=1	30/300=10%	300/4=75	1%	2%	5%	15%	0.18%	10	128
69	永康市杰力工具有限公司	1998	1000	420	2000/20000=10%	1050/500=2.1	5000/20000=40%	5000/1250=4	5000/1500=3.33	50/5000=1%	5000/420=11.9	1.20%	2%	3%	18%	2%	40	119.5
70	永康市信阳机械制造有限公司	1999	1000	7	200/1000=20%	115/180=63.9%	500/1000=50%	500/100=5	500/100=5	50/500=10%	500/7=71.4	1.10%	2%	5%	15%	10%	80	121.5
71	永康市康家五金厨具厂	1999	1000	14	300/1000=30%	150/300=50%	800/1000=80%	800/80=10	800/100=8	50/800=6.25%	800/14=57.1	0.40%	1%	8%	11%	10%	80	120.6
72	永康市泉湖翔博电器厂	2000	1900	34	1250/5000=25%	725/1250=58%	2250/5000=45%	2250/560=4.02	2250/550=4.1	180/2250=8%	2250/34=66.2	0%	0%	15%	6%	10%	80	125.6
73	永康市强龙健身器材厂	2001	1000	15	2250/5000=45%	800/2250=35.6%	1000/5000=20%	1000/700=1.4	1000/800=1.25	86/1000=8.6%	1000/15=66.7	1%	2%	0	40%	20%	90	124.4
74	永康市立阳工具厂	2005	1000	9	220/1000=22%	132/222=60%	1000/1000=1	1000/100=10	1000/100=10	200/1000=20%	1000/9=111.1	0.60%	1%	1%	22%	0.50%	30	122.8
75	永康市东城科升电动车配件厂	2011	1000	13	270/1000=27%	110/200=55%	600/1000=60%	600/100=6	600/120=5	45/600=7.5%	600/13=46.2	0.20%	1%	5%	15%	0.83%	30	115.9
76	厦门市铭利兴电子科技有限公司	2012	1000	100	200/1000=20%	115/180=63.9%	2000/1000=2	2000/100=20	2000/200=10	40/2000=2%	2000/100=20	1.40%	5.80%	3%	18%	0	10	105.6
77	永康市好利德休闲用品有限公司	2010	1000	14	200/1000=20%	95/150=63.3%	550/1000=55%	550/100=5.5	550/110=5	22/550=4%	550/14=39.3	2.20%	9%	5%	15%	1.70%	40	107
78	永康市赛弗滤芯有限公司	2000	1000	8	100/1000=10%	200/100=2	700/1000=70%	700/100=7	700/90=7.8	100/700=14.3%	700/8=87.5	1.40%	4%	3%	18%	0	10	146
79	广州德广进出口贸易有限公司	1999	2000	44	3000/5000=60%	600/2500=24%	2500/5000=50%	2500/500=5	2500/500=5	150/2500=6%	2500/44=56.8	0%	0%	1%	22%	1%	40	98.5
80	北京市中伦金通律师事务所深圳分所	1999	1000	14	1500/5000=30%	530/1000=53%	1000/5000=20%	1000/700=1.4	1000/800=1.25	100/1000=10%	1000/14=71.4	6%	20%	5%	15%	2%	40	128
81	广州礼友礼品有限公司	2000	1000	14	700/1400=50%	150/500=30%	840/1400=60%	840/140=6	840/168=5	52.5/840=6.25%	840/14=60	1%	2%	3%	18%	10%	80	105.6
82	广州市泓宜商贸有限公司	2001	1900	65	1500/10000=15%	1000/1000=1	4300/10000=43%	4300/1075=4	4300/1080=3.98	344/4300=8%	4300/65=66.2	1.80%	7%	5%	15%	2%	40	107
83	苍南县龙港精彩工艺品厂	2005	1000	67	1500/10000=15%	1100/1000=1.1	4500/10000=45%	4500/1122=4.01	4500/1100=4.09	387/4500=8.6%	4500/67=67.2	0%	0	3%	18%	10%	80	146

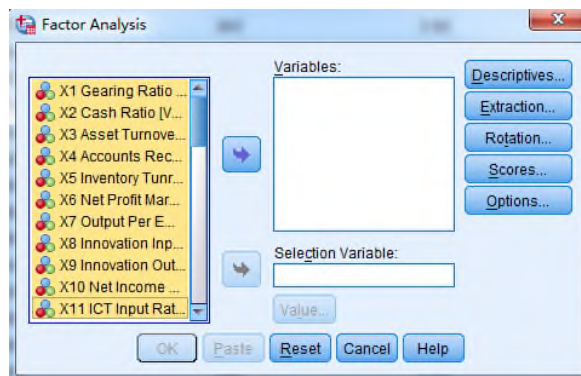
84	上海国煌商贸发展有限公司	2011	1000	54	2000/20000=10%	1050/500=2.1	6000/20000=30%	6000/2000=3	6000/6000=1	1200/6000=20%	6000/54=111.1	4.20%	16%	1%	22%	10%	80	139.4
85	温州市益彰贸易有限公司	2012	1000	108	1500/5000=30%	530/1000=53%	5000/5000=1	5000/500=10	5000/500=10	375/5000=7.5%	5000/108=46.3	8%	24%	1%	22%	0.18%	10	94.6
86	深圳市丰盛人生信息咨询有限公司	2010	1000	56	700/1400=50%	150/500=30%	1120/1400=80%	1120/140=8	1120/140=8	22.4/1120=2%	1120/56=20	0.30%	1%	5%	15%	0.07%	10	90
87	深圳市朴丰实业发展有限公司	2003	1900	178	1500/10000=15%	1000/1000=1	7000/10000=70%	7000/1000=7	7000/1000=7	280/7000=4%	7000/178=39.3	1.40%	5.80%	3%	18%	0.50%	30	102.4
88	深圳市金兰家政服务有限公司	2001	2000	11	1700/3000=56.7%	400/1200=33.3%	1000/3000=33.3%	1000/335=2.99	1000/340=2.94	143/1000=14.3%	1000/11=90.9	1%	2%	5%	15%	0.83%	30	108.2
89	佛山市顺德区艾利特电源有限公司	2003	1000	10	270/1000=27%	110/200=55%	550/1000=55%	550/100=5.5	550/110=5	27.5/550=5%	550/10=55	1%	2%	5%	15%	0.18%	10	113.5
90	佛山市南海里水贵皇鞋厂	2001	1000	8	200/1000=20%	115/180=63.9%	600/1000=60%	600/100=6	600/120=5	60/600=10%	600/8=75	1%	2%	3%	18%	0.07%	10	128
91	佛山市南海乔国电子科技有限公司	2005	1000	100	200/1000=20%	95/150=63.3%	2000/1000=2	2000/100=20	2000/200=10	40/2000=2%	2000/100=20	2%	8%	5%	15%	0.50%	30	119.5
92	佛山市利庆阻燃科技有限公司	2011	1000	16	100/1000=10%	200/100=2	750/1000=75%	750/90=8.3	750/85=8.8	50/750=6.7%	750/16=46.9	4.10%	15%	8%	11%	0.83%	30	105.6
93	佛山城达装饰材料商行	1998	1000	195	2000/20000=10%	1050/500=2.1	9520/20000=47.6%	9520/2115=4.5	9520/2115=4.5	700/9250=7.6%	9250/195=47.4	1.20%	3%	1%	22%	1%	40	107
94	辰丰日用杂品有限公司	1999	1000	6	200/1000=20%	115/180=63.9%	600/1000=60%	600/100=6	600/100=6	108/600=18%	600/6=100	0.60%	1%	1%	22%	2%	40	146
95	江西天云电子科技有限公司	1999	1000	36	300/1000=30%	150/300=50%	4000/1000=4	4000/100=40	4000/100=40	800/4000=20%	4000/36=111.1	0.60%	1%	5%	15%	10%	80	98.5
96	宜春市荣利源服装有限公司	2000	1900	67	1250/5000=25%	725/1250=58%	5000/5000=1	5000/500=10	5000/500=10	750/5000=15%	5000/67=74.6	1.40%	5.80%	3%	18%	1.70%	40	108.2
97	江西省丰城市顺达五金制品厂	2001	1000	25	2250/5000=45%	800/2250=35.6%	1000/5000=20%	1000/700=1.4	1000/800=1.25	40/1000=4%	1000/25=40	2.20%	9%	4%	16%	2%	40	113.5
98	上海珂隆五金有限公司	2005	1000	13	220/1000=22%	132/222=60%	800/1000=80%	800/100=8	800/90=8.89	56/800=7%	800/13=61.5	1.40%	4%	6%	14%	0.60%	30	128
99	南通金品来纺织品有限公司	2005	1000	10	100/1000=10%	200/100=2	800/1000=80%	800/100=8	800/90=8.89	100/800=12.5%	800/10=80	1%	2%	3%	18%	0.50%	30	119.5
100	淮安市盛威织造有限公司	2011	1000	44	700/5000=14%	800/600=1.33	2000/5000=40%	5000/1250=4	5000/1500=3.33	1000/5000=20%	5000/44=113.6	1%	2%	1%	22%	0.83%	30	105.6
101	常州市武进区横林汇通地板厂	2012	1000	18	500/3000=16.7%	200/300=66.7%	1000/3000=33.3%	1000/300=3.3	1000/350=2.86	50/1000=5%	1000/18=55.6	0.20%	0	1%	22%	0.18%	10	107
102	淄博轩皓经贸有限公司	2010	1000	13	270/1000=27%	110/200=55%	1000/1000=1	1000/100=10	1000/100=10	100/1000=10%	1000/13=76.9	0.20%	1%	5%	15%	0.07%	10	146
103	台州昱升印务有限公司	2000	1000	125	1500/5000=30%	530/1000=53%	2500/5000=50%	2500/500=5	2500/500=5	50/2500=2%	2500/125=20	0.10%	1%	3%	18%	0.50%	30	98.5
104	温岭市立阳网络器材有限公司	1999	1000	12	700/1400=50%	150/500=30%	300/1400=21.4%	1400/875=1.6	1400/875=1.6	300/1400=21.4%	1400/12=116.7	0.20%	1%	5%	15%	20%	90	128
105	台州百瑞电子科技有限公司	1999	1000	43	1700/3000=56.7%	400/1200=33.3%	2000/3000=66.7%	2000/295=6.79	2000/300=6.67	150/2000=7.5%	2000/43=46.5	0%	0%	5%	15%	0.50%	30	105.6
106	乐清市正控气动液压成套有限公司	2000	1900	5	200/1000=20%	95/150=63.3%	550/1000=55%	550/100=5.5	550/110=5	100/550=18.2%	550/5=110	1%	2%	3%	18%	0.83%	30	107

107	苍南县振荣无纺布厂	2001	1000	16	200/1000=20%	115/180=63.9%	750/1000=75%	750/90=8.3	750/90=8.3	50/750=6.7%	750/16=46.9	1%	2%	5%	15%	0	10	146
108	温州市瓯海梧田胜奥弹簧机械厂	2005	1000	11	300/1000=30%	150/300=50%	700/1000=70%	700/100=7	700/90=7.8	50/700=7.1%	700/11=63.6	1.30%	4%	8%	11%	1.70%	40	139.4
109	永康市洁霸日用五金厂	2011	1000	11	200/1000=20%	115/180=63.9%	500/1000=50%	500/100=5	500/100=5	33.5/500=6.7%	500/11=45.5	1%	2%	3%	18%	20%	90	94.6
110	武汉怡安座椅厂	2012	1000	10	300/1000=30%	150/300=50%	300/1000=30%	300/100=3	300/200=1.5	10/300=3.3%	300/10=30	1%	2%	5%	15%	1.70%	40	90
111	云南天之泰律师事务所	2010	1000	65	1250/5000=25%	725/1250=58%	5000/5000=1	5000/500=10	5000/500=10	500/5000=10%	5000/65=76.9	0.10%	0	15%	6%	10%	80	102.4
112	醴陵恒达烟花有限公司	2000	1000	15	2250/5000=45%	800/2250=35.6%	1000/5000=20%	1000/700=1.4	1000/800=1.25	87/1000=8.7%	1000/15=66.7	0.20%	1%	1%	22%	2%	40	108.2
113	江门蓬江区亚美家五金卫厨有限公司	1999	1000	10	220/1000=22%	132/222=60%	800/1000=80%	800/100=8	800/90=8.89	100/800=12.5%	800/10=80	0.30%	1%	6%	14%	0.07%	10	113.5
114	深圳市深保源贸易有限公司	2000	1000	25	540/3000=18%	195/300=65%	1000/3000=33.3%	1000/300=3.3	1000/350=2.86	40/1000=4%	1000/25=40	1%	2%	3%	18%	0.18%	10	128
115	深圳市医诺尔科技发展有限公司	2001	1000	39	3000/5000=60%	600/2500=24%	3500/5000=70%	3500/500=7	3500/450=7.8	500/3500=14.3%	3500/39=89.7	1.40%	4%	5%	15%	0.07%	10	119.5
116	深圳市英亿达科技发展有限公司	2005	1000	52	2250/5000=45%	800/2250=35.6%	4000/5000=80%	4000/500=8	4000/450=8.9	400/4000=10%	4000/52=76.9	1%	2%	3%	18%	0.50%	30	105.6
117	深圳市佳音信息咨询服务有限公司	2011	1900	13	220/1000=22%	132/222=60%	650/1000=65%	650/100=6.5	650/95=6.8	50/650=7.7%	650/13=50	1.10%	2%	1%	22%	0.83%	30	107
118	深圳市雨田实业有限公司零度网吧	2012	1000	6	270/1000=27%	110/200=55%	500/1000=50%	500/100=5	500/100=5	60/500=12%	500/6=83.3	0.30%	1%	6%	14%	1.70%	40	146
119	深圳市天之骄投资咨询有限公司	2010	1000	8	200/1000=20%	115/180=63.9%	200/1000=20%	200/140=1.4	200/125=1.6	5/200=2.5%	200/8=25	0.40%	1%	0	40%	20%	90	125.6
120	深圳市兆润祥实业有限公司	2000	1000	14	500/3000=16.7%	200/300=66.7%	1300/3000=43.3%	1300/325=4	1300/310=4.19	200/1300=15.3%	1300/14=92.9	2.10%	9%	0.1%	35%	1.70%	40	124.4
121	深圳市旭日精工机械有限公司	1999	1000	6	270/1000=27%	110/200=55%	350/1000=35%	350/100=3.5	350/100=3.5	17.5/350=5%	350/6=58.3	1%	2%	0.6%	26%	10%	80	122.8
122	深圳市佳兴达实业有限公司	2000	1000	24	540/3000=18%	195/300=65%	1100/3000=36.7%	1100/295=3.73	1100/300=3.67	80/1100=7.3%	1100/24=45.8	0.20%	1%	8%	11%	0.07%	10	137.9
123	深圳市益盛饮品有限公司莲塘专卖店	1999	1000	18	600/2000=30%	260/500=52%	1200/2000=60%	1200/200=6	1200/240=5	100/1200=8.3%	1200/18=66.7	0.20%	1%	3%	18%	1%	40	138
124	深圳市银峰机械设备有限公司	2011	1000	29	500/3000=16.7%	200/300=66.7%	1000/3000=33.3%	3000/910=3.3	3000/900=3.3	500/3000=16.7%	3000/29=103.4	0.20%	1%	1%	22%	0.18%	10	115.9
125	深圳市嘉德信投资咨询有限公司	2012	1000	65	1500/5000=30%	530/1000=53%	3000/5000=60%	5000/830=6.02	5000/830=6.02	500/5000=10%	5000/65=76.9	0.10%	1%	5%	15%	0.07%	10	105.6
126	深圳市润盈实业有限公司	2010	1000	11	700/1400=50%	150/500=30%	700/1400=50%	700/140=5	700/135=5.2	50/700=7.1%	700/11=63.6	1%	2%	3%	18%	0.50%	30	107
127	深圳市通伟亚服饰发展有限公司	2000	1000	17	220/1000=22%	132/222=60%	800/1000=80%	800/100=8	800/90=8.89	60/800=7.5%	800/17=47.1	1.40%	4%	0.6%	26%	0.83%	30	107
128	深圳市丰盛人生信息咨询有限公司	1999	1000	36	1700/3000=56.7%	400/1200=33.3%	2000/3000=66.7%	2000/295=6.79	2000/300=6.67	100/2000=5%	2000/36=55.6	1.60%	5.80%	15%	6%	20%	90	146
129	深圳桑达电子总公司	2011	1000	50	1500/5000=30%	530/1000=53%	1500/3000=50%	1500/300=5	1500/300=5	50/1500=3.3%	1500/50=30	0.20%	1%	10%	10%	3%	40	139.4

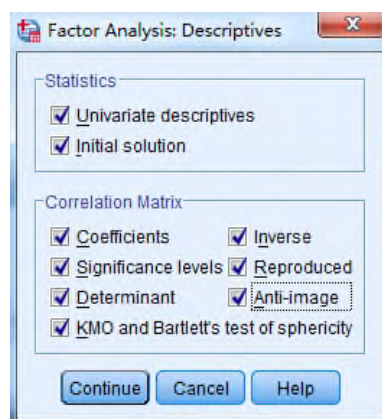
130	深圳市好生活送菜服务有限公司	2012	1000	5	700/1400=50%	150/500=30%	500/1400=35.7%	500/140=3.57	500/135=3.7	80/500=16%	500/5=100	1%	2%	1%	26%	5%	50	94.6
131	深圳市罗湖区金美装饰制作中心	2010	1000	84	1250/5000=25%	725/1250=58%	4000/5000=80%	4000/500=8	4000/450=8.9	300/4000=7.5%	4000/84=47.6	1.30%	4%	3%	18%	8%	80	90
132	深圳市华安行实业有限公司	2000	1000	32	2250/5000=45%	800/2250=35.6%	1500/5000=30%	1500/300=5	1500/280=5.4	100/1500=6.7%	1500/32=46.9	0.00%	0%	5%	15%	0.07%	10	102.4
133	深圳市庆顺达清洁服务有限公司	1999	1000	16	700/5000=14%	800/600=1.33	1200/5000=24%	1200/500=2.4	1200/500=2.4	120/1200=10%	1200/16=75	1%	2%	2%	12%	10%	80	108.2
134	深圳市心心皮具有限公司	2010	1000	13	270/1000=27%	110/200=55%	650/1000=65%	650/100=6.5	650/105=6.19	50/650=7.7%	650/13=50	0.20%	1%	1%	26%	0.50%	30	113.5
135	深圳市科知库办公自动化有限公司	2000	1000	6	200/1000=20%	115/180=63.9%	500/1000=50%	500/100=5	500/100=5	60/500=12%	500/6=83.3	0.20%	1%	3%	18%	1%	40	107
136	深圳市祥丰实业发展有限公司	1999	1000	5	200/1000=20%	95/150=63.3%	550/1000=55%	550/100=5.5	550/105=5.24	100/550=18.2%	550/5=110	1%	2%	5%	15%	5%	50	107
137	深圳市鑫森家政服务有限公司	2000	1000	7	100/1000=10%	200/100=2	400/1000=40%	400/100=4	400/110=3.6	25/400=6.25%	400/7=57.1	1.90%	9%	0.1%	35%	8%	80	146
138	广东汕头报关服务公司深圳分公司	1999	1000	50	2250/5000=45%	800/2250=35.6%	1500/5000=30%	1500/500=3	1500/600=2.5	50/1500=3.3%	1500/50=30	1.60%	5.80%	0.6%	26%	10%	80	139.4
139	深圳新安军辉纸箱包装机械配件部	1999	1000	16	500/3000=16.7%	200/300=66.7%	1200/3000=40%	1200/300=4	1200/350=3.4	120/1200=10%	1200/16=75	1%	2%	1%	26%	10%	80	94.6
140	深圳市恒开源贸易发展有限公司	2011	1000	18	300/2000=15%	250/250=1	1200/2000=60%	1200/200=6	1200/198=6.06	96/1200=8%	1200/18=66.7	0.20%	1%	3%	18%	0.18%	10	90
141	深圳市天雅纸业制品有限公司	2012	1000	12	300/1000=30%	150/300=50%	550/1000=55%	550/100=5.5	550/105=5.24	33/550=6%	550/12=45.8	0.40%	1%	5%	15%	3%	40	107
142	深圳市龙岗区平湖弘信五金塑胶行	2010	1000	18	1250/5000=25%	725/1250=58%	1000/5000=20%	1000/700=1.4	1000/800=1.25	50/1000=5%	1000/18=55.6	1%	2%	2%	12%	5%	50	146
143	深圳新亚洲电子市场鹏佳电子展销柜	2000	1000	81	2250/5000=45%	800/2250=35.6%	5000/5000=1	5000/500=10	5000/500=10	350/5000=7%	5000/81=61.7	2%	9%	1%	26%	1%	40	125.6
144	深圳市裕昌机电有限公司	1999	1000	25	220/1000=22%	132/222=60%	500/1000=50%	500/100=5	500/100=5	10/500=2%	500/25=20	1.60%	5.80%	0.1%	35%	5%	50	124.4
145	深圳市恒碧琉璃工艺品有限公司	2010	1000	56	1250/5000=25%	725/1250=58%	2250/5000=45%	2250/500=4.5	2250/500=4.5	120/2250=5.3%	2250/56=40.2	1.30%	4%	0.6%	26%	0	10	122.8
146	深圳市经富五金压铸制品厂	2000	1000	32	2250/5000=45%	800/2250=35.6%	1500/5000=30%	1500/500=3	1500/750=2	100/1500=6.7%	1500/32=46.9	0.10%	0%	10%	10%	2%	40	107
147	景德镇市锋美机械厂	1999	1000	18	700/1400=50%	150/500=30%	1200/1400=85.7%	1200/160=7.5	1200/155=7.7	100/1200=8.3%	1200/18=66.7	1%	2%	1%	26%	10%	80	107
148	滨州嘉瑞商贸有限公司	2000	1000	13	270/1000=28%	108/200=54%	650/1000=65%	650/100=6.5	650/100=6.5	50/650=7.7%	650/13=50	1.50%	8%	0.1%	35%	1%	40	146

## APPENDIX 4: EFA using SPSS

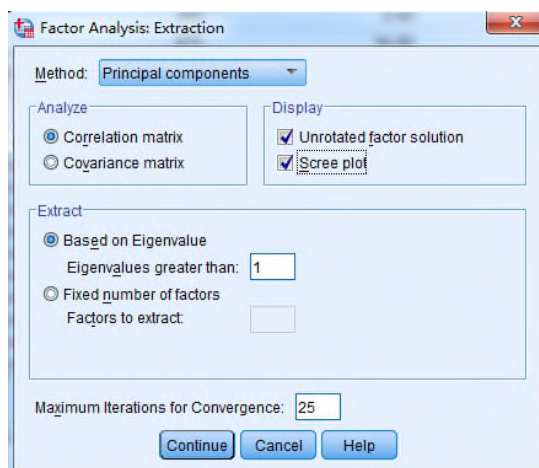
Access the main dialog box by using the Analyze → Dimension Reduction → Factor menu path. Simply select the 13 variables you want to include in the analysis and transfer them to the box labeled Variables by clicking on .



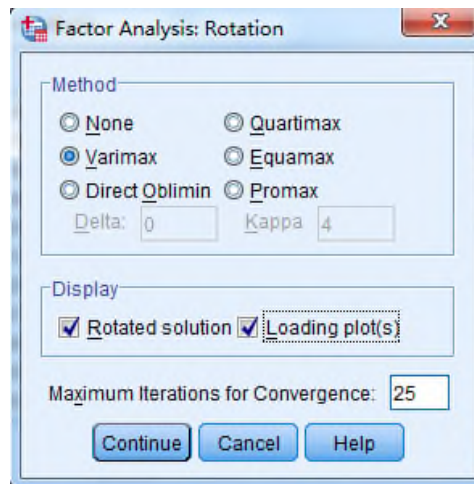
Click on Descriptive to access the KMO measure of sampling adequacy and Bartlett's test for determining if the data is suitable for EFA.



Click on Extraction to decide how many factors should be retained in an analysis by using eigenvalue > 1 rule.



Click on Rotation to improve the interpretability by maximizing the loading of each variable on one of the extracted factors whilst minimizing the loading on all other factors.





## APPENDIX 5: growth index (2012) and profit growth rate (2012~2014)

	Company Name	Calculated Growth Index for 2012	Actual Profit Growth Rate between 2012 and 2014
1	山西宇狮环保科技有限公司	-0.179413189	-0.12
2	山西泰利福机电技术有限公司	-0.030481614	-0.06
3	晋城市润宏新能源发电股份有限公司	-0.275307366	-0.16
4	山西滋氏铸业有限公司	0.576645685	0.20
5	开封市黄河钢结构有限公司	0.087500059	0.10
6	富晋精密工业有限公司	1.297561001	0.83
7	美特好连锁超市有限公司	0.5229747	0.10
8	山西凯翔凯宇科技有限公司	0.410634531	0.11
9	河南商丘雨贝童岛针织内衣厂	-0.254368732	-0.23
10	河南百特医疗设备有限公司	0.414909692	0.30
11	平顶山煤矿机械厂	0.764090107	0.40
12	开封市福生祥食业有限公司	0.06672867	0.08
13	山西世家酒家酒业有限公司	0.497026082	0.52
14	太原普林塑料厂	-0.258827749	-0.20
15	许昌华兴电子产品有限公司	-0.812230122	-1.10
16	山西省长治市潞酒有限公司	-0.454281685	0.10
17	河南京豫药业有限公司	-0.591619342	-0.32
18	河南中港国际物流有限公司	0.660019135	-0.10
19	河南维特瑞机械设备有限公司	-0.334484552	-0.30
20	河南省宇阳市政府工程有限公司	0.481230517	0.10
21	河南大昱商贸有限公司	-0.063393658	-0.09
22	河南博信汽车销售服务有限公司	0.571227981	0.10
23	晋城市陶然一号餐饮服务有限公司	-0.260573418	0.05
24	晋城市中开电梯设备有限公司	0.009146231	0.05
25	北京晋琪瑞光商贸有限公司	1.135982968	0.67
26	和平汽修	-0.347143784	-0.23
27	北京典时诚金教育咨询有限公司	0.72654925	0.67
28	中星信息服务有限公司	0.433648718	0.89
29	晋城市济柴商贸有限公司	-0.16433113	-0.10
30	北京巴吉特工程咨询服务公司	0.031105529	-0.06
31	北京燕化工程建设公司	-0.604915907	-0.60
32	北京华昌丰技术有限公司	1.152863468	0.80
33	谍豹网络科技有限公司	-0.783409976	-0.69
34	上海山钢实业有限公司	0.744093951	0.98
35	浙江京红电器有限公司	-0.279099785	0.05

	Company Name	Calculated Growth Index for 2012	Actual Profit Growth Rate between 2012 and 2014
36	衡水宏基橡塑有限公司	0.085799853	0.09
37	石家庄五龙制动器股份有限公司	-0.069461196	0.00
38	厦门思航纳米科技有限公司	1.815374783	1.68
39	浙江京红电器有限公司	0.295870174	0.40
40	宁波清珠电器有限公司	0.667173036	0.86
41	北京爱百年文化艺术中心	0.38480656	1.10
42	杭州新世纪美容健身有限公司	-0.203523814	0.05
43	杭州伟杰装饰材料有限公司	1.404833041	1.80
44	重庆市成瑞测控仪表厂	-0.568544098	-0.55
45	重庆北碚三力玻璃制品有限公司	-0.302537349	-0.28
46	重庆博迪机电有限责任公司	-0.198201144	-0.14
47	常熟市尚湖镇雅姿商业设备厂	-0.03001652	-0.06
48	常熟市君达服饰有限公司	0.388797718	0.65
49	上海佳吉劳保用品有限公司	-0.156431936	-0.09
50	上海武迪贸易有限公司	-0.338599792	-0.10
51	上海联蓝教育	-0.367873043	-0.35
52	云霄县礁美台胞服务中心	-0.20827498	-0.16
53	普洛斯项目管理咨询有限公司	-0.072479504	-0.09
54	石家庄原动力信息咨询有限公司	-0.174988827	-0.11
55	济南号召环保科技有限公司	0.362001633	0.62
56	济南新新城实业有限公司	-0.176777863	0.10
57	通化华翔置业投资有限公司	0.214924753	0.35
58	蓬莱市志宏电器照明有限公司	1.278634605	0.75
59	山东亿辰电子有限公司	-0.0532702	0.00
60	广州市番禺大石三宏塑料五金模具制品厂	-0.505740417	-0.50
61	广州佻色伊服饰有限公司	-0.244415521	-0.20
62	张家港市唐艺和凤装饰材料有限公司	-0.270045845	-0.24
63	上海穗恒物流有限公司	-0.178882372	-0.14
64	富阳市胥口镇高峰五金厂	-0.439827423	-0.46
65	阳江市玉沙小刀厂	-0.551337988	-0.54
66	阳江市毅南五金制品有限公司	-0.579060003	-0.15
67	阳东县昌信工贸有限公司	-0.624551405	-0.70
68	阳江市百隆金塑制品有限公司	-0.277134376	0.14
69	永康市杰力工具有限公司	-0.554612603	-0.55
70	永康市信阳机械制造有限公司	0.121623366	0.15

71	永康市康家五金厨具厂	0.321205918	0.58
72	永康市强龙健身器材厂	0.219259997	0.23
73	永康市立阳工具厂	0.076146554	0.35
74	永康市东城科升电动车配件厂	-0.290919114	0.05
75	厦门铭利兴电子科技有限公司	-0.334083008	-0.20
76	永康市好利德休闲用品有限公司	-0.115802434	-0.30
77	永康市赛弗滤芯有限公司	0.084820075	-0.10
78	广州德广进出口贸易有限公司	-0.623911439	0.09
79	北京市中伦金通律师事务所深圳分所	0.8655054	-0.69
80	广州礼友礼品有限公司	-0.084508627	1.20
81	广州市泓宣商贸有限公司	-0.135861262	-0.10
82	苍南县龙港精彩工艺品厂	0.058208429	0.01
83	上海国煌商贸发展有限公司	0.929481143	0.09
84	温州市益彰贸易有限公司	0.624747651	1.20
85	深圳市丰盛人生信息咨询有限公司	-0.7259799	0.90
86	深圳市朴丰实业发展有限公司	-0.421944385	-0.95
87	深圳市金兰家政服务有限公司	-0.125605566	0.03
88	佛山市顺德区艾利特电源有限公司	-0.326707066	-0.11
89	佛山市南海里水贵星鞋厂	-0.198687538	-0.30
90	佛山市南海乔国电子科技有限公司	-0.000792423	-0.32
91	佛山市利庆阻燃科技有限公司	0.23213018	0.00
92	佛山城达装饰材料商行	-0.472640162	0.38
93	辰丰日用杂品有限公司	0.170564937	-0.80
94	江西天云电子科技有限公司	0.932215294	0.15
95	宜春市荣利源服装有限公司	0.077918917	1.50
96	江西省丰城市顺达五金制品厂	0.040604686	0.09
97	上海珂隆五金有限公司	0.014189237	0.05
98	南通金品来纺织品有限公司	-0.181099325	0.01
99	淮安市盛威织造有限公司	-0.195799085	-0.12
100	常州市武进区横林汇通地板厂	-0.711496791	-0.13
101	淄博轩皓经贸有限公司	0.083824343	-0.71
102	台州昱升印务有限公司	-0.611630496	0.10
103	温岭市立阳网络器材有限公司	0.520869992	-0.70
104	台州百瑞电子科技有限公司	-0.43810782	0.70
105	乐清市正控气动液压成套有限公司	-0.082720947	-0.15
106	永康市泉湖翔博电器厂	0.335249256	-0.12
107	苍南县振荣无纺布厂	-0.09507177	-0.13
108	温州市瓯海梧田胜奥弹簧机械厂	0.411985951	0.60
109	永康市洁霸日用五金厂	-0.151792776	-0.12

110	武义怡安座椅厂	-0.400613293	-0.38
111	云南天之泰律师事务所	0.298602661	0.40
112	醴陵恒达烟花有限公司	-0.290240292	-0.18
113	江门市蓬江区亚美家五金卫浴有限公司	-0.209155331	-0.15
114	深圳市深保源贸易有限公司	-0.435868026	-0.20
115	深圳市医诺尔科技发展有限公司	-0.018215817	0.00
116	深圳市英亿达科技发展有限公司	-0.083660783	-0.11
117	深圳市佳音信息咨询服务有限公司	-0.410163427	-0.38
118	深圳市雨田实业有限公司零度网吧	0.199901552	0.11
119	深圳市天之骄投资咨询有限公司	-0.225886761	-0.14
120	深圳市兆源祥实业有限公司	0.173372712	0.20
121	深圳市旭日精工机械有限公司	-0.034774214	-0.06
122	深圳市佳兴达实业有限公司	-0.226203168	-0.12
123	深圳市益盛饮品有限公司莲塘专卖店	0.034516292	-0.06
124	深圳市银峰机械设备有限公司	-0.297810018	-0.19
125	深圳市嘉德信投资咨询有限公司	-0.280041028	-0.18
126	深圳市润盈实业有限公司	-0.330676528	-0.30
127	深圳市迪伟亚服饰发展有限公司	-0.333270884	-0.31
128	深圳市丰盛人生信息咨询有限公司	0.878446575	0.83
129	深圳桑达电子总公司	0.024179375	0.21
130	深圳市好生活送餐服务有限公司	-0.173828503	-0.12
131	深圳市罗湖区金金美术装饰制作中心	-0.148047804	-0.32
132	深圳市华安行实业有限公司	-0.462180859	0.00
133	深圳市庆顺达清洁服务有限公司	-0.106214445	-0.08
134	深圳市心皮具有限公司	-0.396521775	-0.04
135	深圳市科知库办公自动化有限公司	-0.294194763	0.13
136	深圳市祥丰实业发展有限公司	0.077218517	0.10
137	深圳市鑫森家政服务有限公司	0.252220366	0.00
138	广东汕头报关服务公司深圳分公司	0.23642289	0.35
139	深圳市宝安区新安军辉纸箱包装机械配件部	-0.242126656	-0.26
140	深圳市恒开源贸易发展有限公司	-0.696113609	-0.62
141	深圳市天雅纸业制品有限公司	-0.177191268	-0.12
142	深圳市龙岗区平湖弘信五金塑胶行	0.026223323	-0.01
143	深圳市新亚洲电子市场鹏佳电子展销柜	0.281403577	0.32
144	深圳市裕昌机电有限公司	-0.242339512	-0.10
145	深圳市恒碧琉璃工艺品有限公司	-0.375828323	-0.19
146	深圳市经富五金压铸制品厂	-0.18557292	-0.15
147	景德镇市锋美机械厂	-0.046482877	0.00
148	滨州嘉瑞商贸有限公司	0.203656631	0.24

