

VENTURE CAPITAL INVESTMENT IN CHINA:

Monitoring and Value-added

By Feng Li

**Submitted to the School of City and Planning in partial fulfilment of
the requirements for the award of Doctor of Philosophy**

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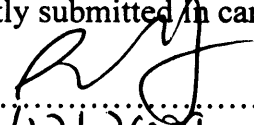
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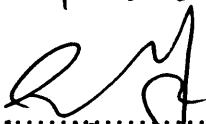
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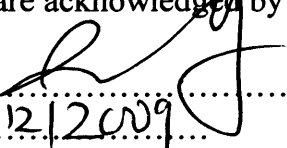
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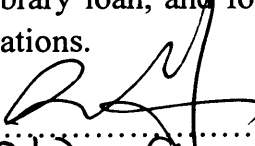
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Abstract

This dissertation seeks to contribute to the body of literature covering the field of inter-organizational relationships of entrepreneurial firms in developing economies. More specifically, this study attempts to fill a significant gap in the research into relationships between entrepreneurial firms and their venture capital investors in China. Even though it has been recognized that social capital embedded in inter-organizational relationship may be more important in imperfect completion characterized by weak institutional support and distorted information, there is little rigorous, theory-based, empirical research that focuses on the factors influencing the monitoring and value-added that start-up companies receive from their venture capital investors in developing countries. This dissertation contributes to the literature by developing and empirically testing a model of the monitoring and the value-added mechanisms and of the factors influencing those mechanisms.

Based on a review of the literature covering venture capital and related domains of research into inter-organizational relationships, this dissertation identifies formal and informal monitoring as the primary mechanism through which venture capital oversee their investees, and classifies resource and knowledge access as the major mechanisms through which venture capital investments add value to technology-based new firms beyond financing.

Building on received theories, an integrated model of the monitoring and value-added mechanisms, and the factors influencing those mechanisms is developed. The model draws on the agency theory and the asymmetric information and resource-based view of the firm in order to understand the factors influencing both mechanisms. These theories are complemented by social capital theory in identifying the factors facilitating monitoring and sharing resource/knowledge across organizational boundaries.

In order to test the model empirically, primary data were collected from fund managers of active Chinese venture capital using two sequential mail surveys. The primary data were complemented by archival data. The hypotheses were tested using multivariate statistical techniques, including multiple regression analysis and structural equation modelling. The model and the hypotheses received support from the empirical data.

This dissertation makes important contributions to the literature in the area of venture capital and inter-organizational relationships of technology-based new firms in the Chinese business environment. The findings have important practical implications for venture capital either seeking investment opportunities in China or already managing an existing investor relationship with a Chinese investee. In addition to venture capitalists, the findings have important implications for entrepreneurs.

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Critical to the success of this study was the contribution of a large number of fund managers of venture capital firms all over China who devoted their valuable time in responding to the survey. I am grateful for the time they devoted to this research. I also want to thank several fund managers who met me and shared their time and insights and greatly improved my understanding of the dynamics in the relationships between ventures and venture capitalists.

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CHAPTER 1 INTRODUCTION

James Wolfensohn, the recent World Bank President, once said, “The Chinese have accomplished in only 20 years what would take many other countries two centuries to achieve”. Statements such as these are not far-fetched: apart from undergoing many structural changes, China has maintained gross domestic product (GDP) growth rates of 8 per cent per annum since 1980, has an increasingly affluent population of approximately 1.3 billion and an emerging middle class, making it an economic powerhouse in the region. In 2007, China overtook Germany and became the third largest economy in the world in terms of GDP (Wall Street Journal July 16, 2007).

These developments have attracted a lot of attention from overseas investors and – not surprisingly – a considerable amount of foreign capital. Of particular interest to investors have been venture capital investments in recent years (Business Week, 2006). Statistics show that in 2006, China took second place in the world as the country with the largest amount of venture capital investments after the United States (Financial Times, 2007). Given China’s fast growing economy and promising future, Western interest is unlikely to subside any time soon. Yet, entering the Chinese market is not straightforward. Even outside of Asia, there is ample evidence of significant cross-country differences in venture capital markets and their internal structures, making it difficult for industry professionals to move from one market to another. While the gap appears to be shrinking among Western – particularly European and North American – markets in recent years (Oehler et al., 2006), the disparities between the Western venture capital markets and the emerging venture capital market in China remain large (Pukthuanthong, 2007). In the West, legal protection, efficiency, and public information disclosure are important factors for investors. In contrast, personal relationships, networking, and

harmony are ranked highly in East Asia (Ahlstrom and Bruton, 2001; Chen, 2006). The Chinese culture in particular places a large emphasis on the maintenance of so-called “Guanxi”, under which harmony with and within organizations is frequently in favour over information disclosure and shareholder rights (Bruton et al., 2004). While Western business culture emphasizes shareholder rights protection and information transparency, Chinese business culture focuses on networking, harmony, and seniority. In addition, the Chinese culture typically has a high tolerance for information asymmetry between the firm’s insiders and external investors as well as outside board members (Bruton et al., 2002b).

A proper understanding of these differences and the challenges they create is very important, particularly in an industry that is already as complex and risky as the venture capital market. Given the difference of institutional environment, it is particularly important for venture capitalists to understand how to effectively monitor Chinese investees, how to add the potential economic value for these portfolio firms, and how to manage the relationship within the Chinese business culture environment. So far, there has been no rigorous empirical research into these issues. To help Western investors avoid potentially costly mistakes, this study aims to provide a detailed first ever empirical research on inter-organization relationship between China’s venture capital firms and their technology-based portfolio companies.

In the second part of this chapter, research background, research problem, research objectives, and research approach and methods are introduced. At the end of the chapter the key concepts are defined and explained.

1.1 Research Background

While China offers growth opportunities for firms, it also imposes challenges for

them. China's formal institutional constraints such as inefficient legal frameworks and weak intellectual property rights pose significant problems for technology-based firms. In addition to those constraints, technology-based firms are also, in general, associated with long product development lead time, unproven markets, limited asset base (Van Auken, 2004), and are highly dependent on external resources such as financing and managerial skills (Van Auken 2000, 2004; Van Auken and Sonneborn, 2001; Jarillo, 1989; Pfeffer and Salancik, 1978; Stinchcombe, 1965). These issues generate investor apprehension about investing in technology-based firms. Venture capital is commonly cited as important sources of capital for technology-based firms with high growth potential. Previous researches show venture capital provides not only money, but also, often close supervision, valuable, hands-on help and expertise in turning new ventures into successes (Hellmann and Puri, 2000; Sapienza, 1992).

The main unit of analysis in this study is the inter-organizational relationships between venture capital investors and their technology-based portfolio companies in China. The purpose for selecting technology-based firms is that venture capital investors can potentially have a significant influence on the performance of technology-based firms (Gompers and Lerner, 1998; Hellmann and Puri, 2001; Maula and Murray, 2000). Building on received theories and empirical research, the present dissertation develops and validates an integrated multi-theoretic model of the monitoring and value-added mechanisms and the factors influencing these mechanisms in the relationships between venture capital and their technology-based portfolio firms in China.

One of the key perspectives of this analysis is the agency theory. Based on the assumptions of agency theory, the objectives of the agent may not align perfectly with those of the principal. Furthermore, asymmetric information makes it hard for the principal to select and monitor the agent. Goal incongruence and asymmetric

information may give rise for agency problems including adverse selection and moral hazard problems (Eisenhardt, 1989). Most of the existing literature on venture capital generally understands venture capital from an agency perspective (Zeng, 2004). There are severe information and incentive problems associated with venture capital investment because venture capital is focused on investing in young and unproven technology-based firms. Solutions to these problems are critical to success of venture capital financing (Kaplan and Stromberg, 2003). Previous research on venture capital suggested venture capital may relieve the problems caused by asymmetric information and goal incongruence through both formal and informal monitoring (Tsui et al., 2004; Pruthi and Wright, 2003). These two monitoring mechanisms have been factored into the integrated multi-theoretic model in this dissertation.

Another key perspective of this analysis is the resource-based theory of the firm, which views firm resources as the primary determinant of competitive advantage of the firm (Barney, 1991; Penrose, 1959). It is recognized that technology-based start-ups often lack some critically important complementary resources (Teece, 1986). Therefore, resource-combining alliances with venture capital are often an important strategy for technology-based firms (Park et al., 2001; Rothaermel and Deeds, 2001; Deeds and Hill, 1996; Eisenhardt and Schoonhoven, 1996; Rothwell, 1989; Rothwell and Zegweld, 1982). For a technology-based firm, venture capital investments may be a potential way of accessing resource with venture capital firms.

Some researchers argue that closer relationships can assist monitoring progress (Smith, 2003; Pukthuanthong et al., 2007; Bruton et al., 2002; Lee and Dawes, 2005). Other researchers state that better relationships facilitate resource and knowledge sharing between organizations (Nahapiet and Ghoshal, 1998; Tsai and

Ghoshal, 1998; Yli-Renko et al., 2001a). This dissertation applies social capital theory in explaining some of the variation in the level of formal and informal monitoring, resource and knowledge access. Contributing to the understanding of the social capital theory, the present study provides new empirical evidence on incentive and influence of social capital in China, where Guanxi (explained later in this Chapter) is widely recognized and playing a central role in business (Standifird and Marshall, 2000).

The last key perspective of this analysis is the theory of inter-organization relationship. Previous literature suggests that the greater the environmental uncertainty, the more likely it is that firms will rely on inter-organizational relationship to mitigate risk (Pfeffer and Salancik, 1978; Powell, 1990). The social capital embedded in inter-organizational relationship may be more important in imperfect competition characterized by weak institutional support and distorted information (Burt, 1997). Given that most existing research has taken place in relatively stable Western economies, it follows that the inter-organizational relationship in China may embody more useful social capital that can compensate for China's lack of market-supporting institutions such as transparent laws and regulations (Peng and Heath, 1996). These settings, therefore, offer a fascinating context in which to explore the inter-organizational relationships which is largely dominated by research that counts the number of relationships and examines the network structures, rather than analyzing specific relationships in more detail (Stuart, 2000; Yli-Renko et al., 2001a).

Inter-organization relationships are basically the inter-personal ties between two organizations. Most Chinese cultivate intricate and pervasive personal ties, called Guanxi, which govern their attitudes toward social and business relationships (Tsui and Farth, 1997). Although managers all over the world devote a considerable amount of time and energy to cultivating interpersonal ties

(Mintzberg, 1973), Chinese managers have a widely noted cultural propensity and institutional imperatives to rely on informal interpersonal ties, and to resort to personal connection to achieve organizational goals (Luo and Chen, 1997; Boisot and Child, 1996; Peng and Heath, 1996). As a result, the present study used primary data collected from fund managers of venture capital firms based in mainland China since China represents an ideal research laboratory in which to explore the inter-organizational relationships.

It has to be bore in mind that the inter-organization relationship between the venture capital firms and the investee companies is very important to discuss. The present study seeks to contribute to the literature by developing an integrated multi-theoretic model of monitoring and value-added mechanisms and how Guanxi and complementarities influence those mechanisms. By building the model on the basis of received theories and empirical research in related fields, and by testing the model and hypotheses by means of primary data, the present study hopes to create a better understanding of venture capital and of the monitoring and value added activities as related specifically to technology-based firms in China. This study also hopes to contribute to the larger body of literature on inter-organizational relationships by examining the relationship within Chinese venture capital industry. The findings have important practical implications for both China's venture capital and entrepreneur on selecting investees/investors, and managing existing investment relationships with investees/investors as well as for seeking to maximize investment/enterprise's performance. Finally, to our knowledge, this is the first empirical study that examines the impacts of Guanxi and complementarities on monitoring and value-added mechanisms in transitional economies context and in the context of China. Therefore, we see a contribution to the management literature on transitional economies as well as the Chinese context.

1.2 Research Problem

There is some evidence that the operation of venture capital in emerging markets shares some features with that in the more developed markets of the West, but that there are also substantial differences (e.g., Bruton and Ahlstrom, 2003; Bruton et al., 2002; Bruton et al., 2004). Previous studies have examined specific countries such as China (Bruton and Ahlstrom, 2003). These studies have found that while the model of venture capital in developed markets has relevance to the practice of venture capital in China, little is known about how these models require change for Chinese market. The present dissertation focuses on the monitoring and value-added provided by venture capital investors for their portfolio companies.

Based on previous research on venture capital in developed markets which has suggested that venture capital firm through monitoring and value added activities can make a positive impact on the performance of portfolio companies (Kann, 2000; Kelley and Spinelli, 2001; Gompers and Lerner, 1998; Maula and Murray, 2000a). However, there is a significant gap in the research on the actual relationships and the mechanisms through which venture capital investors may actually mitigate agency risk and influence the performance of technology-based firms. This dissertation attempts to fill this major research omission by developing theory-based hypotheses about the factors affecting the monitoring and value-added, and by testing these hypotheses using primary data collected from the fund managers of venture capital firms based in mainland China. The main research problem can be defined as a question

What are the key mechanisms through which venture capital investments mitigate agency risk and add value to technology-based firms, and what factors influence these mechanisms?

In order to tackle the research problem, the first challenge is to conceptualize the

monitoring and value-added mechanisms on the basis of the literature and theoretical reasoning. The research problem is broken into three generic research questions. The first generic research question is

What are the key mechanisms through which venture capital investors may actually mitigate agency risk in the relatively uncertain institutional environment?

The second generic research question is

What are the key mechanisms through which venture capital investors may actually add value to portfolio companies in transitional economies?

In addition to understanding what the monitoring and value-added mechanisms are, it is important to understand how these mechanisms work, and what influences them. Therefore, the third generic research question is

What factors influence monitoring and value-added mechanisms?

The above three research questions have normative implications for venture capitalists. The factors affecting the monitoring and value-added can be divided into structural factors that can only be managed through selecting a right partner, and behavioural factors that can be managed within the relationship (Stronks et al., 2008). Because of the structural factors that cannot be managed after the investment has been made, the selection of suitable complementary investors is very important. Therefore, the fourth generic research question is

How should venture capitalists select technology-based firms?

In addition to structural factors that cannot be managed after the relationship has been established, there may be behavioural factors affecting the monitoring and value-added that can be managed within the investment relationship. Understanding these factors helps in managing the investment relationships. Therefore, the fifth generic research question is

How should venture capitalists manage their relationships with technology-based firms?

1.3 Research Objectives

The overall objective of this dissertation is to identify the monitoring and value-added mechanisms and to identify the factors that affect these mechanisms.

The detailed objectives of the dissertation are:

1. To review and analyze the research on venture capital and related fields in Western countries
2. To review recent research on venture capital in China
3. To review the literature on China's regulatory systems, capital market structure and culture distinction to study venture capital in a Chinese business setting
4. To review the theoretical approaches applicable to the analysis of monitoring and value-added provided by venture capital investors in China
5. To conceptualize the mechanisms through which venture capital investors monitor and add value to their portfolio companies
6. To conceptualize the factors that influence the mechanisms through which venture capital investors monitor and add value to their portfolio companies
7. To generate a set of empirically testable hypotheses linking the monitor and value-added mechanisms to the factors affecting them
8. To empirically test the hypotheses. This will include operationalizing the theoretical constructs, designing the research instrument, identifying a suitable sample, designing and carrying out the data collection, and using suitable quantitative methods to statistically test the hypotheses

9. To present conclusions regarding the significance, reliability, and validity of the results of the study
10. To discuss the theoretical, empirical, and practical implications of the findings of this study

This study, focusing on venture capital investment in China, is of particular interest to venture capitalists, is also interesting to entrepreneurs, policy makers and academics.

A number of stakeholders, including Western venture capitalists, can learn how to effectively monitor and add the potential economic value to Chinese portfolio firms from the result of the present study. In addition, it is of particular interest to Western venture capitalists to understand how Guanxi and complementarities influences these two mechanisms. This knowledge may help venture capitalists to manage the relationship with investees in the Chinese business culture environment. It may also help them to select those firms that are likely to be complementary to them with respect to monitoring and value-added requirements.

Second, this research is of interest to entrepreneurs. Especially with regard to understanding what matters to venture capitalists during the selection phase, and what factors drive this selection behaviour. This can help entrepreneurs to better choose the appropriate investor, and may increase his/her chances of finding appropriate venture capital financing. Also, understanding how venture capital can affect company growth is of major interest to the entrepreneur, as it can allow entrepreneur to select the investor that is likely to fit the business plan growth perspectives best, and may increase the chances of finding the right venture capitalist for the business.

Policy makers are interested in understanding what incentives can stimulate partnerships between venture capital firms and entrepreneurs and what factors affect venture capitalists' monitoring and value-added mechanism. It may also interest to them to know whether public funds behave differently from non-public and public/private partnerships, both with respect to monitoring and value-added mechanism. Understanding how venture capital and entrepreneur could also create new value through the inter-organisational relationships. This is of major concern to Chinese policy makers, trying to increase employment levels and develop domestic technology-based firms.

Finally, this study is of interest to academics and can make an important contribution to management science. It is the first rigorous empirical analysis of relationships between venture capitalists and technology-based firms in the transitional economy of China. Most existing research has taken place in relatively stable, Western economies and some researchers argued that inter-organizational relationship in transitional economies such as China may embody more useful social capital that can compensate for these countries' lack of market supporting institutions such as transparent laws and regulations (Peng and Heath, 1996). By building a theoretically grounded model of the monitoring and value-added mechanisms and the factors affecting these mechanisms in China, the present study will provide empirical support for previous theoretical venture capital research on Guanxi, monitoring and value-added in transitional economy setting and giving a deeper understanding of relationships of venture capital investors with their portfolio companies in transitional economy. This study comprehensively analyses monitoring and value-adding mechanisms and the factors influencing them. By employing primary data collected from the fund managers of venture capital based in mainland China, it has been able to test the roles of different monitoring and value-adding mechanisms and the factors

influencing these mechanisms, especially Guanxi, thus creating increased understanding of the monitoring and value-added processes in venture capital investment in a transitional economy.

1.4 Research Approach and Methods

The lack of research into the monitoring and value-added conducted by venture capital investors raise a question of the most appropriate research approach. The lack of previous research could justify an explorative research method. But this method has been soundly criticized by many researchers for its unsophisticated design and inability to achieve conclusive results (Aaker, Kumar and Day, 2001; Zikmund, 1994; Armstrong, 1970). Armstrong (1970) argued that the exploratory approach tends to be akin to a projective test in psychology. The researcher has much more freedom to read his/her own ideas into the data. He/she can experiment with an almost unlimited number of possible models and choose one which fits his/her needs. Zikmund (1994) suggested that the best way to avoid the problems associated with using exploratory research is not to do exploratory research. More precisely, researcher should try to reduce the degree of exploratory work in a given study by the extensive use of a priori analysis as it forces the researcher to develop most of the model before he/she looks at the data. The present study evades these problems by using a more sophisticated research methodology—Structural Equation Modelling (SEM) which is a statistical technique that integrates multivariate techniques like regression analysis and factor analysis.

Structural Equation Modelling has increasingly been seen as a useful quantitative technique for specifying, estimating, and testing hypothesized models describing relationships among a set of substantively meaningful variables (Thompson & Daniel, 1996). This approach requires wide and extensive literature

reviews of relevant fields to understand the relevant concepts both in theory and in practice and to identify the most important facets of constructs (latent variables) and the measurement items (observed variables) which have to be developed on the basis of previous research. This approach greatly restricts the freedom of the researcher in massaging the data and produces largely conclusive results.

While there is little research into the specific topic of the present dissertation, the monitoring and value-added mechanisms conducted by venture capital investors to their portfolio companies, there is a lot of research into related, relatively similar contexts of inter-organizational relationships (e.g. Bergemann and Hege, 1998; Reid, 1998, 1999; Kaplan and Stromberg, 2003). By reviewing thoroughly relevant research in these related fields and identifying the commonalities in these literatures, it is possible to build relatively strong hypotheses on these mechanisms.

The Structural Equation Modelling approach advances the understanding of monitoring and value-added mechanisms in venture capital investment further than what would be possible through an explorative survey and helps to consolidate the existing streams of literature on inter-organizational relationships by identifying commonalities in these literatures and validating the hypothesis in the context of venture capital in transitional economies. By conducting a thorough literature review, consolidating the literature, building robust hypotheses, and testing them empirically in the context of venture capital in China, the present study attempts to contribute not only to the understanding of venture capital but also to a more specific understanding of inter-organizational relationships in China.

The conceptual frameworks and the hypotheses of the dissertation are developed on the basis of an extensive review of research into both venture capital and

related fields in Western countries and China, and of theoretical approaches relevant to the analyses of the monitoring and value-added conducted by venture capital investors to their portfolio companies. Theoretical constructs are then operationalized by adopting measures from previous research, and by developing new theory-based measures where needed. Exploratory interviews with venture capital investors are used in developing the hypotheses and the questionnaire instrument. The hypotheses are thus tested empirically using statistical methods. The data used in the analyses were collected with face to face interview and mail survey in September 2006 from the fund managers of venture capital firms based in mainland China. The primary data collected with the mail survey is complemented by secondary data gathered from several databases such as IPO2Zero.com.cn. The hypotheses are tested by confirmatory factor analysis, multiple regression analysis, and structural equation modelling.

By building on received theories and empirical research and developing an integrated model of the monitoring and value added mechanisms and the factors influencing those mechanisms, by collecting both primary and secondary data, and by subjecting the hypotheses to rigorous empirical testing, this dissertation aims to consolidate and expand the existing literature on relationships between venture capitalists and their portfolio companies and to contribute also to a wider body of literature on inter-organizational relationships between investors and investees.

1.5 Concepts

In this section, the key concepts are defined and explained. While this section presents some of the definitions, the operationalizations used in the empirical part of the dissertation are described in more detail in the methodology chapter (Chapter 4).

1.5.1 Venture capital

The broad concept of “venture capital” dates back for centuries. The roots of the venture capital industry lie as far back as the fifteenth century with the activities of merchant ventures who were active traders in the Far and Middle East where they also set up commercial enterprises (Reid, 1998). It is also believed that primitive venture capital was originally practiced in the Arabian Peninsula even in the pre-Islamic era. Cizakca (1995) finds the root of Venture Capital in the Islamic world. He argued that the Italians borrowed the Islamic version of Venture Capital ‘Mudaraba Concept’, in the tenth century and it then spread throughout Europe. However, Mudaraba offers some characteristics of venture capital, but differs in others.

The first contemporary venture capital firm was established in 1946 by MIT President Karl Compton, General Georges F. Doriot. The U.S. National Venture Capital Association defined venture capital as: “money provided by professionals who invest alongside management in young, rapidly growing companies that have the potential to develop into significant economic contributors” (NVCA 2001). Lorenz (1989) defined venture capital as long-term equity-based risk finance where the primary reward for the investor is capital gain. Bygrave and Timmons (1992:1) described venture capital as having a catalytic role in the entrepreneurial process, being fundamental value creation that triggers and sustains economic growth and revival. Wright and Robbie (1998) defined venture capital as investments by professional investors of long-term, unquoted, risk equity finance in new firms where the primary reward is eventual capital gain supplemented by dividend yield. Hellmann (2000b) defined venture capital as “professionally managed, equity-like financing of young, growth-oriented private companies”. All these definitions focus on the type of investments venture capitalists make and the rewards they gain from it. Further analysis of the development of the venture

capital industry is conducted in chapter 2.

However, there is more to venture capital than investing and exiting from investments. Gompers and Lerner (1999b:2-4) argued against the misguided belief that venture capitalists can add little value to young firms aside from providing money, or can be easily duplicated by an institution whose core strengths are very different. They went on to argue that these misconceptions have often led not only to a failure to capitalize on attractive opportunities but also to a substantial destruction of value. In their book, Gompers and Lerner defined venture capital as a process. They argued that venture capital can be viewed as a cycle that starts with the raising of a venture fund, proceeds through the investing in, monitoring of, and adding value to firms; the cycle continues as the venture capitalist exits successful deals and returns capital to their investors, to renew itself as the venture capitalist raises additional funds. This definition points to the very important monitoring and value-adding role of venture capitalists (Hellmann and Puri, 2000a; 2000b; Sapienza, 1992). Supporting this view, Hellmann (2000b) argued that a simple analogy of the role of venture capital is to consider venture capitalists as sport coaches. In his view, entrepreneurs are like athletes, who fight the actual game and get most of the glory in case of success, while venture capitalists are like coaches, who choose which athletes get to play, who train and monitor them, and who try to create the most favourable conditions for them to succeed in. Without coaches, inexperienced athletes would spend extraordinary effort on the wrong task. According to Hellmann, venture capitalists can similarly provide mentoring and guidance that helps entrepreneurs to turn their efforts into success.

An important aspect in venture capital is the manner in which venture capital firms are organized. Most of the professional venture capital firms are organized as limited partnerships in which the partners of the venture capital firm act as

general partners, while the institutional investors and other investors in the venture capital fund act as limited partners (Sahlman, 1990). This structure has been found to be efficient in alleviating agency problems between the investors and venture capital firms by providing strong incentives for venture capitalists to monitor and add value to the ventures (Gompers and Lerner, 1996; 1999a).

In China, the term “venture capital” is defined more broadly than it is in the USA. For example, all of the funds in the sample chosen for this study undertake early-stage investments, but they also finance later stage investments (which is referred to as “private equity” not “venture capital” in the US). Hence, we do not exclude venture capital firms from the sample data on the basis of the stage of development, because the same venture capital managers in the sample have contemporaneously invested in both early stage projects and buyouts. As such, we use the term “venture capital” in the broad definition of the term.

1.5.2 Technology-Based Firms

The definition of technology-based firms has many variations (Jones-Evans and Westhead, 1996). Typically, technology-based firms have been defined as businesses based on the exploiting of technological resources (Yli-Renko, 1999). In the present study, technology-based firms are defined on the basis of *the Venture Economics*' classification of high technology firms, which includes companies operating in the following sectors: biotechnology, medical/health science, Internet specific, communications, computer software and services, computer hardware and semiconductors/other electronics and new energy.

In addition to the term technology-based firm, we use synonymously the term portfolio company, which refers to a company in which a venture capitalist has made an equity investment. Similarly, the words ‘investee’, ‘start-up’, and

'venture' are also used as synonyms for portfolio company. All these terms are used to refer to technology-based firms in the study.

1.5.3 Guanxi

Social capital theory suggests that inter-organizational relationships facilitate the exchange of information and resources (Nahapiet and Ghoshal, 1998; Tsai and Ghoshal, 1998; Yli-Renko et al., 2001a). Social capital consists of networks of relationships and resources inherent in these networks (Bourdieu, 1985; Coleman, 1988). Research on social networks of entrepreneurs revealed that entrepreneurs obtain information and advice from network members (Birley, 1985) and access bank loans through contacts (Uzzi, 1999).

The idea of social capital and social networks in the Chinese context captures the indigenous social phenomenon called Guanxi (King, 1991; Luo, 2000; Tsui and Farh, 1997). The Chinese phrase "Guanxi" consists of two characters. The character "關 (guan)" means a gate or a hurdle, and "系 (xi)" refers to a tie, a relationship, or a connection. So Guanxi literally means "pass the gate and get connected." The concept of Guanxi refers to interpersonal relationships or connections and can be applied not only to kinship and friendship relationships but also to social connections, such as dyadic relationships (Bond and Hwang, 1987; Jacobs, 1979).

Research on Guanxi is not new. As early as the 1940s, the eminent Chinese anthropologist Fei ([1947] 1992, pp. 25–33, qtd. in Peng 2004, p. 1050) observed that whereas U.S. society is organized by voluntary associations based on universalistic principles and qualifications, Chinese society is organized by concentrically Guanxi circles, extending from the family (the core) to relatives, friends, and so on. Literally, Guanxi means social connection and is a synonym for

special favours and obligations to the Guanxi circle. The core of Chinese values is differentiated attitudes toward parents, children, siblings, kinsmen, friends, and so on, which Fei calls “differentiated mode of association.” Individual rights in the Chinese context are not universalistic but Guanxi specific and particularistic—that is, no tie, no obligation, and no rights. Guanxi is based implicitly on mutual interests and benefits (Yang, 1994), and some authors (Park and Luo, 2001: 457) even describe it as “utilitarian rather than emotional” and “based entirely on the exchange of favours, not an emotional attachment.” In sociological terms, Guanxi consists of personal ties or social bonds (Walder, 1986) and is described by some management consultants as “the informal connections so essential to gaining approval for or access to just about everything in China” (Tsang, 1998; p. 64). Guanxi is among the most important, talked about, and studied phenomena in China today. Guanxi lies at the heart of China’s social order, its economic structure, and its changing institutional landscape. It is considered important in almost every realm of life, from politics to business and from officialdom to street life (Gold, Guthrie, and Wank, 2002: 1).

In the context of venture capital, previous research into China has emphasized the important role of Guanxi plays in venture capital investments as a risk-mitigating device (Bruton and Ahlstrom, 2003). As the basis of all relationships lies within unwritten social rules, this process is far more pervasive than economic or legal controls in China. Unlike Americans and Europeans, Chinese traditionally do not rely so heavily on laws, regulations, and contracts (Bruton and Ahlstrom, 2003). As such, venture capital firm may not expect carefully worded agreements and China’s legal system to solve all the difficulties (Lieberthal and Oksenberg, 1988).

Chen and Chen (2004) proposed three sequential stages of Guanxi development.

The first stage is initiating Guanxi, which follows the principle of mutual disclosure. The second stage is building and maintaining Guanxi, following the principle of dynamic reciprocity. The third stage is using Guanxi, based on the principle of equity. In Chen and Chen's model, the authors treat Guanxi as a variable that changes as a function of the relationship stages and associated operating principles. In the present study, we adopt this dynamic view. Basing on Hwang's (1987) and Yang's (1993) categorization of Guanxi, we proposed two sequential stages of Guanxi in venture capital investment in China, namely pre-contract Guanxi and post-contract Guanxi. In pre-contract Guanxi – an instrumental-tie relationship, there is no expectation on either side that it will undertake any exchange of affection in the future, so they expect objective, fair and immediate exchanges and follow the rule of equity. In post-contract Guanxi – a mixed instrumental and expressive-tie relationship, the social exchange follows the rule of dynamic reciprocity, with 'the component of affection in the relationship serving the instrumental function of striving for needed resources' (Hwang, 1987: 957). We exam these two Guanxi stages separately.

The present study focuses on Guanxi between the venture capital investor and technology-based companies. We apply the measures from Lee and Dawes (2005) Ganesan (1994), Chen and Peng (2008), Tsai and Ghoshal (1998) and Yli-Renko et al. (2001a) and measure Guanxi as trust, knowledge of investees on a personal level, and the existence of frequent meetings at work and after work which used earlier in the context of venture capital by Sapienza (1992) and Sapienza and Gupta (1994).

1.5.4 Complementarities

One of the key concepts in this study is the complementarities between venture capital investors and the technology-based firms. Complementarities refer to the

degree the venture capital investor and their portfolio company complement each other (Maula, Autio and Murray, 2003). The complementarities can be related in resources and capabilities, products and services, or some other dimension. The key determinant of complementarity is whether the success of one player is positively related to the success of the other player (Brandenburger and Nalebuff, 1996).

One of the key dimensions of complementarities is the complementarities between the resources and capabilities of the two companies. Typically, investee 'nearly always has a technology advantage but has little or no management skill or experience'. Venture capital investor, correspondingly, normally has a team of specialists in finance, marketing, economics and law (Smith, 2005). The resource between foreign venture capital and Chinese technology-based firms are even more complementary. The foreign venture capital firms, though often possessing valuable resources such as financial capital and managerial capabilities, still need to learn about local markets, about often vague and changing institutional arrangements and how to gain access to social connections (Arregle and Borza, 2000). Conversely, while technology-based firms are familiar with local conditions, they usually short of capital and managerial skills.

Besides complementarities in resources, there can be complementarities in other dimensions as well. For instance, Amit and Zott (2001) argued that, "complementarities are present whenever having a bundle of goods together provides more value than the total value of having each of the goods separately." This definition is partly based on the work by Brandenburger and Nalebuff (1996) who highlighted the importance of providing complementary outputs to customers. In their game theory based competition framework, they stated that that, "A player is your complementor if customers value your product more when they have the

other player's product than when they have your product alone" (Brandenburger and Nalebuff, 1996:18). Following Brandenburger and Nalebuff (1996) and Amit and Zott (2001), we also consider complementarities in both inputs and outputs. In addition to resources, complementarities in the product markets of the two companies are likely to influence their capability and willingness to collaborate.

1.5.5 Asymmetric Information

In the concept of asymmetric information, the seminal paper of Akerlof (1970) is often referred as the first investigation of the economics of unevenly distributed information. In his paper, Akerlof demonstrated, using an example from the market for used cars, how markets can break down when potential buyers cannot verify the quality of the product they are offered. Faced with the risk of buying a "lemon" (bad quality product), the buyer will demand a discount, which in turn discourages the potential sellers who do not have "lemons". Akerlof gave examples of the possible application areas of the theory in many areas including insurances. In the context of insurances, the theory of asymmetric information helps to understand the problem of adverse selection, which means that as the price level of insurance increases, the people who insure themselves will be those who are increasingly certain that they will need the insurance (Akerlof, 1970).

In venture capital, investments are made in young and highly uncertain ventures. Chan (1983) developed a model on how venture capitalists, as better-informed intermediaries, may relieve the problems caused by asymmetric information. Other studies examining the role of asymmetric information in venture capital contracting include Amit et al. (1990), Admati and Pfleiderer (1994), Bergemann and Hege (1998), and Trester (1998). In venture capital contracting, various methods are used to deal with asymmetric information including monitoring and staged investments (Gompers, 1995; Sahlman, 1990). Focusing on the initial

public offerings of firms backed by venture capital investors, Barry et al. (1990), Megginson and Weiss (1991), Francis et al. (1999), Hamao et al. (2000) among others have examined the role of venture capitalist in reducing the problems from asymmetric information in initial public offerings.

1.5.6 Agency Theory

The origins of the agency theory date back to Adam Smith, who in 1776 described how managers of companies owned by others cannot be expected to manage the business as well as if it was owned by themselves (Smith, 1776). In the modern literature, Jensen and Meckling (1976) introduced the agency theory viewing external financing of a company as a principal-agent problem. In their paper, they defined the agency relationship as “a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent”. In the agency theory, both principals and agents are assumed to be self-interested, rational, and risk-averse (Eisenhardt, 1989).

Based on the assumptions of agency theory, the objectives of the agent may not align perfectly with those of the principal. Furthermore, asymmetric information makes it hard for the principal to monitor and add value to the agent. Goal incongruence and asymmetric information may give rise for agency problems including adverse selection and moral hazard problems (Eisenhardt, 1989). In the context of venture capital, agency theory has typically been used in the analysis of principal-agent problems considering the entrepreneur as an agent working for the principal venture capitalist.

From monitoring perspective, Gompers (1995), applying agency theory in his analysis, analyzed 794 venture capital backed firms and found that asymmetric

information (decreases in the industry ratios of tangible assets to total assets, higher market-to-book ratios, and greater R&D intensities) lead to more frequent monitoring. The monitoring model of this study follows this approach and considers the entrepreneur as an agent working for the principal venture capitalist.

Some researchers have applied agency theory to examine the value-added relationship between venture capitalists and portfolio companies. For instance, Sapienza and Gupta (1994) analyzed 51 venture capitalist-CEO dyads and found support for agency theory predictions in that frequency of interaction depended on the extent of venture capitalist-CEO goal congruence, the degree of CEO's new venture experience, the venture's stage of development, and the degree of technical innovation the venture was pursuing. However, the degree of management ownership had no impact on the frequency of interaction. Along the same lines, Lerner (1995) analyzed 271 venture capital backed biotechnology firms and found support for agency theory predictions. He found that venture capitalists' representation in the board of directors increased around the time of turnover of chief executive officers, while the number of other outsiders remained constant. The present study also considers potential agency problems in the relationship of original owners of the ventures as agents and venture capitalists as principals in the value-added model. There is great potential for conflicts of interests between start-up companies and their investors operating in related fields (Hellmann, 2001; Kann, 2000; Maula and Murray, 2000a; 2000b), and investors may face agency problems related to the asymmetric information in forms of moral hazard and adverse selection risks when deciding which value is most needed and should be added to the investees.

1.5.7 Monitoring

The nature of the principal-agent relationship assumes that the principal is the

lead player (Jensen and Meckling, 1976; Fama, 1983a,1983b), who attempts to control the relationship by the input of resources and by employing agents to work on his behalf. As he requires reassurance that his resources are being utilized to their best advantage (Fried et al., 1998), we might expect him to install a system of monitoring and control. Theories of financial intermediation tend to focus on the monitoring role of intermediaries (for example, Diamond, 1984; Stiglitz, 1985). Venture capitalists are uniquely positioned to provide such monitoring services since they have access to detailed knowledge of their portfolio companies. Several studies confirm that venture capitalists serve such a role in start-up companies (Gorman and Sahlman, 1989; Chan, 1983).

This study makes a distinction between formal and informal monitoring mechanisms. Formal monitoring which refers to the specified contractual conditions such as restriction on management's actions and requirements for the provision of detailed and regular information encoded in a business contract and enterprise's Articles of Association/Corporate Charter. Informal mechanisms include all the monitoring activities that are not clearly codified in a formal contract, such as residual rights of control that are bestowed through ownership and monitoring through personal interactions (Grossman and Hart, 1986; Hart, 1995).

1.5.8 Formal Monitoring

An organization is the nexus of contracts, written and unwritten, among owners of factors of production and customers. In venture capital contracting, various methods are used to deal with agency problem including various restrictions and staged investments (Gompers, 1995; Sahlman, 1990). These contract terms specify the rights of each agent in the organization, performance criteria on which agents are evaluated, and the payoff functions they face (Fama and Jensen, 1983a).

To deal with agency risk, venture capital firms can specify contractual conditions that place restrictions on management's behaviour. The conditions include restrictions on management's ability to sell the business without the consent of the venture capitalist, restrictions on capital expenditure and acquisitions, etc. (Kaplan and Stromberg, 2001a). Agency theory would suggest that all possible consequences of additional investment should be analyzed pre-investment.

1.5.9 Informal monitoring

In practice, the contract is the settlement of differences in which each side makes concessions. Venture capitalists cannot legalize all the monitoring measures in their formal contract (Smith, 2005; Peng, 2000; Tsui, 2004). Furthermore, in transitional economies, where is a business environment where formal institutional constraints such as laws and regulations are weak. As a result, the effect of formal monitoring may be subdued (Peng, 2000; Tsui, 2004). Therefore, informal monitoring may play a more important role in facilitating information exchanges and hence assert a more significant impact on firm performance in transitional economies (Peng and Heath, 1996). These involvements helps to protect the interest of the venture capital firm, ameliorate the problems of information asymmetry and increase the likelihood of higher return on investment (Sahlman, 1990). In their recent research about inter-firm relationships in China, Tsui et al. (2004) found that Chinese regards contracts as backward rather than forward looking. The finding is in line with Das and Teng (2000) who suggests that the contract should be considered as a 'backdrop' to the relationship between transacting parties, and should only act as a set of promises which the law recognizes as a duty and has some prescriptions when breached (Macneil, 1974).

Therefore, it is important to draw attention not just the specific rights of control that are detailed in contracts but also the informal monitoring. Pruthi and Wright

(2003) have concluded six main aspects of informal monitoring which are used in this study as the measure items.

1.5.10 Resource Dependence Perspective

The resource dependency perspective argues that no organization can survive alone, and that firms have to enter into inter-organizational relationships because they cannot generate all the necessary resources internally (Aldrich and Pfeffer, 1976; Jacobs, 1974; Pfeffer and Salancik, 1978). It builds on social exchange theory (Blau, 1964; Emerson, 1962) and explains the dependence on inter-organizational relationships (Jacobs, 1974; Pfeffer and Salancik, 1978). Pfeffer and Salancik (1978) have argued that when conditions of exchange and competition are uncertain and problematic, organizations attempt to establish linkages with elements in their environment and use those linkages to access resources, to stabilize outcomes, and to avert environmental control. However, using external links to gain access to resources makes firms dependent on the environment (Boyd, 1990; Pfeffer and Salancik, 1978).

1.5.11 Resource-Based View

The key idea of the resource-based view is that firm-specific skills, competencies, and other tangible and intangible resources are viewed as the basis for the competitive advantage of a firm (Barney, 1991; Peteraf, 1993; Prahalad and Hamel, 1990). Because of environmental uncertainty, the firm-specific resources and capabilities are considered as a more sustainable basis for competitive advantage than product-market positioning (Grant, 1991). The essence of a firm's strategy lies in the ways that the firm uses existing resources and in the means the firm acquires or develops internally additional unique resources (Wernefelt, 1984).

Since the emergence of the resource-based view, it has been widely applied in

empirical research explaining the success of entrepreneurial ventures and has many streams. One stream of resource-based theory of the firm, which is particularly related to this study, is its application in inter-organizational relationships — in this stream, inter-organizational collaboration and alliances are usually viewed as a mechanism to share or acquire resources. For example, in his research on the use of external resources, Jarillo (1989) found that entrepreneurial, fast growing firms used more external resources than their competitors. Eisenhardt and Schoonhoven (1996) extended the application of resource-based view to strategic alliances of young firms and found that firms entered into strategic alliances because of lack of internal resources in a vulnerable strategic position when pursuing innovative strategies in emerging competitive industries. Another reason why firms engaged in strategic alliances was the opportunity to take advantage of their own capabilities, such as a large, experienced management team. Park et al. (2001) found that firms' use of alliances as mechanisms to adapt to market uncertainties was contingent on internal resource conditions. In growing markets, resource-rich firms leveraged their resources by accessing external complementary resources and reduced uncertainty through alliances while resource-poor firms were less likely to do so. However, in relatively stable markets, this relationship is reversed and resource-poor firms became more active in alliance formation because of the need to enhance their short-term viability.

The resource-based view of the firm suggests that firms are heterogeneous in the resources they control (Penrose, 1959). Organizational resources consist of all the assets, capabilities, attributes, and knowledge a firm possesses that enable it to develop and implement strategies that improve performance (Barney, 1991; Wernerfelt, 1984). A firm's resources can be a source of competitive advantage in markets when these resources are valuable, rare, difficult-to-imitate, and have qualities that make them non-substitutable (Barney, 1991). Teece, Pisano and

Shuen (1997) extended the resource-based view with a dynamic perspective. They argue that because the value of a resource can change over time, competitive advantages come not only from organizational resources, but also from the firm's capability to continually create, integrate, and reconfigure new resources. There may be several ways in which new capabilities are developed by firms but most entail accessing new knowledge or organizational learning (Sirmon, Hitt and Ireland, 2007).

1.5.12 Resources

One of the key concepts of this study is resources. In her book on firm growth, which has become the foundation of the resource-based view of the firm, Penrose (1959) defined resources as “physical things a firm buys, leases, or produces for its own use, and the people hired on terms that make them effectively part of the firm” (Penrose 1959:67).

Some other authors have taken a broader view of resources. For instance, Wernefelt (1984:172) defined resources as “anything which could be thought of as a strength or weakness of a given firm. More formally, a firm's resources at a given time could be defined as those (tangible and intangible assets) which are tied semipermanently to the firm.” As examples of resources, Wernefelt (1984:172) listed “brand names, in-house knowledge of technology, employment of skilled personnel, trade contacts, machinery, efficient procedures, capital etc.” Along similar lines, Barney defined resources as “all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness” (Barney, 1991:101). Although both of these definitions are broad, there is an important difference between the definitions of Wernefelt and Barney, as Barney's definition includes only elements that are potentially rent

yielding (i.e. strengths).

An important distinction is the inclusion of capabilities, skills, and competencies as part of the resource portfolio of the firm. While some of the definitions clearly include these (Barney, 1991; Wernerfelt, 1984), some other authors have explicitly separated capabilities, skills, and competencies from other resources (Amit and Schoemaker, 1993; Grant, 1991). Amit and Schoemaker (1993) defined the difference between resources and capabilities as follows: “Resources can be defined as stocks of available factors that are owned or controlled by the firm... ..Capabilities, in contrast, refer to a firm’s capacity to deploy resources, usually in combination, using organizational processes, to effect a desired end.” Resources (such as individual employees, patents, brand names, finance etc.) are seldom productive alone but can be turned into outputs with the help of suitable capabilities (Grant, 1991).

The present work makes a distinction between resources and knowledge and considers resources as tangible or intangible assets possessed by the firm or accessed through inter-organizational relationships. Knowledge, on the other hand, is an ingredient that ensures that the stakeholders in the business extract higher value from those resources (Penrose 1959:76).

1.5.13 Knowledge

The traditional definition of knowledge is “justified true belief”, a concept first introduced by Plato (Nonaka and Takeuchi, 1995:21). This definition, grounded in Western epistemology, focuses on the explicit nature of knowledge. Knowledge is modelled as an unambiguous, reducible and easily transferable construct, while knowing is associated with processing information (Eisenhardt and Santos, 2000). In contrast with this traditional conception, a newer view of knowledge, based on

the distinction between explicit and tacit knowledge (Polanyi, 1958), has emerged. Tacit knowledge is linked to the individual, and is very difficult to articulate.

The distinction between tacit and explicit knowledge has been the basis for the emergence of the knowledge-based view of the firm (e.g. Grant, 1996; Kogut and Zander, 1992). The knowledge-based view argues that because tacit knowledge is difficult to imitate and relatively immobile, it can constitute the basis of sustained competitive advantage (DeCarolis and Deeds, 1999; Grant, 1996; Gupta and Govindarajan, 2000; Kogut and Zander, 1993).

Knowledge is the base of firm capabilities and thus, to develop capabilities, firms must access the appropriate knowledge stocks and integrate them. Manufacturing capabilities often require specific types and levels of technological knowledge, for example. Marketing capabilities require knowledge of markets and consumer behaviour as well as promotional activities. Firms must regularly access and learn knowledge to continuously reconfigure their resource portfolio and build new capabilities in order to remain competitive in dynamic markets (Sirmon et al., 2007).

The relationship between the terms knowledge and resources varies in the literature. While physical resources, such as land or money, are clearly distinct from tacit knowledge possessed by the employees of a firm, there is a large overlap between the concepts. The present study focuses on the outcomes of relationships between venture capital investor and their investees. In the examination of these relationships, we refer to resource access when defining access to concrete resources such as distribution channels, production facilities and technology. In contrast, knowledge access refers to the learning that portfolio companies undertake from their relationships with venture capital investors that

helps them use their own resources more efficiently and effectively (Penrose 1959:76).

1.5.14 Value-added

The primary role of venture capitalists is the provision of funding for young entrepreneurial firms (Gorman and Sahlman, 1989). However, venture capitalists are typically far from passive investors. According to Gorman and Sahlman (1989) venture capitalists spend half of their time in monitoring and post-investment relationships with, on average, nine ventures each. Because of their experience with numerous ventures and their large exposure to financial, labour, and other resource markets, venture capitalists are in a good position to support their portfolio companies. Venture capitalists have been acknowledged as providing valuable help for portfolio companies through the provision of advice and information to the entrepreneur and his/her team, through helping the firm obtain alternative further sources of equity financing, interfacing with the investor group, and helping their portfolio firms attract alternative sources of debt financing (MacMillan et al., 1988). Similar results have been found by Gorman and Sahlman (1989), Sapienza et al. (1996), and Rosenstein et al. (1993).

There are also some activities that have two-way function which can be monitored and which can add value to portfolio companies at the same time. These include monitoring financial and operating performance, which can potentially add value to portfolio companies. Following the previous research (Gorman and Sahlman, 1989; Sapienza et al., 1996; Rosenstein et al.; 1993), this study has used those dyad function actives as the measure to exam both monitoring and value-added mechanisms.

1.6 Structure of the Dissertation

The rest of the dissertation is structured as follows: Chapter 2 provides a literature review, in which extant literature on venture capital both in Western countries and China. Furthermore related fields and relevant theories of venture capital and China's law, finance and culture distinction are also reviewed; Chapter 3 presents the models and hypotheses; Chapter 4 describes methods, the sample, the selection and operationalization of the variables. Chapter 5 describes the empirical results of the study. Finally, Chapter 6 discusses the conclusions of the research, the possible interpretations of the findings and their theoretical and practical implications.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews the relevant literature in three parts. First, the review focuses on the extant research on the topic area describing the role of inter-organizational relationships for venture capital firms both in developed countries and China. Thereafter, China's regulatory systems, capital market structure, and culture distinction are reviewed in order to build a solid basis for hypothesis development. As there is very little earlier research on the monitoring and value-added provided by venture capital investors for their portfolio companies in China, literature on Western countries and other related types of inter-organizational relationships is reviewed and covers research on monitoring and value-added in venture capital and alliances between two firms. Finally, applicability of the theoretical approaches to the present study is assessed.

2.1 China's venture capital industry

China's venture capital industry has grown in recent years, and overtook the UK as the world's second-biggest destination for venture capital investments in 2006 with venture-capital investment rising 55% from the previous year (according to a report from Dow Jones VentureOne and Ernst and Young LLC), likely because it has many of the right elements that are required for a strong venture capital industry, including robust economic growth, a growing commitment to intellectual property rights protection, and a strong entrepreneurial culture. The latter not only drives much of the economic development in mainland China, but also in many other Asian countries such as Taiwan, Indonesia, and Singapore – countries that have experienced economic growth that is similar to that in China. Moreover, the Chinese educational system directs a large number of its students to programmes

in engineering and business at Chinese and overseas universities, laying the groundwork for its continued development and increasing dominance in world trade (Wall street journal, 2007).

The current structure of China's venture capital industry is a recent phenomenon emerging from decades of government-led technology policy and a still-transitioning business system. The Chinese government has always seen science and technology as a critical part of its search for economic development and national security (White, Gao and Zhang, 2002). Venture capital in the Chinese context, therefore, has been promoted not only a means to private gain, but also as a critical mechanism for linking scientific and technological capabilities and outputs, with national and regional economic and social developments.

Although still developing, China's venture capital industry is clearly an outcome of its particular combination of political, economic and social institutions and the nature of the broader changes it has been undergoing during its transition from central planning to a more market-based business system. China's venture capital industry, including the total set of related actors and institutions, has undergone a dramatic transformation over the last two decades. Because of its starting conditions—in particular, its legacy of inefficient central planning and socialist ideology—the results of this transformation seem particularly striking. The system that has emerged so far is highly complex in terms of variety and number of organizational actors. This complexity is increased because all of the organizational and institutional elements are themselves changing in response to policy, technological and other developments.

2.1.1 The history of venture capital in China

China's venture capital industry was established in the mid-1980s, when the Chinese government decided that it should develop local high-tech industries (Xiao, 2002). However, initial attempts to create a flourishing high-tech sector were not very fruitful, largely because government officials and early venture capitalists lacked the necessary understanding and expertise and frequently channelled their efforts in the wrong direction. The failure of the China New Technology Start-up Investment Company, a well-known venture capital firm in China that went bankrupt in 1997, serves as a good example. However with continued support from the government and the private sector, China's venture capital industry overcame its sluggish growth and started to flourish in 1999 and 2000, a time period characterized by strong stock market performance and investor optimism not only in China but also in the rest of the world. According to China Venture Capital Directory maintained by Zero2IPO, a venture capital research company based in Beijing, there were around 263 venture capital firms in China in 2006 and Beijing, Shanghai and Shenzhen are emerging as the centres of the venture capital industry.

The evolution of venture capital in China was marked by the establishment of so-called "China Direct Investment Funds" (CDIFs). These funds were listed on the Dublin, London, and Hong Kong stock exchanges and were primarily targeted at institutional investors. Yet, because the stock exchanges recognized these funds as investment companies, they restricted their investments. For example, Bruton and Ahlstrom (2003) point out, the London Stock Exchange prohibited CDIFs from becoming majority shareholders in any of the ventures they invested in, restricted them from playing a significant role in the management of a funded firm, and barred them from investing more than one-fifth of their capital pool in any one firm. Bruton et al. (1999) and Bruton and Ahlstrom (2003) note that, possibly as a

result of these restrictions, CDIFs were largely invested in government-owned state or township/village enterprises (TVEs) throughout China, not in privately owned businesses. CDIFs typically did not focus on a specific industry. Instead, they provided interim financing for firms in a wide variety of industries and aimed to build relationships with large state enterprises which, in turn, frequently helped the CDIFs source investment opportunities in other affiliated firms. Xin and Pearce (1996) and Bruton and Ahlstrom (2003) review the relationship between Sino-Chem – a large state-owned firm that is in charge of building external import-export networks for the chemical industry in China – and a Western CDIF. They note that the collaboration between Sino-Chem and the CDIF serves as a good example for the aforementioned symbiosis. As part of their deal, the Western CDIF provided not only money but also managerial expertise to Sino-Chem. In return, Sino-Chem located a number of chemical-related deals and provided the CDIF with the necessary connections to government officials to ensure the success of those deals. Once a CDIF decided to follow through on a proposed deal, it typically entered a joint venture with the funded firm and the large state entity that sourced the deal (Xin and Pearce, 1996).

Yet, a frequent problem for CDIFs was that large state entities like Sino-Chem often kept the best deals for themselves and only offered the lower quality deals to the CDIFs. Despite the poor performance that CDIFs frequently suffered as a result, a large part of China's venture capital industry is still organized in the form of CDIFs. What has changed, however, is that most of the new investment funds are not listed on stock exchanges any more. Instead, they are organized as limited partnerships, as is typically the case for US venture capital funds (Bruton and Ahlstrom, 2003).

2.1.2 Recent developments in China's venture capital industry

Today, venture capital investments in China are emerging from a range of different sources, including the central and provincial and municipal governments, state-owned enterprises, private firms, public companies, non-banking financial institutions, and foreign venture capital funds. As of 2006, and foreign funded venture capital firms account for 23 percent of China's venture capital organizations and their presence and market share keeps growing (Zero2IPO, 2007). More than 50% of domestic venture capital firms are state-owned, most of them are set up by provincial or municipal government driven by the regional and local economic and technological development. However, these venture capital firms are small and lack project evaluation capabilities as compared with their foreign independent counterparties (White, Gao and Zhang, 2002). As a result, domestic investors increasingly compete with foreign venture capital funds that possess abundant capital and superior project evaluation capabilities for access to high-quality investments in China, most of them in the fast-growing technology sector.

For years, the most active and successful players in Chinese venture capital markets have been mainly high-powered foreign investors like TPG, Carlyle Group and Kohlberg Kravis Roberts & Co., which are going after the country's prime assets. The situation may be about to change as Chinese central government now views venture capital as a real industry sector, and it's quietly cultivating a home-grown venture capital industry. Until recently, unfavourable tax laws hampered the development of a domestic, Yuan-denominated venture capital industry. Yuan funds had to pay income taxes, and their shareholders also paid income tax on their returns. That changed on 1st June 2007, when China established a law allowing for a venture capital structure that eliminates this double taxation. On October 2007, China's securities regulator cleared two of the

country's strongest domestic investment banks, China International Capital Corp. and Citic Securities Co., to make direct-equity investments (Wall street journal, 28/10/2007). That approval lifts a ban on venture-capital-style investing by securities firms that had been in place since April 2001. They now join Bohai Industrial Investment Fund Management Co., which at the end of 2006 became one of the Yuan-denominated venture capital funds in China to adopt the same model as Western rivals. Bohai, which is 53%-owned by Bank of China Ltd, raised more than £2 billion last year from investor and is led by industry veteran Mr. Au. Newly formed US\$200 billion sovereign-wealth fund, China Investment Corp., also makes direct equity investments, which paid US\$3 billion for 10% of Blackstone Group LP, the private-equity firm on May 2007 (Wall street journal, 12/05/2007). In order to bring in more experience, on either domestic or international market, domestic venture capital firms provide very competitive salary package to attract talented financial professionals. Big domestic venture capital firms also start aggressive recruitment campaigns both home and abroad. On October 2007, China International Capital Corp. kicked off its U.S. headhunting trip in Wall Street, Wharton School of the University of Pennsylvania and other business schools in the U.S. (Wall street journal, 16/10/2007). In May 2008, the Chinese government cleared the country's nearly \$75 billion national social-security fund to invest more freely with local private-equity funds, making it the biggest potential pool of capital for Chinese currency private-equity deals in the country (Wall Street journal, 16/05/2008).

Latest events show that the Chinese government no longer view venture capital funds as a means to promote scientific and technological capabilities, but also a mechanism to support its “go global” policy and an instrument to gain access to foreign technologies, raw materials and skills. On March 2007, China Development Bank, which bought a strategic stake in Barclays PLC, launched a

US\$ 5 Billion venture capital fund called China-Africa Development Fund (“The CADFund”), to encourage and support Chinese enterprises to invest in Africa via equity or quasi-equity investment. On October 2007, Industrial and Commercial Bank of China Ltd., which just purchased a 20% stake in South Africa's largest bank—Standard Bank, announced it had started up a venture capital fund to channel Chinese and global money into mining and resources companies. Private contributions to the fund are expected to bring it more than an initial \$1 billion (Wall Street journal, 1/11/2007).

At the same time, the future prospect for foreign venture capital firms looks less rosy, especially for big U.S. venture capital firms. The Chinese government has introduced a series of policies that make venture capital investments less easy for foreign venture capital firms. The real start of problems for international funds in China can be traced back to the failed bid by China National Offshore Oil Corp for US oil firm Unocal in 2005. That deal was sunk by political opposition in Washington based on concerns over national security and in the aftermath, many influential voices in Beijing called for reciprocal action. Eventually China's State-owned Asset Supervision and Administration Commission issued its own “national security” regulations, identifying large swathes of the economy, such as petrochemicals, telecoms and basic infrastructure, over which the government must retain control for the foreseeable future. Any company that could be considered a “national brand” also came under the tough new rules (Wall Street journal, 12/09/2006).

The Ministry of Commerce then took the lead in 2006 by promulgating legislation adding new layers of approval to any proposed investment by foreigners in a Chinese company and basically shut down the most popular offshore corporate structure used by overseas venture capital funds to invest in

Chinese companies and sell their shares on overseas stock markets. Foreign buyout funds now found it virtually impossible to take majority stakes in China, since the most interesting targets were almost all state-owned and the government was taking a much stricter line on the sale of any state assets. In an example of very bad timing, the Carlyle Group announced in October 2005 that it was about to become the first foreign private equity firm to take a controlling stake in a state-owned company—Xugong Construction Machinery, the country's largest crane and digger producer. The deal promptly ran into trouble, forcing Carlyle to revise its bid to a minority stake at a higher price. Two years later, the deal has yet to be approved (Wall Street journal, 6/8/2007).

The array of new barriers has not locked foreign funds out completely and while headline venture capital and private equity investment has dropped in 2007, it is still growing slightly if giant one-off investments in China's state-owned banks in 2005 and 2006 are discounted, according to data from the Asian Venture Capital Journal. Some venture capital funds are managing to operate by taking minority stakes in non-strategic industries as well as privately-owned companies. Others are trying to mitigate the restriction by selling a small stake of its own to Chinese government. The idea is simple, when Chinese government has more equity in the firms, its incentives should be more likely to be aligned with those of firms, and it is less likely to be against venture capital firms' investments. Blackstone Group has struck a deal in which it sold almost 10 per cent of itself to China's nascent sovereign wealth fund for \$3bn prior to its initial public offering in June 2007. The move appears to have paid off with the announcement last month of Blackstone's successful \$500m purchase of an 18 per cent stake in Bluestar, a sprawling state-owned Chinese conglomerate. Other big venture capital firms are likely to follow suit. Three of the biggest US private equity firms, Carlyle, Kohlberg Kravis Roberts & Co and TPG, have each held preliminary talks about selling a minority

stake to China's giant Social Security Fund, which had Rmb460bn (\$61.5bn) in assets at the end of June 2007(Financial Times, 30/10/2007).

In response to growing competition from domestic venture capital firms, foreign venture capital firms are also trying to make themselves less of an outsider in China. While most foreign companies first entered China with people from head office running their funds, the importance of language, personal relationships and the ability to navigate China's opaque regulatory and legal environment soon meant the foreigners were replaced by Chinese fund managers. Foreign venture capital firms are not only seeking to increase the local investment professionals but also the number of Chinese investors in its funds. This is a strategy that Carlyle has pioneered in Tokyo, where all Carlyle's investment professionals are Japanese. More than half of the money in Carlyle's Japan funds comes from local Japanese investors (Financial Times, 14/11/2007).

2.2 Unique Challenges in China

China has its very own long history and different regulatory systems and financial structure, and venture capital investors face a number of unique challenges in China. In this section, we aim to outline and examine the specific factors that have affected – and continue to affect – China's venture capital market and set it apart from its Western counterparts. A proper understanding of these differences should not only be beneficial to practitioners by helping them make better-informed investment decisions but also to academics who want to conduct further comparative research in this area.

2.2.1 China's Regulatory systems and capital market structure.

In recent years, there has been considerable debate among academics about what causes one country's capital market to develop differently from that of another

country. While most of that debate has revolved around broader issues such as economic growth and firms' access to capital (Allen et al., 2002), a small but growing strand of the academic literature focuses on the venture capital industry in particular. An early study by Black and Gilson (1998) points out that one of the main factors that causes the venture capital industry to differ from country to country is the underlying structure of the country's capital market, i.e. whether it is bank-centred or stock-market centred. Stock-market centred countries typically have many banks that are small relative to large corporations. The stock markets in these countries tend to be well developed and corporate governance functions tend to be conducted via cross-holdings and interchanging board memberships among the corporations. Bank-centred countries, on the other hand, tend to have fewer but larger banks that make significant investments in the corporate sector and consequently play a central corporate governance role. In contrast to the US capital market, which is largely stock-market centred, the Chinese capital market is by and large bank-centred, similar to that of Japan. European markets, in comparison, are somewhat mixed: the British and Irish capital markets are stock-market based whereas most Continental European countries have bank-centred capital markets (see Oehler et al., 2006). As is typical in bank-centred economies, Chinese banks tend to hold significant stakes in local firms and frequently serve on their boards of directors, a practice that is unusual for US firms. As Bruton et al. (2002b) points out, one of the reasons why a nation is bank- or stock-market centred is the regulatory scheme employed by that nation. In China – as in many other Asian countries – regulators have traditionally encouraged banks to own equity in customer firms and to serve on the boards of directors of those corporations. Regulators in the US and other stock-market centred countries typically oppose such relationships.

Bruton et al. (2002b) note that the Chinese regulatory system provides little

support for stock market development. First, the financial reporting requirements in China are far less transparent than Western reporting standards (Backman, 1995), which makes it difficult for investors to monitor their investments. Second, Chinese securities laws and their enforcement are comparatively weak, leaving shareholders with insufficient protection and inadequate means of legal recourse in the case that a company defrauds them (Allen et al., 2002; Bruton et al., 2002b).

Whilst, these shortcomings hamper stock market investments, they provide an even bigger impediment for venture capitalists – an investor group whose success depends more than that of any other investor group on the ability to monitor and steer the firms they invest in.

2.2.1.1 Culture

Everyone who does business in a foreign country has to be aware of and responsive to that nation's culture. In the Western hemisphere, cultural differences between countries tend to be comparatively minor and businessmen and -women can typically adjust to another nation's culture without major difficulties. When setting foot into China, however, it is easy for Westerners to become overwhelmed by the cultural differences they suddenly face. These differences not only require personal adjustments in one's lifestyle and the way we interact and communicate with others while working abroad, they also necessitate substantial modifications in the corporate decision making process as many standards and routines that are taken for granted in the Western business world may not apply in China. The four most striking Chinese cultural phenomena related specifically to interpersonal relationship are: collectivism, *mainzi* (face), *renqing* (reciprocal favour) and *ganqing* (affection).

Collectivism One of the key aspects of Chinese culture is high degree of

collectivism (Hofstede 1980). From birth onward, people belong to strong, cohesive in-groups, such as extended families. The norms of Chinese interpersonal behaviour clearly distinguish in-group from out-group people, such as strangers. For in-group relationships, in which expressive ties are predominant, Chinese people pay more attention to attachment, harmony, and long-term relationships by going along with the group and avoiding rejection (Hui and Triandis 1986). For out-group relationships, in which instrumental ties are predominant (Bond and Smith 1996), people distrust one another; are “on guard against everyone and on all occasions”; and “treat each person like a guest, but guard against him like a thief” (Chiao 1989, qtd. in Gabrenya and Hwang 1996, p. 310). Moreover, Fukuyama (1995) categorizes Chinese society as a low-trust society in which its citizens tend to distrust out-group people and trust only in-group people.

In a country like China, whose culture shows a strong collectivistic orientation, employees tend to share responsibility within an organization. That is, it is rare for an individual to be responsible for an activity; instead there is an emphasis on collective actions across all levels in a firm’s hierarchy (Boisot and Child, 1988; Bruton et al., 2002b). For Western business people, that means that negotiations and routine communications will rarely take place on a one-on-one basis, but will typically entail communicating with several individuals who share responsibility for a given task.

Mainzi (face) Another key aspect of Chinese culture is mainzi (face). Mianzi refers to a person’s claimed sense of positive image in a relational context, and it is gained by performing one or more specific social roles that are well recognized by others (Bond 1991). Face describes a person’s proper relationship with his or her social environment, and its importance lies in the consequence of living in a society that is conscious of social contexts (Hofstede 1992). A loss of face brings

shame to people and their family, and causing others to lose face is considered an aggressive act by those whose face has been discredited (Tung and Yeung 1996).

The Chinese idiom “would rather make sacrifices than lose face” illustrates the importance of face. Because it is so important in the personal life of Chinese people, members of in-groups protect the other members’ face (Bond 1991). Face is important not only for Chinese people’s personal lives but also for their business lives. Redding and Ng (1982) find that Chinese businessmen claim that face is a consistently important consideration in their professional interactions and that fear of losing face forms the basis for the informal system of contracts and agreements that are common in Chinese business. They also find that for middle level business executives in Hong Kong, face has a significant influence in business negotiations. To give face to someone during a business negotiation is perceived as highly desirable, whereas to jeopardize or challenge the other’s face is considered highly undesirable.

The norm of preserving face in Chinese society encourages people to play proper social roles, to meet the requirements of and to be liked by peers of the same affiliated group, and to allow all members to appear good in the group (Lee and Dawes, 2005). As a result, conflicts within the group are reduced, and harmony is enhanced. Therefore, in Chinese interpersonal relationships, face has a function that is instrumental in the stabilization of the group.

Renqing Reciprocal favour in Chinese is called *renqing*. Reciprocal favour is a strong social norm in Chinese society. If a personal relationship partner gets into difficulties, the other partner should help him or her, and after the recipient has received the favour, he or she should return it as soon as the opportunity arises (Hwang 1987). Reciprocal favour is morally binding for Chinese people, and those

who do not repay favours are considered to have “no credibility,” to have “no conscience,” and to be “mean,” and they lose face, reputation, and ultimately personal relationships and their peers’ trust. The norm of reciprocal favour requires that all members of a group perform favours to help those in need and that all favours be repaid.

The rules of reciprocal favour require certain social behaviour in Chinese culture (Hwang 1987). First, in normal times, a person should keep in contact with acquaintances in his or her Guanxi circle by greetings, visitations, or exchanging gifts with them from time to time. Second, when a person in a network gets into trouble or faces a difficult situation in life, other members of the group should sympathize with and help that person and do a renqing (offer favour or help); after the troubled member has received a renqing from others, he or she should return it as soon as the opportunity arises. Reciprocal favour has several implications in Chinese culture (Hwang 1987). First, it indicates the emotional or affective responses of a person who is confronting various situations or life events. Second, it is a resource that a person can present to another as a gift in the course of social interaction. Third, it connotes the social norms by which a person must abide to get along well with others. Reciprocal favour, with its rules and implications, facilitates the survival of each person in the group and thus the survival of the group. Reciprocity is a universal concept and rule; it is even applicable to animal behaviour (Axelrod 1984).

Ganqing (affection) Ganqing (affection) refers to human feelings and is related to enduring and emotional commitments that are found in long-term and intimate social bonds, such as those between parents and their children, close friends, and teachers and students (Yang 1994). Ganqing is the most important foundation of Guanxi, and it is so critical that Chinese people tend to mix the word Guanxi with

ganqing, sometimes using the words interchangeably. Notably, Chinese people tend to differentiate between two types of friendship. One is based on deep mutual ganqing and a willingness to sacrifice materially for a friend, and the other consists of an affected ganqing and is established for the purpose of enabling mutually beneficial material exchanges. However, even when two “friends” desire only a mutually beneficial exchange, they still find that it is necessary to affect ganqing. In both types of friendship, ganqing and mutual indebtedness go together (Kipnis, 1997).

2.2.1.2 Guanxi

Researchers defined Guanxi as a web of extended family relationships (Kipnis 1997), a cluster of patron-client exchange relationships for instrumental purposes (Walder 1986), particularistic relationships which built simultaneously for the sake of the relationship and instrumental purposes (Lin, 2001b), and special relationships due to the existence of particularistic ties (Tsui et al. 2000, Yeung and Tung, 1996). Guanxi is ubiquitous and comes in many varieties. In many cases it is the only insurance that transactions will go through. According to Tsang (1998), Guanxi can serve as a resource that can be called on when needed but also represents a liability when a favour is owed. When maintained and employed properly, Guanxi with key individuals both inside and outside one’s organization can be used efficiently to create value both for the venture capitalist organization itself as well as the firm it funds. Another characteristic of Guanxi is that they are driven by unwritten social rules. While business transactions in the West are typically based on carefully worded contracts that are enforceable under a country’s laws and regulations, China’s legal system provides comparatively less protection if things go sour. As a result, Chinese business partners rely more heavily on the social responsibilities that come with a well-maintained Guanxi relationship. Because collectivism, mainzi (face), renqing (reciprocal favour) and

ganqing (affection) are manifestations of Chinese personal relationships, closer Guanxi between two partners (in this case, between a venture capital firm and a technology-based firm) helps their relationship move toward in-group-like relationships, thus fostering more trust (Fukuyama 1995).

Yang (1994) categorizes Guanxi in China into three groups: (1) between family members; (2) between familiar people, such as neighbours, friends, and colleagues; and (3) between strangers or mere acquaintances. These three categories of relationships have completely different social and psychological meanings to the parties involved and are governed by different sets of interpersonal rules. This classification is consistent with that of Hwang (1987), who argues that the relationships of family members primarily consist of expressive ties, strangers of instrumental ties, and familiar people of mixed ties. We place these three kinds of Chinese interpersonal relationships on a continuum of Guanxi; the family Guanxi is on the right extreme (primarily with expressive ties), the stranger Guanxi is on the left extreme (primarily with instrumental ties), and the familiar person Guanxi floats in the middle (with mixed ties). For Chinese people, when they talk about Guanxi, they often imply an interpersonal relationship outside of the family, primarily with a familiar person, because between family members, the relationship is unalterably that of an expressive tie, and obligations are dutifully assumed (Kipnis 1997, p. 184).

Our focus of venture capital and entrepreneur relationship falls into the acquaintance category. In such relationships, the norm of renqing (reciprocal favour) prescribes some expectations of both expressive and instrumental exchanges (Chen and Peng, 2008). Expressive exchanges between venture capital and entrepreneur can be manifested by non-job related incidents, such as having dinner, playing games, or watching movies together, or helping out one another

with personal problems. Instrumental exchanges can be manifested by helping to solve job related problems, cooperating at work, communicating honestly with each other about problems or conflicts between work colleagues, and so on. In addition, the practices of Chinese organizations also cultivate the mixed working Guanxi. For example, many Chinese organizations hold regular birthday parties and organize vacation trips for their employees. They also provide financial or personnel help in the case of employees' family crises. Therefore, a close work Guanxi in China consists both the expressive and instrumental components. Brutona and Ahlstrom (2003) found that venture capital investment in China indeed involves frequent personal interaction.

To gain insight into how Chinese managers understand the meaning of Guanxi, Lee and Dawes (2005, p:32-33) interviewed about a dozen sales managers in China. One of these Chinese managers gave them a striking description of Guanxi that summarizes its essence: "Guanxi is just like door steps. If you're not yet on the steps, no one will do business with you. If we don't know you, how can we trust you! Once you're on the door steps, then we start to know you, then we open the door to talk business with you." This description of Guanxi reveals three things: First, Guanxi is a formality, a necessary procedure that businessman must go through for strangers to establish intention to conduct business with one another. In short, with no Guanxi, there is no intention. Second, there is a threshold level for Guanxi below which strangers remain strangers. Third, the establishment of Guanxi may take time. It is unlike the United States, in which strangers can immediately begin talking business after they are introduced by a third person (Lee and Dawes, 2005).

Moreover, Kipnis (1997) points out that the production of Guanxi simultaneously creates human feeling and material obligation; therefore, in Guanxi,

feeling and instrumentality are a totality. Guanxi unifies what Western bourgeois relationships separate, namely, material exchange and affectionate feelings. In Western countries, “business is business”, i.e. business cannot be mixed with affection. The former is self-interested and is governed by contracts and rules of the market; the latter is pure and altruistic, governed by spontaneity, and above economic consideration (Kipnis, 1997). However, in China, business and affection go together. Historically, Chinese firms arose in legal contexts in which property rights and contract law were unreliable. Therefore, the cultivation of long-term, reliable Guanxi and the adoption of a Guanxi-oriented management style build the trust that is necessary to conduct business transactions and are essential for survival (Redding, 1990).

Taken together, these studies suggest China’s political, economic and social institutions influence the characteristics of China’s venture capital firms and their relationship with investees. As Chinese managers have a cultural propensity and institutional imperatives to rely on Guanxi (Luo and Che, 1997; Boisot and Child, 1996; Peng and Heath, 1996; Child, 1994: 150), China represents an ideal research laboratory in which to explore the inter-organizational relationships. In the next section, extant research on venture capital is reviewed.

2.3 Extant Research on Venture Capital

2.3.1 Technology-Based Firms and Inter-organizational Relationships

Technology-based firms have been argued to be highly dependent on resources available through inter-organizational relationships (Jarillo, 1989; Stinchcombe, 1965; Yli-Renko et al., 2001b). Technology-based firms usually operate in fields requiring substantial resources but typically have very little resources themselves.

The objective often being rapid growth, technology-based firms are forced to use external resources and form rapidly new business partnerships and customer relations (Autio and Garnsey, 1997; Jarillo, 1989; Pfeffer and Salancik, 1978). The new partner, e.g. venture capital firm, can usually provide all the external resources technology-based firms need, but new partner's goal is protecting his investment and seeking better return. As a result, the external resources provider usually undertakes a number of activities to address problems relating to asymmetric information.

Technology-based firms may have various kinds of inter-organizational relationships. There is a large body of literature examining the relationships of entrepreneurial firms with their venture capitalists. Summarizing previous research, there are two main approaches: (1) principal-agent relationship approach (from venture capitalist's point of view) (Mitchell et al., 1992; Sapienza and Gupta, 1994; Gifford, 1995; Bergemann and Hege, 1998; Reid, 1998, 1999; Kaplan and Stromberg, 2003), and (2) resource dependence approach (from entrepreneur's point of view) (MacMillan et al., 1988; Sapienza, 1992; Sapienza et al., 1996; Sapienza and Korsgaard, 1996; Deeds and Hill, 1996; Eisenhardt and Schoonhoven, 1996; Rothaermel and Deeds, 2001; Schoonhoven and Lyman, 2000; Shan et al., 1994; Stuart et al., 1999; Stuart, 2000).

2.3.1.1 Inter-organizational Relationships between Venture Capital and Technology-Based Firms

Many researchers examined the relationship between venture capital and technology-based firms within an agency framework, with the venture capital investor acting as principal, and his investee company as agent (Mitchell et al., 1992; Sapienza and Gupta, 1994; Gifford, 1995; Bergemann and Hege, 1998; Reid, 1998, 1999; Kaplan and Stromberg, 2003).

The nature of the principal-agent relationship assumes that the principal is the lead player (Jensen and Meckling, 1976; Fama, 1980). As agents usually have superior knowledge about their firm, the principal will attempt to control the relationship by the input of resources and by employing agents to work on his behalf. As the principal requires reassurance that his resources are being utilised to his best advantage (Fried et al., 1998), principal will set up a mechanism of monitoring and control. However, in venture capital, the principal will not always be around to oversee the actions of his agent(s). The agent, on the other hand, will receive a payoff for working on behalf of the principal. If this were to be in the form of a fixed amount, then the agent might be tempted to exert only minimum effort; without additional incentive, there is nothing to be gained by doing more than is necessary. Thus a moral hazard will arise and with an absent principal, the agent relaxes and works to a sub-optimal degree.

There are steps that can be taken to attenuate the problems of information asymmetry and moral hazard that can arise in a principal-agent relationship (Fama, 1980). In order to maximise the outcomes of such a relationship, the principal can set in place monitoring systems such that the agent has an incentive to work for the good for the partnership. There are two main mechanisms that venture capital firms conduct to control relationship with technology-based firms: formal monitoring and informal monitoring (Pruthi, Wright, Lockett , 2003).

Formal monitoring, which refers to the specified formal contractual conditions (Pruthi, Wright, Lockett , 2003), is the foundation of the relationship between venture capital firms and their technology-based investees. These contract terms specify the rights of each agent in the organization, performance criteria on which agents are evaluated, and the payoff functions they face (Fama and Jensen, 1983).

Venture capital firms can specify contractual conditions that place restrictions on management's behaviour. The conditions include on capital expenditures, restriction on managerial salaries, restriction on raising additional outside capital, technology non-disclosure agreements, and conditions for forcing a change in managing and liquidating the deal, etc. (Barney and Lowell, 1994; Kaplan and Stromberg, 2001).

Informal monitoring is another important reason for venture capital firms to enter into relationships with technology-based new firms. After signing a contract, venture capitalists keep a close relationship with their portfolio companies and are involved in these companies' operations. These involvements help to protect the interest of the venture capital firm, ameliorate the problems of information asymmetry and increase the likelihood of higher return on investment (Sahlman, 1990). For instance, venture capitalists regularly meet with entrepreneurs. According to Gorman and Sahlman (1989) survey, venture investors spend 100 hours in direct contact (on site or by phone) with the company.

For technology-based firms, the motivation for engaging in inter-organizational relationships with other organizations is to access resource and knowledge. The form of relationship with outside organizations is evolving dynamically with the growth of the firms. Research on strategic alliances (e.g., Kogut, 1988) or strategic networking (Gulati, Nohria and Zaheer, 2000) has long suggested that the need for resource and knowledge is a major rationale for alliance/network formation. Strategic alliances/networks provide opportunities for partners to share resources and learn from each other.

For emerging firms, the social network of the entrepreneur is virtually synonymous with the network of the firm, as network ties initially exist on the

interpersonal level (Hite and Hesterly, 1999, 2001). Emerging firms typically leverage entrepreneurs' existing ties such as family members and friends to gain the key resources needed to establish firm viability (Bhide, 1999; Hite and Hesterly, 2001; Johannisson, 2000). Ostgaard and Birley (1996) assumed the personal networks of the owner-managers to be the most important resources upon which the owner-managers can draw in the early days of the firm's development.

As emergent firms evolve into growth firms, their networks evolve from identity based, existing ties of the entrepreneur to more calculative relationships based on assessment of economic costs and benefits (Hite and Hesterly, 2001). Firms in different life cycle stages have different strategic challenges. In their attempt to respond to new strategic challenges and resource access needs, evolving firms develop new inter-organizational relationships to match the needs (Hite and Hesterly, 2001). When moving into the early-growth stage, firms make clear strategic decisions to grow intentionally beyond mere survival (Churchill and Lewis, 1983; Hite and Hesterly, 2001; Kazanjian and Drazin, 1989). In this stage, a more extensive and broader set of resources is needed to enable growth. During the early growth stage, the search for external resources, and the building of inter-organizational relationships to access them, becomes more intentional and calculative. Instead of leveraging resources from their families and friends, early growth stage companies often seek external financing from venture capitalists and other investors, and form alliances with other companies. However, not only does lack of resources constrain the growth of technology-based firms, they are also limited by their competencies and knowledge of the markets and customer needs. The knowledge access is another important reason for technology-based firms to enter into inter-organizational relationships (Almeida et al., 2001; Liebeskind et al., 1996; McGee and Dowling, 1994; Powell et al., 1996; Yli-Renko et al., 2001a).

Two broad categories cover most of the reasons why technology-based firms establish inter-organizational relationships: access to resources, and access to knowledge through inter-organizational relationship.

Access to resources is an important reason for entrepreneurial technology-based firms to engage in inter-organizational relationships with other organizations (De Meyer, 1999; Eisenhardt and Schoonhoven, 1996; Hite and Hesterly, 1999, 2001; Jarillo, 1989; Park et al., 2001). Resources accessed through inter-organizational relationships may include simple resources, e.g. financial, which are often sought from venture capitalists. Resources obtained through inter-organizational relationships can also include access to distribution channels and production facilities or something else that is needed to create, produce and distribute the products competitively (Stearns, 1996).

Access to knowledge is another important motivation for technology-based new firms to enter into relationships with external parties (Almeida et al., 2001; McGee and Dowling, 1994; Powell et al., 1996; Yli-Renko et al., 2001a). Technology-based firms need external knowledge to focus their scarce resources to the most effective use and to develop their competencies and organizations. According to the knowledge-based view of the firm, the partnership between venture capital firm and entrepreneur can be understood as a social and therefore also collaborative community specialising in the speed and efficiency in the transfer and creation of knowledge across their borders (Almeida et al., 2002; Kogut and Zander, 1996). For instance, new firms are known to seek venture capital financing and select venture capital investors on the basis of strategic advice they believe to get from the investors (Smith, 2001). Strategic advice has been confirmed as the most important form of hands-on value-added that entrepreneurs gain from their venture capital investors (Sapienza, 1992; Sapienza

et al., 1994; Sapienza et al., 1996).

Having discussed the inter-organizational relationship between two parties, it is useful to mention that building a good inter-organizational relationship is very important and critical because all the venture capitalist's roles in the investee companies will rely upon this relationship (Maula, 2001). In this context, there is some consensus between previous studies regarding this issue (Tyebjee and Bruno, 1984; Timmons and Bygrave, 1986; Gorman and Sahlman, 1989; Sweeting, 1991; Sapienza, 1992; Sapienza, 1996; Boocock and Woods, 1997; Sweeting and Wong, 1997). All these studies mentioned that once the deal is completed, the relationship between the two parties must work because the role of the venture capitalist has transferred from being a mere investor to a collaborator. The structure of a relationship has built depending on converge of the interest for both parties which all should look for the further growth and development of the company. This interest converge is similar to the concept of "expectations of continuity of a relationship," because both capture the likelihood of future interactions (Noordewier et al., 1990). Nevertheless, long-term orientation encapsulates the desire of the parties toward a long term relationship. According to Ganesan (1994), trust based on good relationship is a necessary antecedent for long-term orientation because it shifts the focus to future conditions. A venture capitalist's trust in the entrepreneur affects the long-term orientation of the venture capitalist in two ways: (1) it reduces the perceived risks associated with opportunistic behaviours by the entrepreneur, and (2) it reduces the transaction costs in an exchange relationship (Lee and Dawes, 2005). Therefore, an informal, open and mutual inter-organizational relationship is very important for venture capital investment.

2.3.1.2 Inter-organizational Relationships between venture capital and technology-based firms in China

Inter-organizational relationships in China have all the common characters discussed in the previous section although the relationship is much more intensive than that in Western countries. Backman (1995) and Weidenbaum and Hughes (1996) examined standard buyer/seller relationships in Asia and note that they are much closer than in the West. Their results are in line with an earlier study by Kao (1993), who pointed out that when a Chinese entrepreneur enters into a business deal, he is not just interested in the economics of the contract, but also in the relationship it represents. Indeed, Chinese businessmen generally anticipate that their commercial dealings will result in more than a formal legal relationship – they expect their business partners to provide them with personal and equity links and extended interconnected networks (Gerlach, 1992).

Furthermore, Chinese culture is hierarchical (Hamilton 1991); a firm is usually tightly controlled by the top boss and a few senior managers (Redding and Wong 1986). Because Chinese firms adopt a Guanxi business style, the person is the firm, and the firm is represented by the person. Thus, the closeness of the inter-organizational relationship to a portfolio company is primarily determined by the Guanxi between venture capitalists and top boss and senior managers in the company.

Research on venture capital inter-organizational relationship in China has not emerged until very recently. Bruton et al. (2002b) argue that this close inter-relationship culture affects venture capitalists as well. When examining the interactions between venture capitalists and the CEOs of the firms they fund, Bruton et al. (2002b) find that, in the West, the time a venture capitalist spends in face-to-face contact with the firm's CEO generally varies with the perceived risk

of the funded venture. That is, the riskier a firm is perceived to be, the more time the venture capitalist will devote to monitoring his investment (Sapienza et al., 1996; Bruton et al., 2004). In contrast, Chinese venture capitalists frequently maintain contacts not only with the CEO, but with a wider range of top and mid-level managers (Pukthuanthong and Walker, 2007). Indeed, after conducting extensive interviews with venture capitalists in East Asian countries – many of them in China – Bruton et al. (2004) found that effective monitoring in these countries is only possible if a venture capitalist builds personal relationships with funded entrepreneurs. They argue that as a result, Western venture capitalists have to be aware that the time, effort, and costs they will have to spend in an effort to monitor a firm effectively will be significantly higher in China than what they are used to in the West. This is in line with earlier findings by Bruton et al. (2002b), who show that the number of years the funded venture has been in the venture capital firm's portfolio is negatively related to the amount of time the venture capitalists devote to the funded venture in the USA and Europe. On the other hand, they document that the factors are unrelated in China.

In the following chapters, we will examine some of the most relevant fields of research related to relationships (Guanxi) between technology-based firms and their venture capital investors. We will first discuss the extant research on venture capital in Western countries. Mainly, we will review two main areas of research: venture capital monitoring and venture capital value-added. Thereafter, we will focus on extant research on venture capital developing countries, particularly in China, which we believe is offering a fascinating example for better understanding of the important dimensions in the relationships between venture capital and their portfolio companies. We will employ the findings from these related, but more extensively researched fields, in developing hypotheses about the important factors to be considered in research on venture capital and their portfolio

companies.

2.3.2 Venture capital monitoring

Each year venture capitalists screen hundreds of investment proposals before deciding which ideas and team to support. It is important to choose the right entrepreneur and project, but that is not the end of a venture capitalist's job. In his case study, Gupta (1986) attributed the venture capital's success to its hands-on involvement in the management of its portfolio companies—recruiting managers, monitoring companies' performance, sitting on the boards of directors, regular meeting with entrepreneurs, providing a range of expertise, including operations, technology, finance, etc. Thus, an appropriate monitoring mechanism along with value-added ensures a rewarding relationship during the investment period.

The purpose of the monitoring of venture capital firms is to respond to warning signals. These signals are late payments, losses, late financial reports, poor financial reports, large changes in balance sheet, significant changes in management, sales, inventory changes, and changes in accounting methods, etc. responding to these signals, venture capitalists can take remedial action before serious trouble infects the investee company (Gladstone, 1983, 1988).

Summarizing previous research on the venture capital monitoring on technology-based firms, there are two main monitoring approaches venture capitalists take to mitigate agency risk: For formal monitoring, venture capitalists structure a formal financial contract between the entrepreneur and venture capital firm to provide incentives for the entrepreneur to behave optimally. For informal monitoring, venture capitalists can engage in information collection and monitoring through the activities that are not clearly codified in a formal contract, i.e. residual rights of control that are bestowed through ownership and monitoring

through personal interactions (Grossman and Hart, 1986; Hart, 1995).

2.3.2.1 Formal Monitoring

In the jargon of economics, venture capital contracts are incomplete. Venture capitalists are entered into in uncertain environments, and they fail to exploit even available information (for example, probability distributions) because of two obstacles. First, some information is observable by only one party (the entrepreneur) who cannot credibly communicate it to others (information asymmetry). Second, the parties cannot control post-financing behaviour by contract because either the behaviour itself or future states of the world cannot be verified by third party arbiters (agency problems). These two problems motivate the design of venture capital contracts.

Previous researchers have tested the formal contractual arrangements based on different theories. Embedded in the organizational economics paradigm, Barney and Ouchi (1986) assumed that contracts between new firms and venture capital firms are monitoring devices used to manage possible conflicts of interest between these two. Based on transaction cost economics, Williamson (1975, 1985) argued that monitoring is costly, i.e. those contractual covenants are costly to write and enforce, and thus will only be included in a contract if their benefits are greater than their cost of writing and enforcement. Based on agency theory, Jensen and Meckling (1976) declared that the need to write and enforce contractual covenants is partly a function of the probability of opportunistic behaviour occurring in a relationship: The greater the probability of particular types of opportunism, the greater the need for monitoring and controlling that behaviour, and thus the more likely particular covenants will be included in the contract.

Following Jensen and Meckling (1976), most of research on formal contract

agreements has been based on principal-agency approach. For example, Holmstrom (1979) assumes that the agent's effort is unobservable to the principal, and the optimal incentive contract ensures that the agent puts in enough effort by making the agent's compensation dependent on the outcome of the signals. In the context of a financing problem, the signal is typically output or profits. Harris and Raviv (1979) show that with a risk-neutral principal and agent, and no wealth constraints, the optimal financing contract is to give a fixed payment to the investor and make the manager the residual claimant. These theories stress the importance of providing monetary incentives or cash flow rights to the entrepreneur, and ownership is relevant only as it affects pure cash-flow rights.

Whereas the research described above analyzes general financial contracts, a number of other papers focus specifically on venture capital contracts. Previous venture capital contracting papers may be categorized into two groups, namely, empirical research indicating the prevalent use of convertible preferred equity, staging finance, syndication, and various control rights, etc. (Sahlman, 1990; Lerner, 1994; Gompers, 1995, 1997; Bergmann and Hege, 1998; Gompers and Lerner, 1999; Kaplan and Strömberg, 2002); (2) Theoretical research explaining the optimality of convertible preferred equity in venture capital, and the allocation of various control rights (Sahlman, 1990; Chan, et al., 1990; Berglöf, 1994; Cornelli and Yosha, 1997; Hellmann, 1998; Marx, 1998; Trester, 1998; Bergmann and Hege, 1998; Repullo and Suarez, 1998; Bascha and Walz, 2001a; Houben, 2001; Kirilenko, 2001; Schmidt, 2001; among others).

Summarising the previous research on venture capital contracts, the following findings were obtained:

First, a key feature of venture capital contracts is that they allow venture capitals

to separately allocate cash flow rights, voting rights, board rights, liquidation rights, and other control rights (Lerner, 1994; Gompers, 1995, 1997; Bergmann and Hege, 1998; Gompers and Lerner, 1999). The allocation of control rights between the venture capital and the entrepreneur is a central feature of the financial contracts. This strongly suggests that, despite the prevalence of contingent contracting, contracts are inherently incomplete. This finding gives support to the incomplete-contracting approach pioneered by Grossman and Hart (1986) and Hart and Moore (1990, 1998).

Second, convertible securities are used most frequently in venture capital contracts (Gompers, 1995, 1997; Bergmann and Hege, 1998; Gompers and Lerner, 1999; Kaplan and Strömberg, 2002). Contracts have demonstrated a preference for convertible securities rather than short-term secured credit, the paradigmatic financial security held by banks (Kaplan and Strömberg, 1999; Sahlman, 1990). This contrast is relatively easy to explain. In most countries, including US, Banks are prevented by law from holding equity interests (US CODE: Title 12, Chapter 24 (7)). High-technology start-ups have low liquidation values and volatile going concern values that compel them to offer equity-linked securities to their investors. Venture capitals also implement the same set of rights using combinations of multiple classes of common stock and straight preferred stock.

Third, cash flow rights, voting rights, and control rights are frequently contingent on observable and verifiable measures of financial and non-financial performance (Bergmann and Hege, 1998; Repullo and Suarez, 1998; Bascha and Walz, 2001a; Houben, 2001; Kirilenko, 2001; Schmidt, 2001). These rights are allocated such that, if the company performs poorly, the venture capitalist obtains full control. As company performance improves, the entrepreneur retains/obtains more control rights. If the company performs very well, the venture capitalist

retains their cash-flow rights but relinquish most of their control and liquidation rights. Ex ante, the investors are likely to be in control in more states of the world for early-stage ventures that have not yet started to generate revenues, while previously successful entrepreneurs get to retain more control in their new ventures. This is most supportive of theories that predict shifts of control to investors in different states, such as Phillippe Aghion and Patrick Bolton (1992) and Matthias Dewatripont and Jean Tirole (1994).

Fourth, one of key characteristics in venture capital financing are staging the commitment of capital and preserving the option to abandon the project. Instead of providing all the necessary capital upfront, venture capitalists invest in stages to keep the project under control. Staged investment allows venture capitalists to monitor the firm before they make refinancing decisions. The information about the viability of a project acquired through such monitoring helps venture capitalists to avoid throwing money at bad projects. It reduces losses from inefficient continuation and creates an exit option for venture capitalists. Further, by monitoring and credibly threatening termination, venture capitalists also have better control over potential moral hazards. Gompers (1995) provides an empirical study on the factors affecting the structure of staged financing when moral hazard exists. He shows that in financing high-risk companies with pervasive moral hazards, staged financing allows venture capitalists to gather information and to monitor the progress of projects while maintaining the option to quit.

Fifth, in line with the holdup problem explored in Hart and Moore (1994), venture capital contracts normally include non-compete and vesting provisions that make it more expensive for the entrepreneur to leave the firm, thus mitigating the potential holdup problem between the entrepreneur and the investor.

Taken together, these studies suggest that, like all investors, venture capital firms structure financial contracts (i.e. the allocation of cash flow and control rights) between the entrepreneur and investor to provide incentives for the entrepreneur to behave appropriately. These contractual arrangements specify the rights and obligations of both managers and venture capitalists throughout their entire relationship in a series of covenants (Fiet, 1991). There are some special venture capital features: (1) separately allocate control rights, (2) frequently use convertible securities, (3) control rights are usually contingent on observable and verifiable measures, (4) staging the commitment of capital, and (5) generally include non-compete and vesting provisions.

2.3.2.2 Formal Monitoring in China

The current literature on venture capital generally assumes a strong institutional environment: namely mature market intermediate institutions, friendly government regulations, and an independent judicial system. However, these conditions are normally not satisfied in developing countries (Zeng, 2004). There is no rigorous empirical research on venture capital formal monitoring in China so far, while a number of researchers did argue that China's formal institutional constraints such as laws and regulations are relatively weak compared to Western countries and the effect of formal monitoring may be subdued (Bruton et al. ,2004; Zeng, 2004).

2.3.2.3 Informal Monitoring

Unlike investors in listed companies, venture capital firms are also quasi-insiders in a firm with concentrated ownership. With their specialist skills and significant equity block holding, they have both the skills and incentives to become active investors (Wright and Robbie, 1998) which include exerting costly effort to improve outcomes (Kaplan and Stromberg, 2001). No contract between an entrepreneur and a venture capitalist can anticipate every possible disagreement or

conflict. Partly for this reason, the venture capitalist typically plays a role in the operation of the company and monitors portfolio firms informally, which helps to protect the interest of the venture capital firm, ameliorate the problems of information asymmetry and increases the likelihood of higher returns on investment (Sahlman, 1990).

Board membership and frequent board meetings Kaplan and Stromberg (2001) argued that board membership and frequent board meetings can be important means by which venture capital firms can exercise control and influence on investees apart from formal contract control. Lerner (1995) analyzed 271 venture capital-backed biotechnology firms finding that venture capitalists representation on the board of directors increased around the time of the chief executive officer's turnover, while the number of other outsiders remained constant. Lerner (1995) argued board membership may be important to gain greater access to management information and to effect closer monitoring of management.

Regular meeting with entrepreneur Regular meetings with the entrepreneur can be another important way by which venture capital firm can monitor portfolio companies informally. Gorman and Sahlman (1989) found that lead venture investors visit each portfolio company an average of 19 times per year, and spend 100 hours in direct contact (on site or by phone) with the company. Since each venture capitalist in the survey is responsible for almost nine investments and sits on five boards of directors, the allocation of time to each portfolio company is considerable (MacMillan et al., 1989; and Timmons, 1987). Gomez-Mejia (1990) noted that many venture capitalists use informal meetings because it provides an important chance for exchange of information between two parties.

Taken together, venture capitalists sit on boards of directors, hold full board

meetings, and regularly meet with entrepreneurs. They are sometimes also willing to take over day-to-day operations themselves. All of these activities are designed to increase the likelihood of success and improve return on investment: they also protect the interests of the venture capital firms and ameliorate the information asymmetry.

2.3.2.4 Informal Monitoring in China

Bruton et al. (2004) found venture capital monitoring in China is done much more informally via personal interactions with the entrepreneur. Some of the informal monitoring approaches used in the West are relevant, while other different circumstances and practices in China compel venture capitalists to monitor investments differently, specifically focusing on building a relationship with the entrepreneur for which the project is funded.

Board membership and frequent board meetings In Western countries, venture capitalists typically conduct their monitoring activities through a membership on the firm's board of directors (Sapienza, 1992; Fiet, 1995; Bruton and Ahlstrom, 2003). However, Low (2002) found that venture capitalists do not always have a board seat in China and even if they do obtain a board seat, it typically does not provide them with the same benefits they enjoy in the West. Furthermore, Bruton et al. (2004) note that, in China, information is often withheld from the board and the influence of outside directors remains weak. In addition, Bruton et al. (2004) quote several venture capitalists who have invested in China and report that it is not uncommon for the minutes of board meetings to be written before the meeting has actually started, complete with ready-made quotes from that venture capitalist.

Regular meeting with entrepreneur Frequent interaction with the firm is a typical requirement for venture capital monitoring in West. When monitoring a funded

firm in China, venture capitalists must be even more diligent. Venture capitalists are well advised to build an extensive Guanxi that will allow them to acquire the information they need to monitor the entrepreneur (Bruton and Ahlstrom, 2003; Pukthuanthong and Walker, 2007). A close personal relationship with the entrepreneur and gaining the entrepreneur's trust is the key for informal monitoring. Once they have developed such a relationship, they are much more likely to obtain the information they require and can feel more assured that the information is indeed accurate. Such trust between the funded firm and the venture capitalist is consistent with the nature of communication between parties in Chinese culture. In this cultural setting there are typically clear insiders and outsiders (Goa, Ting-Tooney, and Gundykunst, 1996), and the flow of information to outsiders is severely restricted.

Taken together, since some of the traditional means to monitor the funded firm in mature economies such as formal contract and board membership may provide fewer insights in China, venture capitalists are advised to frequent meet with entrepreneurs and build a closer Guanxi with them.

Conclusions from Research on Monitoring for Ventures in Venture Capital

The previous studies indicate that venture capital firms attempt to mitigate principal-agent conflicts in two ways suggested by theory: through sophisticated formal contracting and close informal monitoring. In formal contract, venture capitalists allocate rights in order to facilitate monitoring and minimize the impact of the identified risk factors (e.g. by allocating more control to investors when management is weak) or make founder cash-flow rights and release of funds contingent on management actions. After signing the formal contract, venture

capital firms informally monitor their portfolio companies very closely to increase the likelihood of success and improve return on investment.

However, monitoring in China proved to be even bigger challenge for venture capitalists. Firstly, formal contracting may be subdued as its eventual enforcement is often difficult in the fact of underdeveloped regulatory institutions, a comparatively weak court system, and insufficient commercial code. Secondly, informal monitoring has to be more active due to the different circumstances and practices in China. Venture capitalists are advised to meet with entrepreneurs frequently and develop a high level of trust between venture capitalists and entrepreneurs.

2.3.3 Venture capital value-added

In the research on the value-added provided by venture capitalists for their portfolio companies, two streams can be identified: (1) different types of value-added provided by venture capitalists, and (2) factors influencing the value-added. In the first stream focusing on the forms of value-added, surveys and other primary data are often employed in order to understand what is really happening in the relationships. The second stream also relies primarily on surveys.

2.3.3.1 Different Type of Value-added Provided by Venture Capital

In one of the earliest studies examining the nature of value-added support provided by independent venture capitalists, Gorman and Sahlman (1989) analyzed 49 venture capitalists and documented a ranked order of the forms of assistance as follows: (1) help with obtaining additional financing, (2) strategic planning, (3) management recruitment, (4) operational planning, (5) introductions to potential customers and suppliers, and (6) resolving compensation issues.

In another early study examining the nature of venture capital value-added, MacMillan et al. (1988) analyzed 62 venture capitalists and reported that activities attracting the highest degree of venture capitalists involvement were: (1) serving as a sounding board to the entrepreneur team, (2) helping the firm obtain alternative further sources of equity financing, (3) interfacing with the investor group, (4) monitoring financial performance, (5) monitoring operating performance, and (6) helping their portfolio firms attract alternative sources of debt financing. Rosenstein et al. (1989, 1993) have also examined the contributions of venture capitalists in the boards of high technology companies. They surveyed 162 high tech firms asking about the same potential categories of value-added as MacMillan et al. (1988) and found that contributions of venture capitalists as a group did not differ significantly from other board members. However, the advice from the board members of the top-20 venture capital firms was valued higher than the advice from other board members or venture capital firms not in the top-20 (Rosenstein et al. 1993). They also found that the areas where CEOs rated outside board members (both venture capitalists and others) as most helpful were in their roles as a sounding board, interfacing with the investor groups, monitoring operating performance, recruiting/replacing the CEO, and assistance with short-term crisis. The help was rated higher for early stage companies than for late-stage companies.

Sapienza et al. (1994) analyzed the differences in the value-added between venture capitalists in UK, France, and the Netherlands in addition to the United States. Corresponding to the findings of U.S. research, they found that strategic roles were viewed as the most important roles by venture capitalists, followed next by interpersonal roles and finally by operational roles. The order was the same in all countries. Continuing the comparisons between United Kingdom, France, the Netherlands and the United States, Sapienza et al. (1996) found, consistent with

prior research, that of the three main value-adding roles (strategic, interpersonal, and networking), venture capitalists viewed strategic involvement (providing financial and business advice and acting as a sounding board) as their most important value-added role. Interpersonal roles (acting as a mentor or a confidant to the CEO) were evaluated as being the second most important in value. Networking roles (i.e. contacts to other firms and professionals) were the third most important. Sapienza et al. (1996) found that these ratings were consistent across the countries. Overall, venture capitalists were most involved and provided the highest value-added in the United States and United Kingdom.

Examining the various value-added roles of venture capitalists using a case-based approach, Steier and Greenwood (1995) carried out an in-depth longitudinal case study of the venture capital financings of a single venture. They found that social endorsement from the first investor superseded business plans in attracting additional financing from new investors. Venture capitalists provided considerable value-added to the entrepreneurial firm giving knowledge, expertise, and experience, as well as funding, to the enterprise. Fried and Hisrich (1995) also employed case methodology in order to create understanding of the relationships of entrepreneurs and their venture capitalists. Based on their interviews of 14 venture-capital financed start-ups, they identified seven areas where venture capital had influence: money, operating services, networks, image, moral support, general business knowledge, and discipline.

Examining the role of venture capitalists certifying the quality of their portfolio companies, Seppä and Maula (2001) employed data from 2,327 venture capital investments in U.S. information and communications technology companies between 1982 – 2000 and found that despite the fact that top venture capitalists are hard to get and require large discounts, prominence of the venture capitalists was

strongly related to future value creation supporting the certifying hypothesis.

Taken together, these studies suggest that venture capital investors add value primarily by advising ventures and by employing their contact network and reputation to open doors for the entrepreneurs.

2.3.3.2 Factors Influencing Value Creation for Ventures in Venture Capital

There are several streams of research examining the factors influencing value-added in venture capital. For instance, Sapienza (1992) surveyed 51 venture capitalist-CEO dyads in order to create understanding of when venture capitalists add value and whether the value-added influences performance. He found that the greater the innovation pursued by the venture, the more frequent the contact, and the more open the communication, the greater was the value of the involvement. Replicating these results in Europe, Sapienza et al. (1994) found that corresponding to the findings of U.S. research, European venture capitalists spent more time and communicated more frequently with highly innovative ventures and early stage ventures. Surprisingly, CEO experience had a positive rather than negative influence on the amount of working hours or frequency of contact. Elango et al. (1995) also examined the amount of value-added provided by venture capitalists and the factors influencing it in their analysis of 149 venture capitalists. They found that the amount of assistance was not strongly related to the target stage of the venture capital firm. Active venture capitalists viewed their involvement as more important. Landström (1990), in his study of the Swedish venture capital backed firms, also concluded that hands-on involvement appeared to be related to better performance of the ventures.

Some studies have focused on the boards of venture capital backed companies

(Fried et al. 1998, Fredriksen and Klofsten 1999). For instance, Fried et al. (1998) analyzed 68 venture capital firms finding that venture capital representation on the board was positively related to board involvement with firm strategy. Fredriksen and Klofsten (1999) surveyed 41 venture capital backed companies finding that firms had better performance where the power over decision-making was equally distributed between the CEO and the board. Openness and trust in the relations between the CEO and the board were posited to have a positive influence on performance.

Applying agency theory, Sapienza and Gupta (1994) examined 51 venture capitalist-entrepreneur dyads and found that the frequency of interaction was shown to depend on the extent of venture capitalist goal congruence, the degree of the CEO's new venture experience, the venture's stage of development, and the degree of technical innovation pursued by the venture. However, the degree of management ownership had no impact on the frequency of interaction.

Sapienza and Korsgaard (1996) examined venture capital value-added from the procedural justice perspective. They carried out a simulation with 44 graduate students and administered a survey answered by 118 U.S. venture capital firms. Corresponding to the procedural justice theory-based hypotheses, timely feedback was found to be important in promoting positive relations between investors and entrepreneurs. In another study examining the influence of procedural justice on the relationships between venture capitalists and entrepreneurs, Busenitz et al. (1998) analyzed 201 venture capital backed firms in the United States and found that the use of covenants and the background of the new venture team influenced the perceived procedural justice in investor relationships.

In a study examining the receptiveness of entrepreneurs for advice from venture

capitalists, Barney et al. (1996) analyzed 205 venture capital backed firms and found systematic differences among new venture teams in their evaluation of learning assistance from venture capitalists. New venture teams with more industry experience and longer team tenure in the current venture were negatively related to both business management advice and operational assistance offered by their venture capitalists. When a new venture team had previously worked together and its primary experience is from another industry, the new venture teams tended to welcome business management advice from its venture capitalist. Business management advice was not highly valued by new venture teams that pursued more technical innovations. Barney et al. (1996) found that current performance was not related to a new venture team's evaluation of venture capital assistance. They concluded that an optimal level of involvement by venture capitalists was contingent on the new venture team's openness to learning.

Higashide and Birley (2002) surveyed 80 venture capitalists about their portfolio companies. Controlling for the agency risk and business risk explanations, they examined the role of cognitive conflict between the venture and the investors on the venture performance. In support of their hypotheses, they found that cognitive goal conflict (disagreement) was positively related to venture performance while affective goal conflict (as personal friction) was negatively related to venture performance. Contrary to their expectations, the level of involvement was negatively related to venture performance. They concluded that the problem might be in the causality, so that the more troubled the venture, the more venture capitalists have to get involved. In another study, Higashide and Birley (2000) examined the same sample from another perspective and found that the quality of information being exchanged between venture capitalists and entrepreneurs was positively related to venture performance. In support of their hypotheses, they also found that the venture capitalist continuance commitment was negatively, and

venture capitalist affective commitment was positively, related to venture performance.

Taken together, these studies suggest some factors that may influence the value-added provided by venture capital investors. Related to the venture characteristics, this research suggests that the younger, less experienced, and riskier the venture is, the more it receives attention from the venture capitalist. Related to the relationship characteristics, the reviewed research suggests that the closer and the more open the relationship is between the venture and the investor, the more the venture benefits from hands-on involvement.

2.3.3.3 Value-added in China

Chinese firms have major incentives to access resource and knowledge and to convert them into effective capabilities. Given their relatively resource-poor conditions, Chinese firms, especially technology-based firms, must access resource and learn knowledge continuously in order to survive in their new competitive environments (Bartlett and Ghoshal, 2000; Dawar and Frost, 1999; Manikutty, 2000; Prahalad and Lieberthal, 1998). As China's market is becoming more open, foreign entrants bring their often considerable skills to the competition. Thus, Chinese firms must develop strong and new capabilities to survive. In addition, many Chinese firms also desire to move into markets outside their home country. In other words, they desire to build capabilities that allow them to compete in global markets, including other emerging markets and eventually in developed markets. To do so often requires that they develop sophisticated managerial and technological capabilities that will allow them to compete effectively in these markets. Venture capital firms provide opportunities for them to access the needed resource and knowledge. In other words, Chinese firms can achieve a strategic advantage if they access complementary resource and

knowledge and create new value to improve their capabilities. In short, there is an increased demand for venture capital value added in China.

However, there is little mention of value-added in previous research on China's venture capital industry. The main reason is that the early venture capital investors were generally passive investors and provided little or no advisory services in addition to their capital (White et al., 2002). Even early foreign venture capital investment tended to be made by China experts rather than venture capital experts. As a result, both venture capitalists and entrepreneurs are still learning how to add value into their funded companies. Only recently, Chinese entrepreneurs are slowly getting accustomed to the fact that an outside investor would want to get so involved in their firms, and managers still seldom seek strategic input from venture capitalists. However, the need for their guidance may be greater than in comparable situations in the West. Venture capitalists are also very keen to reinvent their value-added techniques in Chinese business setting (Ahlstrom et al., 2007).

Nevertheless, all the previous research has emphasised the critical role of Guanxi and the need for different approaches to providing value-added to the funded firms. In Western countries, advice provided to CEOs of funded firms can be very direct and may occur in regular interactions (Fried and Hisrich, 1995). However, in China, when there is a need for managerial input, one of the keys in such situations is to allow managers the opportunity to maintain "face" or respect (Ahlstrom et al., 2007). Thus, closer Guanxi is essential to providing the value-added to the funded firm. Better Guanxi can mediate the conflicts between venture capitalists and entrepreneurs and smooth the progress of value-added.

Taken together, although there is only very limited research regarding venture

capital valued-added in China. All of this research suggests that a close and good Guanxi is crucial for effective value-added in China.

Conclusions from Research on Value added for Ventures in Venture Capital

Many previous studies have found differences and also identified mechanisms through which venture capitalists add value to ventures. The most important forms of value-added by venture capital investors can be synthesized to be in arranging additional financing, supporting strategy making, and recruiting key executives.

Regarding the factors influencing the value-added mechanisms, it has been found that a close relationship is an important factor influencing the extent of value-added delivered by venture capitalists. In line with similar research on Western countries, previous research found that Guanxi plays a critical role to providing value-added to the funded firms in China.

2.4 Applicability of the Theoretical Approaches to the Present Study

The present study will therefore develop a multi-theoretic framework of the mechanisms of monitoring and value-added in inter-organizational relationships and of the key factors, namely Guanxi and complementarities, influencing those mechanisms. The integrative use of several theories in building the models is justified by numerous studies suggesting that a multi-theoretic approach is required to understand the complexity of inter-organizational relationships (Gulati, 1998; Osborn and Hagedoorn, 1997; Park et al., 2001; Smith et al., 1995:19). We believe that the relationships between technology-based companies and their venture capital investors with a mix of strategic and financial objectives are by no

means less complex than other potential inter-organizational relationships and thus require ideas from several theories to be properly understood. In this study, we build the models applying primarily the institutional view, agency theory, asymmetric information theory, resource-based view, and the social capital theory. All these theoretical approaches has been explained in Chapter one in more detail. Next chapter will present the models and hypotheses.

CHAPTER 3

THE ANALYTICAL FRAMEWORK

3.1 Introduction

In this chapter, models and hypotheses on the influence of China's venture capital on the performance of technology-based firms are developed on the basis of key insights gained from the literature review. In the first section, the various potential forms of monitoring and value-added are synthesized to a simple and testable framework of monitoring and value-added mechanisms. The first section argues that venture capital firms monitor technology-based companies mainly in two forms: formal monitoring and informal monitoring and provide value-added mainly in two forms: resource access and knowledge access. The second section develops a model and hypotheses on factors influencing these mechanisms.

3.2 Monitoring Mechanisms

As discussed earlier, uncertainty and informational asymmetries often characterize technology-based firms and there is the need for monitoring to address the agency problem faced by venture capital investors to reduce asymmetric information and constrain opportunistic behaviour by firms' managers. Previous research on the forms of monitoring was reviewed in Chapter 2. In this section, we develop hypotheses on two specific theoretically and empirically grounded monitoring mechanisms that are hypothesized to account for the majority of the supervision provided by venture capital firms. The two forms of monitoring mechanisms are (1) formal monitoring, and (2) informal monitoring. Formal monitoring refers to the specified contractual conditions. Informal mechanisms include all the monitoring activities that are not clearly codified in a formal contract (Grossman and Hart, 1986; Hart, 1995). Formal and informal

monitoring are all hypothesized to be positively related to the accuracy and adequacy of perceived information from portfolio companies, which is the direct intention of monitoring. These two forms of monitoring are hypothesized to account for all the monitoring provided by venture capital firms. These forms of monitoring and the related hypotheses are discussed more thoroughly in the following section. The model on the value-added mechanisms is illustrated in Figure 3-1.

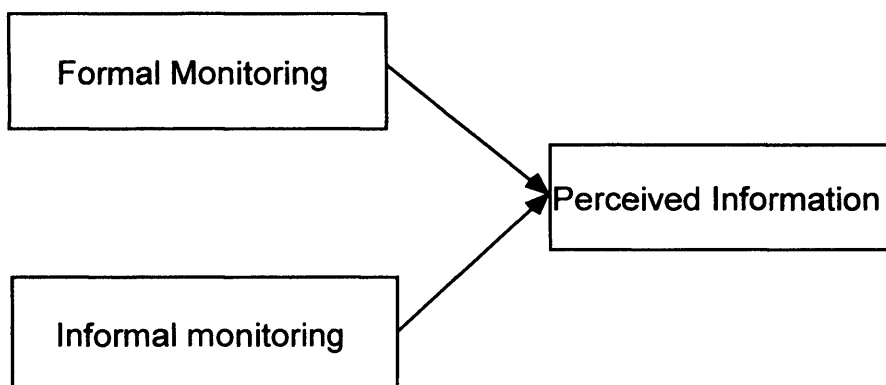


Figure 3-1 Model of the Monitoring

3.2.1 Formal Monitoring and Perceived Information

Formal monitoring refers to the specified contractual conditions such as restriction on management's actions and requirements for the provision of detailed and regular information encoded in a business contract and enterprise's Articles of Association/Corporate Charter. An organization is the nexus of contracts, written and unwritten, among owners of factors of production and customers. These contracts specify the rights of each agent in the organization, performance criteria on which agents are evaluated, and the payoff functions they face (Fama and Jensen, 1983). To deal with agency risk, venture capital firms typically specify contractual conditions that place restrictions on management's behavior. These conditions included restriction on borrowings, restriction on changes in ownership, restriction on mergers and acquisition, restriction on capital expenditure and acquisitions, and restriction on managers' appointments (Kaokab and Stromberg,

2001).

Previous literature has identified two primary approaches on contract research: the optimal contract approach (Hart, 1995), and the incomplete contract approach (Spier, 1992). The first approach relies on the premise that contracts can be complete. More comprehensive contracts can be formulated to influence the behavior of the agent (Pettit and Singer, 1985). While these contracts specify the rights of the contracting parties, stipulation of investee behavior may be more difficult. Spier (1992) argued that it is impossible for principal to know all the potential outcomes and state all contingent terms in a contract which will eliminate all potential agency risks. Similarly, Amihud and Lev (1981) argue that managers may take actions that are in their own best interests and not necessarily those of shareholders. Previous research on incomplete contract all lead to similar conclusions that principal cannot eliminate all the potential agency risks through contract restriction alone due to the bounded rationality of economic agents.

To summarize, we first argued that venture capital firms could ease certain degree of agency risk involved in venture capital investments by using stringent contractual provisions. Subsequently, we introduced some common contractual restriction used by venture capital firms. Afterwards, we explained two primary approaches on contract research. Finally, we argued that formal monitoring is positively related to the accuracy and adequacy of perceived information from portfolio companies. Therefore, we hypothesize:

Hypothesis 1. The higher the level of formal monitoring applied to Chinese portfolio companies, the higher the accuracy and adequacy perceived information received by venture capital firms

3.2.2 Informal Monitoring and Perceived Information

Informal mechanisms include all the monitoring activities that are not specifically codified in a formal contract, such as residual rights of control that are bestowed through ownership and monitoring through personal interactions (Grossman and Hart, 1986; Hart, 1995). As mentioned, stipulation of investee behaviour may be more difficult and it is not possible to write a complete contract due to the bounded rationality of economic agents. These problems which associated with trying to anticipate future contingencies in drawing up the initial contract are well documented (Hart, 1995; Sahlman, 1990). Evidence from bank monitoring relationships (Citron et al., 1997; Holland, 1994) and venture capital firm entrepreneur relationships (Mitchell et al., 1995; Sapienza and Korsgaard, 1996; Steier and Greenwood, 1995; Sweeting, 1991) both suggest that in order to overcome these problems, informal personal relationships or implicit contracts are used in addition to formal contracts. Informal personal interactions are viewed as complementary to formal contracts as they can help build trust and confidence in situations of asymmetric information and uncertainty (Beamish and Banks, 1987).

Furthermore, compared to Western countries, China's formal institutional constraints such as laws and regulations are relatively weak and the effect of formal monitoring may be subdued. Therefore, informal monitoring may play a more important role in facilitating information exchanges and hence assert a more significant impact on monitoring effect. Bruton et al. (2004) find the monitoring is done much more through personal interactions with the entrepreneur who founded the firm in Eastern Asia.

The institutional regulatory environment can also influence the technology-based firm's behaviour. One of the key aspects of the institutional support framework concerns the regulation of financial reporting, which has major implications for

the nature and reliability of the information made available to venture capital firms for monitoring purposes. Accounting rules and reporting standards around East Asia can deviate significantly from international norms (Broadman, 1999; Low, 2000; Peng, 2000). Even in those cases where financial information is produced by one of the established international accounting firms, there can be considerable concerns about the validity of the information presented (Peng, 2000). Therefore, building and maintaining relationships, and locating close to the venture are paramount to monitor the technology-based firm (Bruton et al., 2004).

To summarize, China's relatively weaker institutional and contracting environment may have made it difficult for investor to use contractual restrictions as the sole means by which to solve agency problem efficiently (Zeng, 2004). In order to overcome these problems, informal monitoring is used in addition to formal contracts. We argued that informal monitoring positively related to the accuracy and adequacy of perceived information form technology-based firms which are the main object of monitoring. Therefore, we hypothesize:

Hypothesis 2. The higher the level of informal monitoring applied to Chinese portfolio companies, the higher the accuracy and adequacy of perceived information received by venture capital firms

3.3 Value-adding Mechanisms

In earlier surveys, venture capitalists have been suggested to provide many different forms of value-added services for their portfolio companies. Previous research on the forms of value-added was reviewed in Chapter 2. In this section, we develop hypotheses on two specific theoretical and empirical grounded mechanisms of value-added benefits that are hypothesized to account for the majority of the value-added provided by venture capital firms. The two forms of

value-added are (1) resource access, and (2) knowledge access. Resource access refers to the concrete resources of the venture capital investor start-up company accesses to through the investment relationship. Knowledge access refers to the venture capital firms' various knowledge portfolio company accessed through the investment relationship. Resource access and knowledge access are all hypothesized to be positively related to the value-added activities and are hypothesized to account for most of the value-added provided. These forms of value-added and the related hypotheses are discussed more thoroughly in the following section. The model on the value-added mechanisms is illustrated in Figure 3-2.

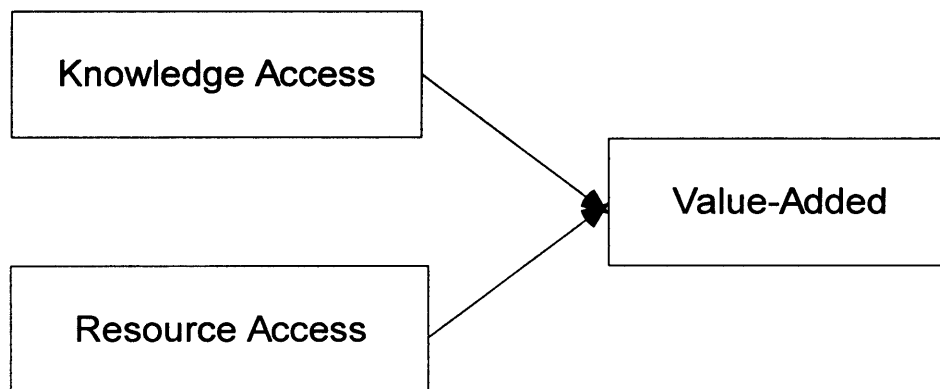


Figure 3-2 Model of the Value-added

3.3.1 Resource Access and Value-added

Various studies on technology-based firms have argued that technology-based firms are highly dependent on their external environment for acquiring the necessary resources (Jarillo 1989, Yli-Renko et al. 2001b). The resource dependence perspective (Pfeffer and Salancik 1978) suggests that firms are dependent on others but try to reduce their dependence. However, Das and Teng (2000) and Park et al. (2001) have argued that inter-organizational relationship is established to create added value through combination of complementary resources. This proactive logic has been explicated by Dyer and Singh (1998) who

suggested that not only are resources inside the company critical for competitive advantage but that non-imitable resources can also be associated with inter-organizational relationships instead of, or in addition to, those controlled exclusively and internally by the benefiting firm.

In relationships between venture capitalists and technology-based firms, the venture capital investor often possesses resources that the venture might be able to access through the relationship including distribution channels, production facilities, research and development, technology, and input products and services at lower cost (Maula et al., 2003). Globally leading venture capital have typically developed broad links with product distributors and research centres spanning several markets, which is rarely the case for small technology-based firms (Almus et al., 1999). Similarly, technology-based firms are often superior in developing technology and new products but inferior in putting the product in large-scale production (Teece 1986). Access to resources of venture capital would therefore be valuable for scaling up the production in many industries.

To summarize, we first argued that technology-based firms could build their competitive advantage not only on the basis of the resources they control themselves, but additionally on the basis of resources available through relationships with venture capital investors. Thereafter, we suggested several forms of potentially valuable, resources of venture capital that a start-up company may potentially be able to access through an investment relationship. Finally, we argued that the resource access is positively related to value-added. Therefore, we hypothesize:

Hypothesis 3. the higher the level of resource Chinese portfolio companies can access through the venture capital investment relationship, the higher the value venture capital firm can add on their portfolio companies

3.3.2 Knowledge Access and Value-added

A wide body of literature has examined knowledge access in inter-organizational relationships between firms (Forrest and Martin, 1994; Lang, 1996; Shan et al., 1994; Yli-Renko et al., 2001a). While there appears to be few empirical research focusing on the value of knowledge access by technology-based firms from their venture capital investors, the existence of learning benefits in venture capital investments has been suggested in previous research on venture capital (Dube, 2000:49; Kelley and Spinelli, 2001; Maula and Murray, 2000; Maula et al., 2001).

The premise for the creation of value through knowledge access is the existence of knowledge. There are good reasons to believe that venture capital firms often possess non-redundant knowledge that might be valuable for technology-based firms. While technology-based firms typically focus on some specific technological area and are very knowledgeable about the specific technology, venture capital firms often have more experience and a broader view (Brander, Amit, Antweiler, 2002). There are various potential areas of knowledge often possessed by venture capital that would be non-redundant and valuable for technology-based firms should they gain access via relationship with their venture capital investors.

Knowledge is the base of firm capabilities and thus, to develop capabilities, firms must acquire the appropriate knowledge stocks and integrate them. Manufacturing capabilities often require specific types and levels of technological knowledge, for example. Marketing capabilities require knowledge of markets and

consumer behaviour as well as promotional activities. Firms in all markets must regularly search for and acquire knowledge to continuously reconfigure their resource portfolio and build new capabilities in order to remain competitive in dynamic markets (Sirmon et al., 2005).

For instance, leading venture capital typically creates very detailed, strategic 'road maps' as to how they see individual technologies and their market potential developing over time (Maula et al., 2001). This intelligence can be of major value to the young firm starting or expanding its sales activities. Thus, access to complementary, strategic information from the venture capital may generate major savings in cost and, critically, time.

Technology-based firms are also often predominantly focused on their technologies and products. However, they can sometimes lack a broader perspective on the market and customer needs (Van Auken, 2004; Rosenstein, 1988). On the other hand, venture capital firms spend large amounts of money on their market research and operate nationally or even globally. From their existing customer relationships, they have a different and deeper understanding of the market needs than a start-up developing a product for future markets. Access to the market understanding of the venture capital firms may be invaluable for a technology-based firm.

Venture capital firms can also provide their portfolio companies with relevant information on competition (Maula et al., 2001). Whereas technology-based firms are focused on their product development, they often have fewer resources for competitor intelligence. Many start-ups also try to avoid publicity until they are ready to launch their products. Venture capital firms often put large resources into competitive intelligence. They understand where other manufacturers are trying to

position themselves in their markets. Access to this kind of information on the competitive situation may be valuable for technology-based firms.

To summarize the above discussion, we first argued the importance of knowledge for the sustainable competitive advantage of the technology-based firm. Thereafter, we described several areas of knowledge, which venture capital firms typically possess, and which can be valuable for technology-based new firms. Finally, we argued that knowledge access is positively related to value-added. Therefore, we hypothesize:

Hypothesis 4. the higher level of knowledge Chinese portfolio companies can access through the venture capital investment relationship, the more value venture capital firm can add to their portfolio companies

3.4 Model on the Role of Complementarities in Monitoring and Value-added

In this section, a model is developed to describe the factors influencing the monitoring and value-added mechanisms. This model focuses on the factors influencing the incentives of the portfolio companies to cooperate with their venture capital investors. This model is illustrated in Figure 3-3 and described in the following sections.

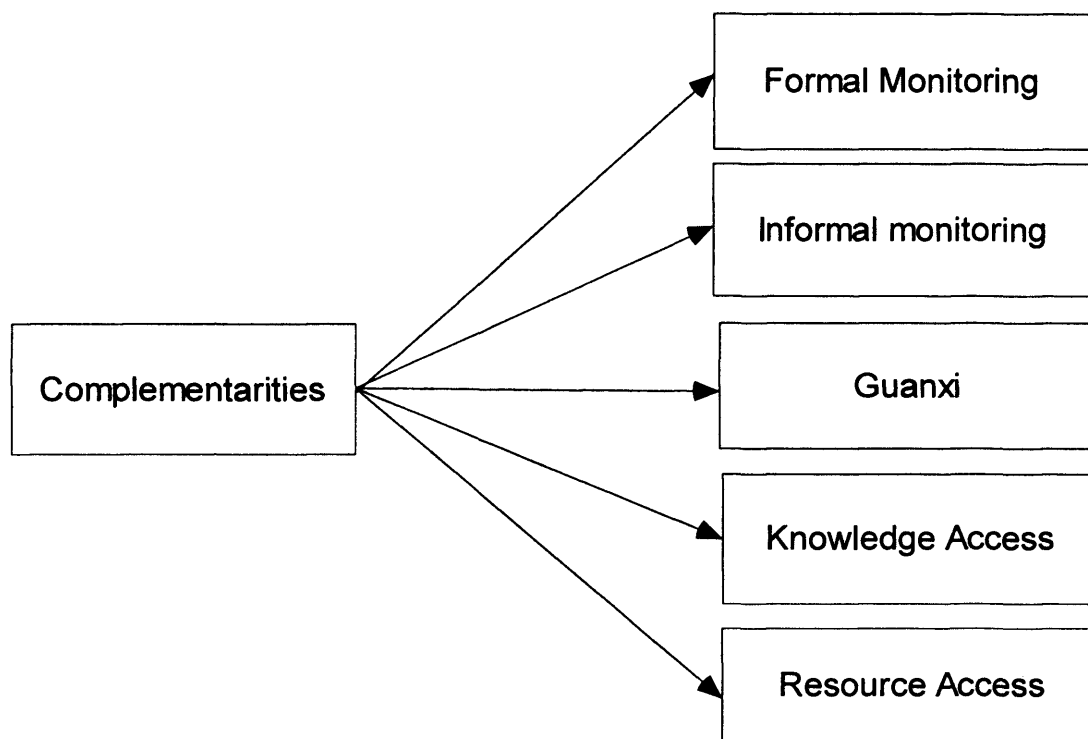


Figure 3-3 Model of the Value-added

3.4.1 Complementarities and Guanxi

While it has been recognized in earlier research that Guanxi can facilitate monitoring, and aid access to resources and knowledge (Ahlstrom et al., 2007), it is not fully understood what role Guanxi plays in an inter-organizational relationships and greater understanding is needed to explain the role of Guanxi.

In this study, we argue that expected economic benefits from collaboration are an important factor determining the willingness of technology-based firms to form a partnership with venture capital, and also the motivation for venture capital investors to enter in an inter-organizational relationship and devote time for start-up management.

Contributing to the literature on the influence of complementarities on partner formation, Doz (1988) observed that the complementarities between partnering

firms were typically clear prior to the negotiations on the terms of contract. It was the existence of complementarities that brought the potential alliance partners together in the first place. Similarly, Shan and Hamilton (1991) found support for the important role of complementarities in forming strategic alliances in the biotechnology industry. Nohria and Garcia-Pont (1991) reported that in the global automobile industry, firms in certain strategic groups formed alliances in a complementary manner with firms in other strategic groups in order to increase the benefits of cooperation. Supporting the importance of complementarities in partner formation, Gulati (1995b) found that firms occupying complementary resources had higher likelihood of forming alliances. Hitt et al. (2000) examined 202 companies in developed and emerging market countries and compared the factors affecting their alliance partner selection. They concluded that firms both in emerging and developed markets consider complementary resources as a valuable determinant in their partner selection and the form of partnership. The 'Terms of Alliance' is the settlement of differences in which each side makes concessions. We argued that once venture capital and technology-based firms realise they could create better value by combining their complementary resources and capabilities through the relationship, both parties will be willing to collaborate and maintain a close Guanxi.

The resource-based views regard complementarities in resources and capabilities as the primary reason for firms entering into inter-organizational relationships (Chung et al., 2000; Das and Teng, 2000; Hitt et al., 2000). Closely related to the context of the present study, Teece (1986) argued that firms in high-growth industries have to form alliances with other firms with complementary capabilities to ensure timely product introduction and to marshal a full array of the required capabilities. Furthermore, complementarities have been found to influence both the formation of inter-organizational relationships (Chung et al., 2000; Doz, 1988,

1996; Gulati, 1995b; Hitt et al., 2000; Niederkofler, 1991; Nohria and Garcia-Pont, 1991; Shan and Hamilton, 1991) and their performance (Harrigan, 1985; Johnson et al., 1996; Sarkar et al., 2001).

The resource-based views have also been used to explain the partners' incentives and willingness to invest in the relationship. Supporting the role of economic motivation for successful collaboration, Park and Ungson (1997) found in their event history analysis of 186 joint ventures that opportunistic threat and rivalry were positively related to the dissolution of joint ventures. Similarly, Larson (1992) conducted case analyses of seven alliances of entrepreneurial firms and found that economic incentives and mutually beneficial strategic rewards were a necessary condition for the effective development of an exchange relationship.

Summarising the arguments derived from the above-described literature, it can be concluded that they all lead to similar conclusions regarding the relationship between technology-based and venture capital firms and the incentives to form the partnership or to engage in close Guanxi. Synthesizing these arguments leads to the hypothesis that complementarities create incentives for collaboration and promote motivation for Guanxi both before and after signing a contract. Therefore, we argued that complementarities are positively related to Guanxi before and after signing a contract in China. Therefore, we hypothesize:

Hypothesis 5. (A) The greater the complementarities between the venture capital firm and the portfolio company, the closer the Guanxi between the two companies before signing a contract.

Hypothesis 5. (B) The greater the complementarities between the venture capital

firm and the portfolio company, the closer the Guanxi between the two companies after signing a contract.

3.4.2 Complementarities and Formal / Informal Monitoring

The previous section has argued that the expected economic benefits from collaboration are an important factor determining the willingness of portfolio companies to collaborate that includes making more concessions on deal negotiation and accept more rigorous monitoring requirement. Hsu (2004) evaluated the value of venture capital firm's reputation, and showed that reputable venture capital funds negotiate better deal terms, i.e. lower valuations. The author confirmed the proposition that entrepreneurs are willing to accept more rigorous terms in order to form a partnership with venture capital firm with better reputations. This implies that venture capital firms' complementary resources may be more distinctive than their financial capital and have significant impact on deal negotiation—formal monitoring. Therefore, we argued that complementarities are positively related to formal monitoring:

Hypothesis 6. The greater the complementarities between the venture capital investor and the portfolio company, the more formal monitoring requirement is applied by venture capital investor.

Similarly, we argued that the expectation of reciprocal benefits through combining complementary resources collaboratively from collaboration may enhance the portfolio companies' willingness to accept more informal monitoring requirement from venture capital investors. Thus:

Hypothesis 7. The greater the complementarities between the venture capital investor and the portfolio company, the more informal monitoring requirement is applied by venture capital investor.

3.4.3 Complementarities and Resource Access/Knowledge

Access

The combination of complementary resources is a significant potential source of inter-organizational competitive advantage (Dyer and Singh 1998). Previous literature has argued that complementary resources are one of the primary reasons for firms to enter inter-organizational relationships. Central to this argument is the idea that complementarities create the potential for value creation through combination of complementary resources. After forming a relationship with a partner possessing complementary resources, it is likely that some of the complementary resources will be combined (Larsson and Finkelstein 1999). Therefore, we argued that complementarities are positively related to resource access:

Hypothesis 8. The greater the complementarities between the venture capital investor and the portfolio company, the greater resources access for the portfolio company.

Another important factor that can determine the incentive for seeking venture capital investment is the complementarity of their knowledge bases. Learning crystallizes when the new knowledge encourages the entrepreneur to re-examine its assumptions, combine the new knowledge with existing ones, or modify its procedures and practices (Zahra et al., 2000). Greater opportunities to acquire, understand and assimilate new knowledge exist when entrepreneur complement rather than substitute their existing knowledge (Hoskisson and Busenitz, 2001). If

the venture capital firm has the complementary knowledge, entrepreneur definitely would like to access and exploit the complementarities. This can facilitate new product and process developments that improve profitability and growth (Block and MacMillan, 1993). Therefore, we argued that complementarities are positively related to knowledge access:

Hypothesis 9. The greater the complementarities between the venture capital investor and the portfolio company, the greater knowledge access for the portfolio company.

3.5 The Role of Guanxi as a Facilitator in Monitoring and Value-added

In this section, a model of Guanxi as a facilitator in monitoring and value-added mechanisms is developed. Adding to the previously described complementarities model, this model focuses on the idea that besides influence of the complementarities, Guanxi also influences the monitoring and value-added mechanisms. This model is illustrated in Figure 3-4 and described in the following sections. We use the Chinese concept of Guanxi to develop this model. However, some of hypotheses are primarily consistent with Western literature, particularly in venture capital and sociology. In general, previous research has found that most models of interpersonal relationships proposed by Western psychologists are also applicable to Chinese people (Bond and Hwang 1987, p. 241).

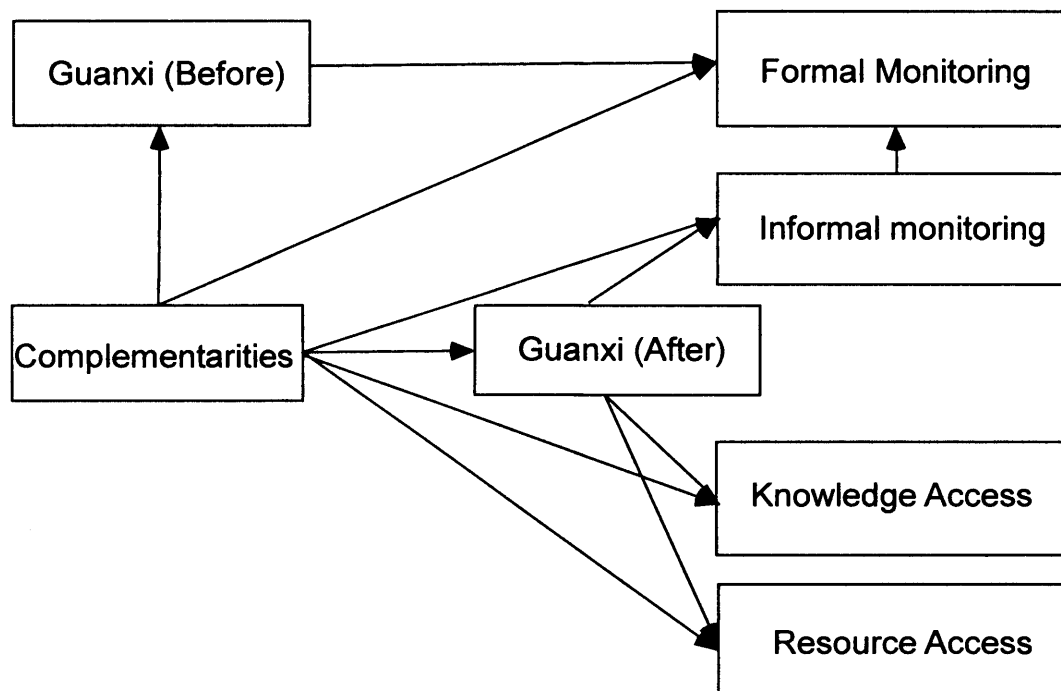
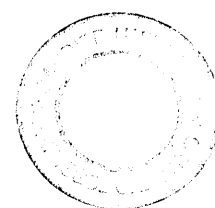


Figure 3-4 Model of Guanxi as a Facilitator

3.5.1 Guanxi and Formal Monitoring

Once a venture is selected for investment, negotiations about the components of the deal begin. Previous research found even in the rules-based mature market economies with strong property rights enforcement (Zacharakis, 2004; Peng, 2003), inter-organization and inter-personal relationships have a strong influence on contractual term negotiations. In her recent paper focused on venture capital relationship in UK, Smith (2005) showed that contract was a combination of mutual understanding and legal documentation. Venture capitalists in UK set out at least the minimum expected requirements on contract, even they believed it is important to have a very friendly relationship from the start which they considered to be ‘hands-on’ with a ‘level of trust’ .

In contrast, we argued that in the relationship-based transitional economies where the enforcement of property rights are weak (Zacharakis, 2004; Peng, 2003),



inter-organizational and inter-personal relationships have much more significant influence on contractual term negotiation. This is because an insistence on rigorous contractual covenants that directly protect investors' interests will send a signal of distrust and reduced commitment to the entrepreneurial team (Batjargal and Liu, 2004). To convince the entrepreneurial team to accept those contractual covenants depends on the willingness and understanding of entrepreneurial team. We argue that a better Guanxi between two parties will facilitate the understanding of usage of contractual covenants and improve the willingness of entrepreneur to accept them. Therefore, the better the Guanxi between the venture capital and technology-based firms, the more likely the management team is to accept the attached terms and conditions.

To summarize the above discussion, despite the institutional differences, previous research on Guanxi and venture capital deal negotiation all lead to a similar conclusion, namely those strong ties between entrepreneurs and venture capitalists before signing a contract influence the usage of contractual covenants. Therefore, we argued that Guanxi before signing a contract is positively related to formal monitoring:

Hypothesis 10. The closer the Guanxi between the venture capital investor and the portfolio company before signing a contract, the greater the level of contractual restrictions.

3.5.2 Guanxi and Informal Monitoring

As mentioned before, venture capitalists will not legalize all the monitoring measures in their formal contract as a compromise of their relationship with the investee (Smith, 2005; Peng; 2000; Tsui, 2004; Batjargal, 2004). As a result, venture capital firm needs to require much more detailed information than contract

requirement (Smith, 2005) as the complementary formal monitoring mechanism. Through informal monitoring activities, venture capital investors can help the investee stay on the right track, protect the interest of the venture capital firm, ameliorate the problems of information asymmetry and increase the likelihood of higher returns on investment (Sahlman, 1990). Informal monitoring is viewed as complementary to formal contracts in situations of asymmetric information and uncertainty.

In the West, informal monitoring typically involves extensive personal interaction with the funded firm. When monitoring a funded firm in China, venture capitalists must be even more diligent (Bruton, 2003) because of China's relatively weak institutional environment and problematic enforcement of judgments (Lubman, 2001; Peng et al., 2001; Young et al., 2001). As a consequence, the cultivation of long-term, reliable Guanxi and the adoption of a Guanxi-oriented management style builds the trust that is necessary to conduct business transactions and are essential for survival (Redding, 1990). Venture capitalists have to rely on Guanxi with the funded firm to aid in the monitoring process (Bruton et al., 2002). And better Guanxi facilitates the funded firm's understanding of informal monitoring and increases the willingness of the funded firm to accept these requirements.

Furthermore, venture capital investors also expected a "full and frank exchange of 'need to know' information" for efficient monitoring (Smith, 2005:769). The quality of information obtained through these monitoring mechanisms depends on the portfolio companies committed to this activity (Harris and Raviv, 1979), and the portfolio companies' committed to monitoring depend on how well the relationship is between two parties. If the venture capitalists are to properly monitor their investment, they must develop trust with the entrepreneur so that

they obtain the desired information and ensure its accuracy. Good Guanxi provided venture capitalists with better access to senior management and other important individuals and is likely to lead to fine-tuned, honest, precise, and timely information exchanges between the venture team and venture capital firm (Batjargal and Liu 2004). Good Guanxi is extremely important when a venture capitalist requires information from investees in transitional economies, such as China. A less market-oriented systems may also be associated with a lower willingness to disclose non-mandatory information (Wright et al 2004). In particular, in a Chinese culture setting, there are typically clear insiders and outsiders and the flow of information to outsiders is severely restricted (Goa et al., 1996). When venture capitalists have frequent contact and take time to interact with entrepreneurs in a business or social context, trust can be engendered because an entrepreneur can observe the venture capitalist's behaviour across a variety of situations. Thus, information obtained in interactions enables an entrepreneur to foresee the venture capitalist's future behaviour with confidence, which fosters trust and in turn increases the willingness of the entrepreneur to accept informal monitoring. Therefore, we argue that Guanxi is positively related to informal monitoring:

Hypothesis 11. The closer the Guanxi between the venture capital investor and the portfolio company after signing a contract, the more informal monitoring requirement applied. .

The motivation of informal monitoring is to help the investee stay on the right track and improve their performance. Informal monitoring is not a mandatory mechanism based on a formal contract. To conduct informal monitoring smoothly and efficiently depends on the willingness and understanding of the funded firm, which depends on the Guanxi between two parties. In short, deepening Guanxi

enables more efficient informal monitoring.

China is generally recognized as having different cognitive institutions than the United States and Western Europe (Orru et al., 1997; Peng, 2000). Chinese culture also emphasizes the importance of relationships in business (Boisot and Child, 1996; Bruton et al., 1999). As the venture capital industry is less regulated and established than the banking industry in China, this suggests that Guanxi could be even more important in the venture capital industry (Bruton et al., 2002). Therefore, we hypothesize that whilst complementarities are the key enabler to the willingness of the funded firm to collaborate informal monitoring activities and to feed more information to the venture capital investor, that effect is mediated by Guanxi.

Hypothesis 12. Guanxi mediates the positive relationship between complementarities and informal monitoring.

3.5.3 Formal and informal Monitoring

It has been argued that there exists a strong tie between formal and informal monitoring (Smith, 2005; Peng, 2000; Tsui, 2004; Batjargal, 2004). If a portfolio company has the willingness to accept more informal monitoring requirement after signing a contract, it is likely that the company has accepted more rigorous formal monitoring terms in a formal contract. Therefore:

Hypothesis 13. Informal monitoring is positively related to formal monitoring.

3.5.4 Guanxi and Resource Access

Although the complementarities between the venture and the investor create potential for value creation through a combination of complementary resources

and the fact that the potential is likely to be exploited in these relationships, there is still a lack of understanding as to what facilitates this potential. This study argues that Guanxi plays a key role in facilitating the potential benefits from complementarities between the two companies.

As Larsson and Finkelstein (1999) argued in their research on synergy realization in acquisitions, the existence of complementary resources is not enough for fully actualizing the potential benefits, and it takes interaction between the parties to achieve the potential benefits from complementarities. Guanxi therefore facilitates the exchange of information and other resources and assists in the identification of opportunities for cooperation (Cohen and Levinthal 1990, Dyer and Singh 1998, Lane and Lubatkin 1998, Nahapiet and Ghoshal 1998, Starr and MacMillan 1990, Zahra et al. 2000a).

Examining the entrepreneur-venture capitalist relationship from the 'Prisoner's Dilemma' (Poundstone, 1992) perspective in U.S., Cable and Shane (1997) argued that the probability of cooperative entrepreneur-venture capitalist relationships increases with the quality and frequency of their communications. We predict a similar effect in venture capital investor-portfolio firm relationships in China. Therefore:

Hypothesis 14. The closer the Guanxi between the venture capital investor and the portfolio company after signing a contract, the greater resource access for the portfolio company.

3.5.5 Guanxi and Knowledge Access

Previous research has argued that those venture capital firms which are likely to possess knowledge of markets, technology, and competition will be most useful to

their portfolio companies (Bygrave, 1987; Zider, 1998). However, the mere existence of complementary knowledge is not enough for the realization of the potential combination benefits.

The extent to which a technology-based firm can access external knowledge from its venture capital investors will depend on the existence of external knowledge, on the ability of the firm to recognize and assess the value of the knowledge, on close relationship (Guanxi in Chinese case), and on the willingness of the dyad firms to share information (Cohen and Levinthal, 1990; Dyer and Singh, 1998; Lane and Lubatkin, 1998). Nahapiet and Ghoshal (1998) argued that social capital facilitates knowledge access by affecting conditions necessary for the exchange and combination of existing intellectual resources, whilst Lane and Lubatkin (1998) have pointed out that dyadic learning relationships involve a pattern of interactions that affects the learning of both members of the dyad.

Chinese culture also makes Guanxi play an even more important role in offering knowledge to portfolio companies. In the US, advice provided to CEOs of funded firms can be very direct and may occur in regular interactions (Fried and Hisrich, 1995). However, in China the venture capitalist must deal appropriately with the rather formidable cognitive institution known as *mianzi*—face or respect. Its relative greater importance in a Chinese culture is widely recognized (Bond, 1988), and venture capitalists must advise managers whilst allowing them to maintain face. Rather than giving an ultimatum, for example, ideas are best put forth as suggestions or even posed as questions and are not made in front of a manager's subordinates (Bruton 2003). It is has been argued good Guanxi facilitates understanding and trust of each party, and those venture capitalists who have a good Guanxi with their investees can advise them more directly and frankly.

To summarize the above discussion, despite the institutional difference, previous research on Guanxi and venture capital knowledge transfer all leads to similar conclusion that strong ties between entrepreneurs and venture capitalists facilitate knowledge sharing. Therefore, following Dyer and Singh (1998), Lane and Lubatkin (1998), Zahra et al. (2000a), we argued that Guanxi facilitates the exchange of information and assists in the identification of opportunities for cooperation. Therefore:

Hypothesis 15. The closer the Guanxi between the venture capital investor and the portfolio company after signing a contract, the greater knowledge access for the portfolio company.

Complementarities are a key activator for resource sharing, but Guanxi helps in understanding the values and beliefs of each party better, facilitates interpersonal and cognitive trust, and identifying opportunities for cooperation. Without Guanxi, the investee may not be able to access investor's resource or may only access a limited extend. Cultural features of the Chinese, such as a strong sense of role obligation, favouritism, and inclinations to categorize people into in-group and out-group circles (Farh et al. 1998) may also facilitate better communication and resource sharing between investors and entrepreneurs who know each other better. Thus, we argue that, good Guanxi gives investee preferential access to an investor's resource and Guanxi mediates the influence of complementarities on resource access:

Hypothesis 16. Guanxi mediates the positive relationship between complementarities and resource access.

The existence of complementary knowledge creates a learning opportunity but it

does not yet make the learning happen. According to received theories and empirical research, network/Guanxi is essential for organizational learning (Peng and Luo, 2000; Bresman et al., 1999; Cohen and Levinthal, 1990; Nahapiet and Ghoshal, 1998; Yli-Renko et al., 2001a). While complementarities are likely to create potential for valuable learning opportunities, these opportunities would remain largely unachieved without Guanxi facilitating the knowledge transfer. Therefore, this study suggests that Guanxi will mediate the effect of initial conditions on knowledge access in the venture capital investor-portfolio firm dyad:

Hypothesis 17. Guanxi mediates the positive relationship between complementarities and knowledge access.

3.6 Relationship between Value Added and Perceived Information

In this section, a model of the relationship between value-added and the accuracy and adequacy of perceived information is developed. Adding to the previously monitoring model, this model focuses on the idea that besides influence of the formal and informal monitoring mechanisms value-added also influence the result of monitoring—the accuracy and adequacy of perceived information. This model is illustrated in Figure 3-5 and described in the following sections.

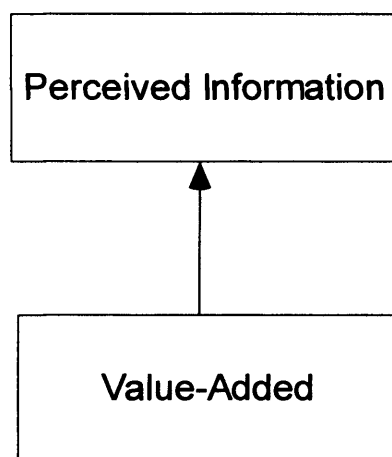


Figure 3-5 Model on relationship between Value-added and perceived information

Some scholars, i.e. Schindele (2002), have argued that there are strong ties between monitoring and value added and the financier's incentives for advice are in line with entrepreneurial incentives for monitoring. Since the ultimate goal of monitoring is to mitigate the information asymmetry, we argued that the portfolio companies are willing to disclose more detailed and accurate information to venture capital investors when they receive value added from venture capital investors through the investment relationship. Our argument is also in line with Chinese cultural norm—*renqing* (reciprocal favour). The rules of reciprocal favour require the member of network who has received favour or help from others, he/she should return it as soon as the opportunity arises (Hwang 1987). Reciprocal favour is morally binding for Chinese people, and those who do not repay favours are considered to have “no credibility” and they lose face, reputation, and ultimately personal relationships and their peers' trust. The norm of reciprocal favour requires that all members of a group perform favours to help those in need and that all favours be repaid. Therefore, we hypothesized value added is positively related to perceived information:

Hypothesis 18. The greater the valued added received by the portfolio companies, the more accurate and adequate of perceived information received by venture capital firms

3.7 Summary

In order to examine the factors influencing monitoring effect and driving the value-added benefits, a model of the monitoring and value added mechanisms and the factors influencing these mechanisms was developed based on previous research. There are five sub models in the model, namely (1) monitoring mechanisms, (2) value-added mechanisms, (3) the role of complementarities in monitoring and value-added mechanisms (4) the role of Guanxi as a facilitator in informal monitoring and value-added (5) the relationship between value-added and perceived information. The summary of the hypotheses is presented in Table 3.1:

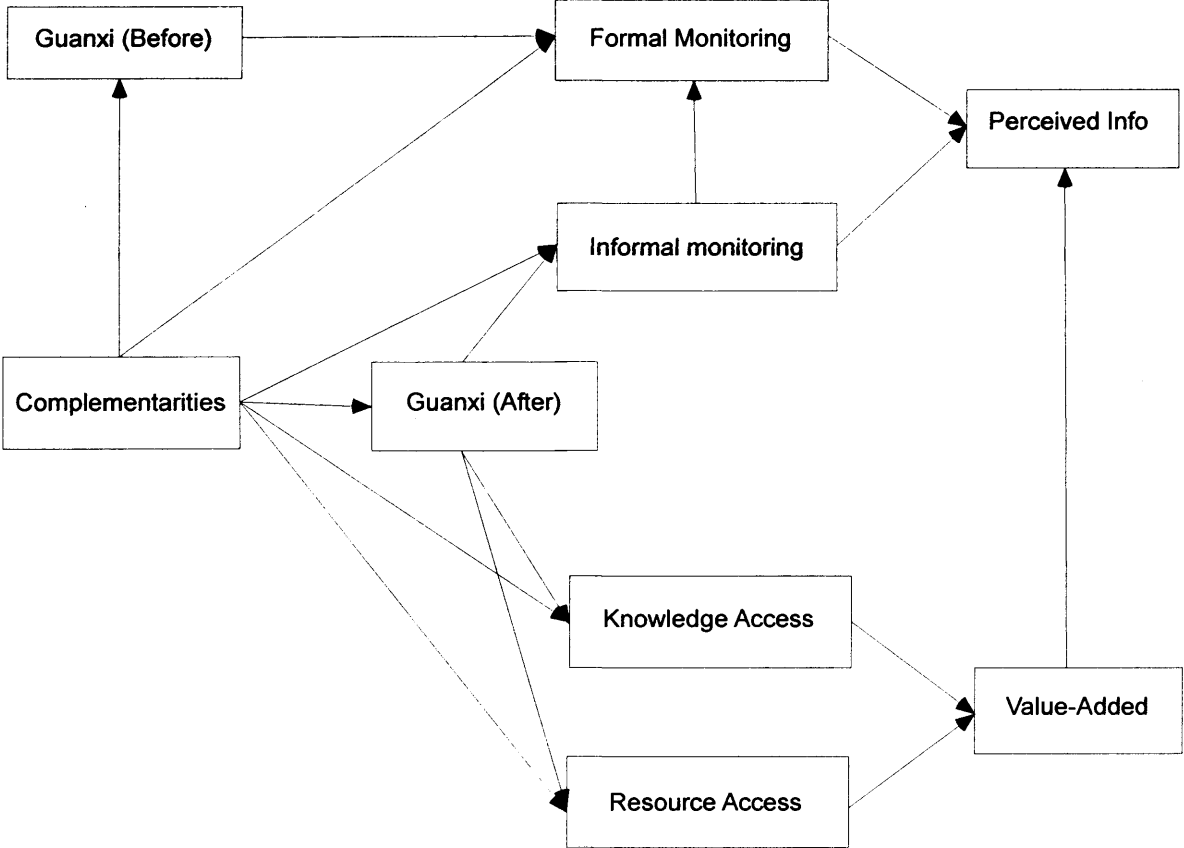
Table 3.1 Summary of the Hypotheses

Hypothesis	
<i>Model on Monitoring mechanisms</i>	
H1	Formal monitoring is positively related to perceived information
H2	Informal monitoring is positively related to perceived information
<i>Model on Value-added mechanisms</i>	
H3	Resource access is positively related to value-added
H4	Knowledge access is positively related to value-added
<i>Model on the role of complementarities in Monitoring and Value-add</i>	
H5A	Complementarities are positively related to Guanxi before signing contract
H5B	Complementarities are positively related to Guanxi after signing contract
H6	Complementarities are positively related to formal monitoring
H7	Complementarities are positively related to informal monitoring
H8	Complementarities are positively related to resource access
H9	Complementarities are positively related to knowledge access
<i>Model on the Role of Guanxi as a Facilitator in informal monitoring and Value-added</i>	
H10	Guanxi is positively related to formal monitoring
H11	Guanxi is positively related to informal monitoring
H12	Guanxi mediates the positive relationship between complementarities and informal monitoring
H13	Informal monitoring is positively related to formal monitoring
H14	Guanxi is positively related to resource access

H15	Guanxi is positively related to knowledge access
H16	Guanxi mediates the positive relationship between complementarities and resource access
H17	Guanxi mediates the positive relationship between complementarities and knowledge access
<i>Model on Relationship between value-added and perceived information mechanism</i>	
H18	Value added is positively related to perceived information

The five sub-models together comprise an integrated model the monitoring and value-added mechanisms and the factors influencing those mechanisms in relationship between venture capital investor and their portfolio companies. Figure 3-6 illustrates the integrated hypothesized model.

Figure 3-6 Integrated model



CHAPTER 4 RESEARCH METHODOLOGY

4.1 Introduction:

This chapter discusses the methodology used in the present study. First, the sources of primary data and the survey are discussed. Then, the statistical methodology used in the present study is discussed. Thereafter, the operationalization of constructs is discussed. Finally, the chapter discusses the various elements or reliability, validity, and generalizability and how those elements have taken into account in the present study.

4.2 Population and Sample

The sample venture capital firms were identified from the latest China Venture Capital Directory maintained by Zero2IPO Venture Capital Research Centre, a commercial consultant company based in Beijing, China. This extensive source has been used in earlier research on China's venture capital (Zeng, 2004) and is widely recognized as the leading source of China's venture capital investment data. The directory currently contains information on 263 venture capital firms which actively invest in mainland China. A questionnaire was sent to the fund managers of all these venture capital firms in July 2006.

4.3 Survey

The primary source of data in this research is a mail survey administered to the fund managers of the whole population of the identified venture capital firms. Additional interviews were conducted in Guangzhou and Beijing, China. The survey is described in the following sections.

4.3.1 Questionnaire

The survey instrument used in the present study was a two page questionnaire

with sections covering background information, screening and diligence, valuation, monitoring and value-added provided by the venture capital investor, relationship with these investors, and more specific questions on the relationship with the venture capital investor. In order to identify and eliminate potential problems (Hunt et al., 1982), the questionnaire was pre-tested with several fund managers and researchers. The relevance and clarity of the questions were also checked with several venture capital investors and researchers familiar with the topic area. Answering was encouraged by promising a summary of the results in return. Appendix B shows the final version of the questionnaire.

An important factor in questionnaire design was that data gathered are compatible with statistical software package SAS and SPSS for data processing and analysis. This aspect was kept in mind throughout the questionnaire design process.

4.3.2 Mailing Process and Response Pattern

A pervasive problem in studying the venture capital industry is the lack of data (Lerner, 2001). To boost the response rate, there were altogether three mailings administered to the fund manager of the sample firms in the survey of the present study. First, a mailing consisting of a cover letter, a letter from researcher's supervisor (Professor Dylan Jones-Evans) as shown in appendix A, and the two-page questionnaire were sent to 263 venture capital firms in three batches. A week later, reminder emails were sent. Four weeks later, the third and final fax was sent to non-respondents as a reminder.

The total number of firms to which the questionnaires was sent was 263. Of these firms, 27 could not be located or the named recipient was not employed by the company anymore. Therefore, the effective maximum sample was 236

companies. Of these 236 firms, 59 returned the filled questionnaire. This translates to a response rate of 25.0 %. This response rate can be considered acceptable, given that it was requested that the two-page questionnaires were completed by the fund managers. Management time is a critically scarce resource for this group and therefore Gaedeke and Tootelian (1976) forecasted a 20 percent response rate from surveys of top executives.

Most of returned questionnaire were from Beijing, Shanghai and Guangzhou. Illustrating these sample venture firms, the average age of the venture capital firms is 7.78 years, with an average of \$157.6 million dollars funds available for investing in mainland China. The fund managers of these VC firms were likely to be under strong investor pressure to focus on their business rapidly (and not to spend their busy time answering any surveys). Most of the venture capital firms in China is not just focused on technology-based investment but also places much attention on the traditional sector, e.g. dairy products. These investment environments may have had an adverse effect on the willingness of fund managers to participate in this survey research.

Of the 59 returned questionnaires, one company was excluded from the analysis because the respondent had not provided sufficient information on the corporate investor. The final number of ventures included in the analyses is 58.

As the survey was answered by a single key informant, it is important that the respondent is knowledgeable as to the operations of the venture capital firm (John and Reve 1982). The survey was sent primarily to the fund managers of the venture capital firms. In the absence of the contact information of the fund managers, the survey was sent to the managing director. The great majority of the respondents were fund manager of the sample companies.

4.3.3 Missing Value Analysis

There were very few missing values in the data (2.29% of all used measurement items). We analyzed the missing values and did not find any significant patterns of missing values. The influence of missing data appeared to be insignificant. Mean substitution was used to replace the missing values. We tested the effect of this and noted that this choice did not influence the results in this study.

4.3.4 Analysis of Common Method Variance

As there are no close proxies or external measures available for many of the critical variables examined in the present study (such as informal monitoring from a venture capital investor relationship) we had to rely on the self-reported assessment of fund managers of the sample venture capital firms on these variables. Because of this approach, it is important to ensure that common method variance is not causing the relationships between variables (Avolio et al., 1991; Podsakoff and Organ, 1986). In order to ensure that common method variance does not undermine the results, we used earlier validated measures as much as possible (Spector 1987). We also examined the possibility of common method variance using Harman's single factor test as suggested by Podsakoff and Organ (1986). Inclusion of all the items used in the multi-item scales yielded 9 factors with an eigenvalue of over 1.00. The first factor explained 46% of the variance (see Chapter 4.6.1). Based on this analysis, it appears that common method variance is not a serious threat to the validity of this study.

4.4 Statistical Methods

In order to test the hypotheses developed in the study, the present study employed four main statistical methods. First, confirmatory factor analysis was employed in testing the validity of the constructs. Second, multiple regression analysis was used in testing the paths between constructs. Third, an application of

the multiple regression analysis was used to test the mediation effects. Fourth, structural equation modelling was employed to test simultaneously the paths in the integrated model. These methods, their assumptions, and the interpretation of the results are explained in the following sections.

4.4.1 Confirmatory factor analysis

In the present study, factor analysis was used to confirm that the observed measurement items define latent theoretical constructs as expected, on the basis of theoretical grounds. This method, known as confirmatory factor analysis (CFA) is used to test that the number of factors and the loadings of measurement items on them conform to what is expected on the basis of pre-established theory. Measurement items are selected on the basis of prior theory and factor analysis is used to see whether they load as predicted on the expected number of factors. Confirmatory factor analysis thereby complements the use of Cronbach's alpha coefficients in evaluating the reliability and validity of constructs.

Based on an extensive literature review, Guadagnoli and Velicer (1998) concluded that the solutions generated from principal component analysis differ little from those derived from factor analytic techniques. In reality, there are some circumstances for which this statement is untrue. Stevens (1992) summarizes the evidence and concludes that with 30 or more variables and communalities greater than .7 for all variables, different solutions are unlikely; however, with fewer than 20 variables and any low communalities (<.4) differences can occur.

Confirmatory factor analysis assumes that a number of a priori defined factors explain the majority of the covariation among the observed variables. The variance of each observed variable consists of the proportion of variance determined by a linear combination of the common factors and the proportion determined by a

specific component unique to the variable. The coefficients, which define the linear combination of factors for each variable, are called factor loadings. A factor loading can be interpreted as a standardized partial correlation coefficient between the variable and the factor while controlling for the other factors (Schumacker and Lomax, 1996).

Eigenvalues represent the amount of variance accounted for by a factor. They are commonly used as the basis of extracting factors in factor analysis. The common guideline is that any factor with an eigenvalue of less than 1.00 should not be used because such factors explain less variance than a single variable (Hair et al., 1998). In the present study, this eigenvalue criterion was used to confirm that the number of factors that emerge from the data corresponds to the number of factors determined a priori on the basis of theoretical grounds.

Besides confirming the correct number of factors, the factor analysis was used to confirm that the measurement items loaded on correct factors. In confirmatory factor analysis, a common rule of thumb is that only items with factor loadings of .60 or higher on the primary factor and loadings of .40 or lower on any other factor are retained. These guidelines were employed in the present study.

There are two primary alternative methods available for extracting factors: principal component analysis (PCA) and principal factor analysis (PFA). In PCA, factors are based on the total variance (common, specific, and error variance) whereas in PFA factors are based on a reduced correlation matrix excluding the specific and error variance (Hair et al. 1998). PFA uses a PCA strategy but applies it to a correlation matrix in which the diagonal elements are not 1's, as in PCA, but iteratively-derived estimates of the communalities. PCA by far is the most common form of factor analysis. PCA was also used in the present study for

extracting factors.

Factor rotation is an important part of factor analysis and is needed to make the factor solution interpretable. There are various alternative methods for factor rotation of which Varimax rotation is most often used. Being an orthogonal rotation algorithm, Varimax rotation creates a factor solution consisting of factors that are uncorrelated with each other. Varimax rotation aims at finding a factor solution where a variable loads highly on one particular factor and loads as low as possible on the other factors. In the present study, Varimax rotation algorithm was used whenever a factor solution consisted of more than one factor.

4.4.2 Multiple linear regression analysis

Multiple regression is used to account for (predict) the variance in an interval dependent, based on linear combinations of interval, dichotomous, or dummy independent variables. Multiple regression can establish that a set of independent variables explains a proportion of the variance in a dependent variable at a significant level (through a significance test of R^2), and can establish the relative predictive importance of the independent variables (by comparing beta weights). Power terms can be added as independent variables to explore curvilinear effects. Cross-product terms can be added as independent variables to explore interaction effects. One can test the significance of difference of two R^2 's to determine if adding an independent variable to the model helps significantly. Using hierarchical regression, one can see how most variance in the dependent can be explained by one or a set of new independent variables, over and above that explained by an earlier set. Of course, the estimates (b coefficients and constant) can be used to construct a prediction equation and generate predicted scores on a variable for further analysis.

In the present study, multiple regression analysis was used as the main statistical method to test the hypotheses. The general form of the multiple linear regression equation is $y_j = b_0 + b_1x_{1j} + b_2x_{2j} + \dots + b_nx_{nj} + e_j$, where y_j represents the values of the dependent variable that is explained in the regression, $x_{1j} - x_{nj}$ are the observations of the independent variables, b_0 is the constant, $b_1 - b_n$ are the regression coefficients for $x_{1j} - x_{nj}$, and e_j is the error term representing observed residuals from fitting the regression line to the set of observations.

Of the various regression analysis methods, ordinary least squares regression (OLS) is the most common regression analysis method. In the ordinary least squares regression, the sum of squared residual vertical distances between the data points and associated points in the regression line are minimized. The present study employs OLS regression.

Assumptions in Multiple Regression Analysis

Multiple linear regression is based on several assumptions concerning the quality of the data and the nature of the phenomenon analyzed. The most important assumptions are (1) metric data; (2) linearity of the phenomenon; (3) constant variance of the error term; (4) independence of the error terms; (5) normality of the error term distribution; (6) low multicollinearity and (7) sufficient sample size. These assumptions and their implications for the present study are discussed below.

Metric data. The data has to be metric or transformed appropriately (Hair et al., 1998). In this study, the statistical properties of the variables are examined in order to identify any violations. In this study, the categorical variables such as industry sector are included as dummy variables (Hair et al. 1998).

Linear relationships. The relationships between the dependent and independent variables should be linear. The linearity of the relationship between dependent and independent variables represents the degree to which the change in the dependent variable (the regression coefficient) is constant across the range of value for the independent variable. Linearity can be detected using residual plots. Any curvilinear pattern indicates a non-linearity. Non-linearity of a relationship can be overcome using data transformation techniques (Hair et al. 1998). In the present study, data transformations are used when the analyses indicate nonlinear relationships.

Dependent variable normally distributed. The dependent variable should be normally distributed. The normality of the variables can be tested using normal probability plots in which standardized residuals are compared with the normal distribution. Some normality issues can be dealt with by transformations such as logarithmic transformation in the case of lognormal distribution (Hair et al. 1998). In this study, the normality of the dependent variable and non-dummy independent variables were examined using the Normal P-P plot. In the Normal P-P plot, the cumulative proportion for a single numeric variable is plotted against the cumulative proportion expected if the sample were from a normal distribution. If the sample is from a normal distribution, points will cluster around a straight line. In the present study, the variables are transformed to achieve normality when necessary.

Constant variance of the error term. The variance of the error term should be constant. The presence of unequal variance in the error term (heteroscedasticity) violates the assumptions of OLS regression. Heteroscedasticity can be detected for instance by using the Levene test for homogeneity of variance, which measures the

equality variances for a single pair of variables. In case heteroscedasticity is present, it can be dealt with appropriate transformations, or if the violation can be attributed to a single independent variable, the procedure of weighted least squares can be employed (Hair et al. 1998). An effective method for dealing with heteroscedasticity is to use the White (1980) correction for heteroscedasticity. In this study, the presence heteroscedasticity was tested and transformations were employed in order to homogenize the variance when needed.

Independent error terms. The error terms should be independent. The predicted values should not be sequenced by any variable. Possible violations of this assumption can be detected by plotting the residuals against any possible sequencing variable. If the residuals are independent, the pattern should appear random. Violations occur when basic model conditions change but are not included in the model. Data transformations such as first differences in a time series model, or specially formulated indicator variables can be used to deal with this violation. In the present study, several control variables were used in order to take the potential differences in the basic conditions into account.

Low multicollinearity. The independent variables that are included in a model should not be multicollinear. Multicollinearity means that independent variables are highly correlated and makes it difficult to determine the contribution of each independent variable because the impact is mixed. High correlations among the independent variables, 0.90 and above, indicate substantial multicollinearity (Hair et al. 1998:191). However, lack of high correlation values does not ensure a lack of collinearity. Thus, better indicators of multicollinearity are the tolerance value and variance inflation factor (VIF), which tell the degree to which each independent variable is explained by other independent variables. Tolerance is the amount of variability of the selected independent variable not explained by the

other independent variables. Thus, very small tolerance values (and high VIF values) denote high collinearity. A common cut-off threshold is a tolerance value of .10, which corresponds to VIF values above 10 (Hair et al. 1998). In case multicollinearity is detected, it can be dealt with by (1) omitting one or more highly correlated predictor variables and identifying other, better predictor variables; (2) using the model only for prediction and making no attempt to interpret the regression coefficients; (3) using simple correlations between each predictor and dependent variable to understand the predictor-dependent variable relationship; and/or (4) use a more sophisticated method of analysis such as Bayesian regression or regression on principal components to obtain a model that clearly reflects the simple effects of the predictors (Hair et al. 1998). In this study, the existence of potential multicollinearity is examined on the basis of correlation matrices and variance inflation factors.

Sufficient sample size. Sample size has a strong impact on the explanatory power of multiple regression analysis. Hair et al. (1998) have suggested a minimum of 5 times as many observations as there are independent variables in the model to avoid an over fitting of the model and enabling generalizability. However, too large samples may cause the regression analysis to become overly sensitive (Hair et al. 1998). In the present study, the sample size is in line with the above recommendations. Darlington (1997) suggested 50 or more sample for clear and simple factor structure and 100 or more sample would be much preferable for a less clear structure.

Interpretation of the Results in Multiple Regressions

The statistical significance of each regression coefficient b_j is tested with a t -test. The t value indicates how many standard error measures the coefficient is from

zero, and the probability value p indicates the significance of the test that b_j is different from zero. A common threshold value for the regression coefficients to be considered as significant is .05. Unstandardized regression coefficients have a clear interpretation and can be used to build forecasting models. Standardized regression coefficients are needed when comparing the explanatory power of several regression coefficients in the same equation. In the present study standardized coefficients are reported to allow comparison between independent variables.

When comparing regression models, the most common standard used is overall predictive fit measured as the coefficient of determination (R^2). However, the drawback of this measure is that when adding new explanatory variables, the measure can never decrease. Thus, inclusion of all independent variables would give the maximum R^2 , even if the same level had achieved using fewer variables. In order to take into account the number of explanatory variables, the adjusted R^2 can be used. Adjusted R^2 is also useful in comparing models between different data sets because it compensates for the different sample sizes. In the present study, both adjusted and unadjusted R^2 are reported.

The statistical significance of the overall model is indicated by the F-test of the analysis of variance. The overall model can be considered significant when the significance level of the F-statistic is below .05. In the present study, F-statistics are also reported in the analyses.

4.4.3 Testing Mediating Effects

Once a relationship between two variables is established, it is common for researchers to consider the role of other variables in this relationship (Lazarsfeld, 1955). In addition to testing relationships with a single dependent variable and a

number of independent variables, the multiple regression method can be extended to the analysis of paths of relationships (e.g. Aguinis and Pierce 1999, Baron and Kenny 1986, Cohen and Cohen 1975). In this study, multiple regression analysis is used to test mediation effects. A variable may be considered a mediator to the extent to which it carries the influence of a given independent variable to a given dependent variable (Baron and Kenny 1986). Illustration of mediation is presented in Figure 4-1 below.

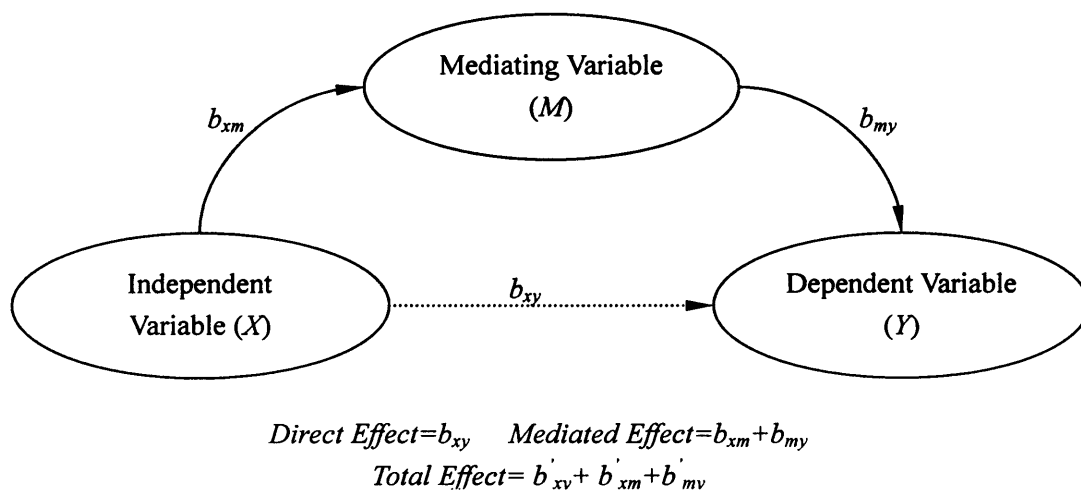


Figure 4-1 Illustration of Mediation Effect

If the effect of X on Y is zero when the mediator is included ($b'_{xy} = 0$), there is evidence for mediation (Judd and Kenny, 1981a, 1981b). This would be a full mediation.

If the effect of X on Y is reduced when the mediator is included ($b'_{xy} < b_{xy}$), then the direct effect is said to be partially mediated.

Steps in Establishing Mediation

Baron and Kenny (1986), the social psychological researchers presented four steps in establishing mediation. This study follows these steps in testing mediation hypotheses. Maula (2001) also used this methodology to test value-added

mechanism in a corporate venture capital investment scenario.

Baron and Kenny (1986) have presented four steps in establishing mediation. This study follows these steps in testing mediation hypotheses. The steps are presented below for variable M mediating the relationship between independent variable X and dependent variable Y as illustrated in Figure 4-1.

Step 1. Show that the independent variable is correlated with the outcome variable ($b_{XY} > 0$). Use Y as the criterion variable in a regression equation and X as a predictor. This step demonstrates that there is an effect that can be mediated.

Step 2. Show that the independent variable is correlated with the mediator ($b_{XM} > 0$). Use M as the criterion variable in the regression equation and X as a predictor. This step essentially involves treating the mediator as if it were an outcome variable.

Step 3. Show that the mediator affects the outcome variable ($b_{MY} > 0$). Use Y as the criterion variable in a regression equation and X and M as predictors (estimate both b_{MY} and b_{XY} in same the model). It is not sufficient just to correlate the mediator with the outcome; the mediator and the outcome may be correlated because they are both caused by the independent variable X. Thus, the independent variable must be controlled in establishing the effect of the mediator on the outcome.

Step 4. To establish that M completely mediates the X→Y relationship, the effect of X on Y controlling for M should be zero ($b_{XY} = 0$). The effects in both Steps 3 and 4 are estimated in the same regression equation.

If all four of these steps are met, then the data are consistent with the hypothesis that variable M completely mediates the X→Y relationship. However, if the first three steps are met but Step 4 is not, then partial mediation is indicated. Moreover, Step 1 is not necessarily required for establishing mediation, because a path from the independent variable to the outcome variable is implied if Steps 2 and 3 are met. If b_{XY} ' is opposite in sign to $b_{XM} * b_{MY}$, then it could be the case that Step 1 is not met, but there is still mediation. In this case, the mediator acts like a suppressor variable. Therefore, the essential steps in establishing mediation are Steps 2 and 3.

The amount of mediation is defined as the reduction of the effect of the initial independent variable on the dependent variable between the unmediated and mediated model. This difference in coefficients can be shown to equal exactly the product of the effect of X on M times the effect of M on Y ($b_{XM} * b_{MY} = b_{XY} - b_{XY}'$). The exact equality holds for multiple regression and structural equation modeling without latent variables, but it holds only approximately for structural equation model with latent variables. The amount of reduction in the effect of X on Y is not equivalent to either the change in variance explained or the change in an inferential statistic such as F or a p value. It is possible for the F from the independent variable to the outcome to decrease dramatically even when the mediator has no effect on the outcome.

Test of Mediation

If Step 2 (the test of $b_{XM} > 0$) and Step 3 (the test $b_{MY} > 0$) are met, it follows that there necessarily is a reduction in the effect of X on Y in the mediated model. An indirect and approximate test that $b_{XM} * b_{MY} = 0$ is to test that both b_{XM} and b_{MY} are zero (Steps 2 and 3).

Baron and Kenny (1986) provided a direct test of $b_{XM} * b_{MY}$ which is a modification of a test originally proposed by Sobel (1982). It requires the standard error of b_{XM} or s_{XM} (which equals b_{XM}/t_{XM} where t_{XM} is the t-test of coefficient b_{XM}) and the standard error of b_{MY} or s_{MY} . Following Goodman (1960), the standard error of $b_{XM} * b_{MY}$ can be shown to equal

$$\text{Goodman(I) Test : Standard error} = \sqrt{b_{MY}^2 * s_{XM}^2 + b_{XM}^2 * s_{MY}^2 + s_{XM}^2 * s_{MY}^2}$$

The test of the indirect effect is given by dividing $b_{XM} * b_{MY}$ by the above standard error and treating the ratio as a Z test (i.e., larger than 1.96 in absolute value is significant at the .05 level).

However, different versions of the above standard error have been published (Baron and Kenny 1986, Goodman 1960, MacKinnon et al. 1995, Sobel 1982). The above formula (Goodman I) is a population formula (Baron and Kenny 1986, Goodman 1960). In the Goodman II version of the test the third term is subtracted for an unbiased estimate of the variance of the mediated effect, which can sometimes have the unfortunate effect of yielding a negative variance estimate. Sobel (1982) presented an approximation of the above formula without the last term. The formulas only differ in the last term and its size is usually trivial in that it depends on sample size squared whereas the other terms depend only on sample size. Baron and Kenny (1986) recommended using the Goodman I version of the Sobel test because it does not make an unnecessary assumption that the product of s_{XM} and s_{MY} would be negligible small. MacKinnon et al. (1995) analyzed these tests using simulation and concluded that the Sobel test and the Goodman I test performed best in their analysis and converged closely with sample sizes greater than 50. In this dissertation, the first version (Goodman I) of the mediation test is used (Baron and Kenny 1986, Goodman 1960). The formula is

$$Goodman(I)Test : Z_Value = \frac{b_{xm}^2 * b_{my}^2}{\sqrt{b_{my}^2 * \frac{b_{xm}^2}{t_{xm}^2} + b_{xm}^2 * \frac{b_{my}^2}{t_{my}^2} + \frac{b_{xm}^2}{t_{xm}^2} * \frac{b_{my}^2}{t_{my}^2}}}$$

4.4.4 Structural Equation Modelling

Structural equation modelling is a multivariate method that can be used to examine a set of regression equations simultaneously (Bollen 1989, Hair et al. 1998:584). Structural equation modelling may be used as a more powerful alternative for instance to multiple regression, path analysis, factor analysis, time series analysis, and analysis of covariance. These procedures can be viewed as special cases of structural equation modelling which is an extension of the general linear model.

Structural equation modelling has some advantages compared to multiple regression including for instance more flexible assumptions, use of confirmatory factor analysis to reduce measurement error by having multiple indicators per latent variable, overall testing of the model fit rather than coefficients individually, the ability to test models with multiple dependent variables, the ability to model mediating variables, the ability to model error terms.

Structural equation modelling is normally viewed as a confirmatory rather than exploratory procedure (Byrne 2001:3). It uses goodness-of-fit tests to determine if the pattern of variances and covariances in the data is consistent with the hypothesized structural model specified a priori. It can also be used to test two or more causal models to determine which has the best fit (Loehlin 1987). As structural equation modelling cannot itself draw causal arrows in models or resolve causal ambiguities, theoretical insight and judgment by the researcher is critically important.

Interpretation of the Results in Structural Equation Modeling

The fit of a structural equation model is a multidimensional concept and should therefore be examined from a variety of perspectives. The examination of model fit includes the assessment of the parameter estimates and the model as a whole. The procedures used to examine the model fit in the present study are discussed below in more detail.

Parameter estimates. Byrne (2001:75) summarizes three areas of assessment on parameter estimates: (1) the feasibility of the parameter estimates, (2) the appropriateness of standard errors, and (3) the statistical significance of the parameter estimates.

The first step when assessing the model fit on the parameter estimate level is the examination of the feasibility of the parameter estimates. Parameters should have the correct sign and size according to the underlying theory. Clear examples of unreasonable estimates include correlations >1.00 , negative variances, and covariance or correlation matrices that are not positively definite (Byrne 2001).

The second step in the determination of the model fit on the parameter estimate level is the assessment of the appropriateness of the standard errors. Standard errors that are either excessively large or small are indicative of poor model fit (Byrne 2001). However, this assessment is subjective because the magnitude of standard errors is dependent on the unit of measurement and the parameter estimates.

The third step in the assessment of the model fit on the parameter estimate level

is the examination of the statistical significance of the parameter estimates. Non-significant parameter estimates, with the exception of error variances, can be considered unimportant for the model. However, it should be noted that sample size influences the significance of the parameters (Byrne 2001).

These three steps were followed in the analyses carried out in the present study.

The model as a whole. When examining the fit of the model as a whole, multiple indices are typically used to determine the model fit. Table 4.1 describes the goodness-of-fit measures used in this study.

Table 4.1 Goodness-of-fit criteria in structural equation modeling used in this study

<i>Criterion</i>	<i>Description</i>	<i>Interpretation</i>
Chi-Square	Calculation of difference between observe and estimated covariance matrices	$p > .05$ for model to be acceptable; sensitivity to sample size
Normed Chi-Square	Chi-square adjusted for degree of freedom	Recommendation between 1.0 and 2.0
Goodness of fit index(GFI)	Predicted squared residuals compared with obtained residual, not adjusted by degrees of freedom	Range between 0 (not fit) to 1.0 (perfect fit); recommendation above .90
Non-Normed fit index (NNFI)(=Tucker and Lewis's index/TLI)	Proposed model compared with the null model, adjusted by degrees of freedom	Range between 0 (not fit) to 1.0 (perfect fit); recommendation above .90
Comparative fit index (CFI)	Proposed model compared with the null model, adjusted by degrees of freedom	Range between 0 (not fit) to 1.0 (perfect fit); recommendation above .95
Akaike information criterion (AIC)	Compares models with different number of constructs	Value closer to zero indicate better fit and greater parsimony
Parsimony normed fit index (PNFI)	The PRATIO times normed fit index. PRATIO (parsimony ratio) is the ratio of the degrees of freedom in your model to degrees of freedom in the independence (null) model.	When comparing nested models, the model with the lower PNFI is better

One of the commonly used measures of model fit is the *chi-square* test where the

predicted covariance matrix is tested for statistical difference from the original covariance matrix. If the difference is statistically insignificant, the model fit is considered to be good. Besides the chi-square test, there are many other indices used in the testing of model fit. *Normed chi-square* adjusts the chi-square by the degrees of freedom. Values between 1.0-2.0 are considered to indicate a good fit (Hair et al. 1998).

Goodness of fit index (GFI) is calculated by comparing the predicted squared residuals with the obtained residuals. This measure is for absolute fit, and not adjusted by degrees of freedom. The range of this index is between 0 (no fit) and 1.0 (perfect fit). Models with GFI is above .90 are considered to have a good fit. This index has been argued to be insufficient because, for example, it is overly influenced by sample size (Fan et al. 1999).

Non-normed fit index (NNFI) compares the proposed model with a null model. This index is also called Tucker and Lewis' index (TLI). NNFI is adjusted by degrees of freedom and ranges between 0 (no fit) and 1.0 (perfect fit). Models with NNFI above .90 have traditionally been considered to have a good fit. However, it should be noted that when the sample size is small, the NNFI tends to reject correct models too easily (Hu and Bentler 1999).

Comparative fit index (CFI) compares the proposed model to the null model. This index is also adjusted by the degrees of freedom. Also CFI ranges between 0 (no fit) and 1.0 (perfect fit) Models with CFI above .90 are considered to have a good fit (Bentler 1992). However, the recent research recommends higher cut-off value close to .95 (Hu and Bentler 1999).

Akaike information criterion (AIC) compares models with different number of

constructs. AIC is based on information theory. Values closer to zero indicate better fit and greater parsimony. When comparing different models, the model with the lowest AIC is considered to have the best fit (Akaike 1987).

Parsimony normed fit index (PNFI), is equal to the PRATIO times normed fit index. PRATIO (parsimony ratio) is the ratio of the degrees of freedom in your model to degrees of freedom in the independence (null) model. The PNFI takes into account the number of degrees of freedom used to achieve a level of fit. When comparing nested models, the model with the lower PNFI is better (James et al., 1982).

Model misspecification. Finally, after the assessment of the model on the parameter estimate level and the model as a whole, the potential model misspecification is examined. The residual covariance matrix is the discrepancy between the restricted hypothesized model and the sample covariance matrix. Each residual represents the difference between the observed and hypothesized parameter estimate. Large residuals indicate potential misfit in the model. Because the magnitude of residuals is dependent on the measurement units, standardized residuals are typically used in this analysis. Standardized residuals, being defined as fitted residuals divided by their asymptotical standard errors, are analogous to Z scores (Byrne 2001). Jöreskog and Sorbom (1988) suggested a cut-off value of 2.58 residuals to be considered large. In order to identify signs of potential misspecification, residuals are examined in the present study following the above guideline.

Structural equation model is often used to combine confirmatory factor analysis and path analysis. Various processes have been proposed for doing this (Anderson and Gerbing 1988, Mulaik and Millsap 2000). In the present study, a relatively

small sample size prevents the use of these techniques. Instead, path analysis was carried out using separately validated summated scales employing structural equation modeling.

In line with some other recent studies (e.g. Zahra et al. 2000a), the present study used multiple regression analysis with summated scales as the primary analytical method. However, the multiple regression analyses were supplemented with path analyses carried out using structural equation modeling in order to test all the hypotheses simultaneously and to test that there are no other important paths in the model. Path analysis using structural equation model thereby enables a test of the whole model and thereby adds to the multiple regression analyses. The use of two methods to carry out the analyses increases the robustness of the results and conclusions.

4.5 Construct Operationalizations

This section discusses the operationalization of the constructs of the five sub-models tested in this dissertation. The section discusses the selection of the measurement items, inter-item reliability, results of the confirmatory factor analyses and descriptive statistics.

Whenever an objective measure was not available, constructs were operationalized as multi-item scales (Spector, 1992). Whenever possible these constructs and their measurement items were derived from existing research. All frequency/statement-style items were measured on a scale from 1 (never) to 5 (always). Confirmatory factor analysis and Cronbach's alpha tests were used to test the unidimensionality and inter-item reliability of the measures.

The dependent variables in the integrated model are:

- Perceived information
- Value-added
- Formal monitoring
- Informal monitoring
- Resource access
- Knowledge access
- Controls: Venture capital firm age, Venture capital firm size, Ownership of venture capital firm, Location of venture capital firm's ultimate head office

The independent variables in the integrated model are:

- Complementarities
- Guanxi before signing a contract
- Guanxi after signing a contract
- Controls: Venture capital firm age, Venture capital firm size, Ownership of venture capital firm, Location of venture capital firm's ultimate head office

4.5.1 Variables in the Model of Monitoring and Value-added

Mechanisms

There is little research examining the monitoring or value-added activities provided by venture capitalists for technology-based firms in transitional economies and particularly in China. The majority of the previous research on monitoring are based on institutional theory (Peng and Heath, 1996; Brutona and Ahlstrom, 2003) and finds that China's institutional environment creates a number of significant differences from the West in terms of ways of monitoring. One of

the few studies examining the value-added service (White, Gao and Zhang, 2002) compares the different types of venture capital firms (government, corporate, university and foreign-backed) and find that foreign backed venture capital firms provided more value-added service to the investees. However, the starting points for these studies were the general finding in the difference between the West and China or the difference between four types of venture capital firms. The purpose of this study is to create a deeper understanding of the monitoring and value-adding mechanisms and the factors influencing them. Creating this understanding while relying on secondary data would be difficult because of the lack of suitable data and measures for many of the important constructs (Das and Teng, 2000). The research strategy was to rely on primary data collected from key informants, namely the fund managers of venture capital firms.

4.5.1.1 Monitoring

In the model of monitoring mechanisms, the dependent variable is the accuracy and adequacy of the information perceived by venture capital firms. The use of survey-based measures has recently been warranted (Das and Teng, 2000:53). While reliance on dependent variables operationalized using perceptual data may introduce problems, perceptual measures have been argued to be well-suited to the measurement of inter-organizational relationships. Providing empirical support for the reliability of perceptual measures in measuring the value creation provided by venture capitalists, Sapienza (1992), and Sapienza and Gupta (1994) demonstrated high correlation between perceptual value creation measures and venture performance validated by later objective measures and high inter-rater reliability between venture capitalists and entrepreneurs on both sides of the dyads. Similarly, the reliability of perceptual measures has been argued and shown to be good in many of the studies examining analogous situations such as performance of strategic alliances (Bucklin and Sengupta, 1993; Saxton, 1997; Weaver and Dickson, 1998), joint ventures (Geringer and Hebert, 1989, 1991; Lyles and Salk,

1996), and performance in vertical supplier-customer relationships (Anderson and Narus, 1990; Heide and John, 1990; Mohr and Spekman, 1994; Yli-Renko et al., 2001a). The use of perceptual measures in many of the studies has been based on the notion that success is determined, in part, by how well the partnership achieves the performance expectations set by the partners (Anderson and Narus, 1990; Mohr and Spekman, 1994; Saxton, 1997; Weaver and Dickson, 1998).

Following the traditions in research on the performance implications of inter-organizational relationships, we measured the overall accuracy and adequacy information perceived by venture capitalists using a multi-item scales. As the ultimate goal of monitoring is to ease the information asymmetry, we use the information accuracy and sufficiency construct to measure the effect of monitoring requirement demanded by the venture capital investors.

The construct of perceived information was operationalized using ten measurement items. Responses to the ten measurement items were subjected to a principal component analysis using ones as prior communality estimates. The principal axis method was used to extract the factor. Table 4.2 provides the initial eigenvalues table for analysis.

Table 4.2 Initial Eigenvalues

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	7.43	74.33	74.33
2	0.80	7.98	82.32
3	0.38	3.78	86.10
4	0.33	3.35	89.45
5	0.27	2.73	92.17
6	0.24	2.38	94.55
7	0.19	1.93	96.49
8	0.17	1.68	98.17
9	0.11	1.14	99.30

10	0.07	0.70	100.00
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Extraction Method: Principal Component Analysis.

There is only one factor displayed eigenvalues greater than one in table 4.2. The eigenvalue table also shows that the first item account for over 74% of the total variance.

Measurement items and corresponding factor loadings are presented in Table 4.3. All the factor loadings are above .791. Scale reliability was assessed by calculating coefficient alpha (Cronbach, 1951). The Cronbach's alpha inter-item reliability coefficient for this construct is .961 which is pretty high. There is evidence that the items are well measuring a single unidimensional latent construct.

Table 4.3 measurement items and factor loadings for the monitoring construct

Measurement Item	Mean	Std. Deviation	Communality	Loading
Management account	3.621	0.855	0.776	0.881
Balance sheet	3.638	0.912	0.766	0.875
Cash flow	3.828	0.958	0.752	0.867
Decision-making processes	3.897	0.949	0.749	0.866
Product development	3.897	0.810	0.843	0.918
Marketing of product	3.897	0.872	0.695	0.834
Strategy of business	3.759	0.865	0.772	0.879
Patents	3.810	0.868	0.625	0.791
Goodwill	3.603	0.815	0.724	0.851
Training of staff	3.862	0.888	0.731	0.855

Principal Component Analysis. Unrotated

The descriptive statistics of the dependent variable in the model of monitoring mechanisms (factor-based scales) is presented in Table 4.4

Table 4.4 descriptive statistics of the dependent variable in the model of monitoring mechanisms

	N	Minimum	Maximum	Mean	Std. Deviation
Perceived Information Accuracy and adequacy	58	2.4	4.9	3.779	0.760

Constructs Measuring the Monitoring Mechanisms

In the model of monitoring mechanisms, the independent variables are formal and informal monitoring. The control variables are venture age, venture size (total size of funds available to investment in Mainland China), ownership of venture capital firm, and location of venture capital firm. The descriptive statistics of the independent variables in the model of monitoring mechanisms are presented in Table 4.5.

Table 4.5 Descriptive Statistics of the independent variables in the model of monitoring mechanism

	Mean	Median	Std. Deviation	Minimum	Maximum	N
Formal Monitoring	3.417772	3.461538	0.574215	2.384615	4.538462	58
Informal Monitoring	4.031034	4	0.410052	3.2	5	58
Venture age	7.781818	7	3.690282	2	21	55
Size (logarithm)	1.787719	1.69897	0.609519	0.778151	3.041393	53

The confirmatory factor analysis was conducted simultaneously for the two monitoring mechanisms. The factor analysis identified the number of factors above one is two. Table 4.6 shows that the cumulative percent of variance accounted for by factor 1 and 2 is over 74.67%.

Table 4.6 Initial Eigenvalues

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	11.4007	63.3371	63.3371
2	2.0396	11.3314	74.6684
3	0.7658	4.2546	78.9230
4	0.7304	4.0576	82.9806
5	0.5709	3.1719	86.1526
6	0.5164	2.8687	89.0212
7	0.3871	2.1504	91.1717
8	0.3485	1.9359	93.1076

9	0.2749	1.5273	94.6349
10	0.2575	1.4305	96.0654
11	0.1763	0.9795	97.0449
12	0.1616	0.8977	97.9427
13	0.1151	0.6395	98.5822
14	0.0842	0.4680	99.0502
15	0.0653	0.3630	99.4132
16	0.0456	0.2535	99.6667
17	0.0374	0.2080	99.8747
18	0.0226	0.1253	100

Extraction Method: Principal Component Analysis.

The principal factor method was used to extract the factors, and this was followed by a promax (oblique) rotation. In interpreting the rotated factor loading, an item was said to load on a given factor if the factor loading was .40 or greater for that factor, and was less than .40 for the other. Using these criteria five items were confirmed to load on the first factor, which was previously labelled the Informal monitoring factor. Thirteen items also loaded on the second factor, which was labelled the formal monitoring factor. Measurement items and corresponding factor loadings and factor structure are presented in the Table 4.7.

Table 4.7 Rotated factor pattern matrix and Factor structure matrix

Measurement Items	Factor Loading		Factor Structure	
	Formal Monitoring	Informal Monitoring	Formal Monitoring	Informal Monitoring
<i>Formal Monitoring Measurement Items</i>				
Restrictions on changes in ownership	0.6187*	0.2629	0.6719*	-0.0237
Restrictions on mergers & acquisition	0.8783*	0.2272	0.8919*	-0.1659
No capital expenditure beyond certain limits without approval	0.8881*	0.2022	0.8902*	-0.1927
Restrictions on asset disposals	0.8782*	0.1050	0.8401*	-0.2766
Restrictions on additional borrowings	0.8375*	0.2787	0.8767*	-0.1019
Restrictions on top manager's appointment	0.8808*	0.2101	0.8869*	-0.1824
Restrictions on director management's remuneration	0.8351*	0.1987	0.8407*	-0.1735

Audited annual accounts	0.8802*	0.3041	0.9262*	-0.0971
Requirement of certain accounting policies	0.8846*	0.3211	0.9374*	-0.0835
Requirement to use a particular auditing firm	0.8519*	0.2829	0.8916*	-0.1043
Requirement for direct access to investee's accounting system	0.8680*	0.2476	0.8912*	-0.1431
Requirement for monthly management accounts	0.8824*	0.3038	0.9280*	-0.0983
Requirement for evaluation of monthly performance	0.8364*	0.2779	0.8754*	-0.1022
<i>Informal Monitoring Measurement Items</i>				
VCs has seat on board at the investee company	0.2382	0.7944*	0.5521*	0.6189*
VCs has observer seat on board at the investee company	0.0409	0.7942*	0.3733	0.7022*
VCs membership of investee's audit committee	0.2896	0.6631*	0.5431*	0.4782*
Frequency of full board meetings	0.2395	0.7698*	0.5428*	0.5961*
Regular meetings with entrepreneur	0.3475	0.7630*	0.6378*	0.5442*

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Value greater than 0.4 or less than -0.4 have been flagged by an '**'

Formal Monitoring Mechanism

Formal monitoring mechanisms refers to requirements for the provision of detailed and regular information and restriction on management's actions encoded in the contract and enterprise's Articles of Association/Corporate Charter (Purthi, Wright and Lockett, 2003). The formal monitoring mechanism construct was defined using thirteen measurement items. The items were adopted from Grossman and Hart (1986) and Hart (1995) and Purthi, Wright and Lockett (2003) and modified slightly to fit the context of the present study.

The formal monitoring measurement items and corresponding factor

loadings/structure are presented in the Table 4.7. All items loaded on the correct factor and had factor loadings .62 or higher, suggesting a good convergent validity. The Cronbach's alpha inter-item reliability coefficient for this construct is .976, indicating the thirteen measurement items measure the single unidimensional latent construct well.

Informal Monitoring Mechanism

In contrast to formal monitoring mechanisms, which refer to requirements encoded in the contract and enterprise's Articles of Association/Corporate Charter, informal mechanisms refers to all the monitoring activities that are not clearly codified in a formal contract, such as residual rights of control that are bestowed through ownership and monitoring through personal interactions (Grossman and Hart, 1986; Hart, 1995). Informal mechanisms mainly derive from board representation and regular meeting between the venture capitalist and the entrepreneur (Mitchell, Reid and Terry, 1995).

The informal monitoring mechanism construct was defined using five indicators. As before, the items were adopted from Mitchell, Reid and Terry (1995), Hart (1995) and Purthi, Wright and Lockett (2003) and modified slightly to fit the context of the present study. The five informal monitoring measurement items and corresponding factor loadings/structure are presented in the Table 4.7. All items loaded on the factor with factor loadings higher than .66, suggesting a good convergent validity. The Cronbach's alpha inter-item reliability coefficient for this construct is .85, suggesting good reliability for this construct.

4.5.1.2 Value-added

We measured the overall efficacy of value-added offered by venture capitalists

using a multi item scales measuring the value-added support provided by the venture capital investors. The construct was operationalized using three measurement items. The items were adopted from Maula (2003) and modified slightly to fit the context of the present study. Responses to the three measurement items were subjected to a principal component analysis using ones as prior communality estimates. The principal axis method was used to extract the factor. Table 4.8 provides the initial eigenvalues table for analysis.

Table 4.8 Initial Eigenvalues

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	2.526	84.191	84.191
2	0.270	8.990	93.180
3	0.205	6.820	100

Extraction Method: Principal Component Analysis.

There is only the first factor displayed eigenvalues greater than one in table 4.8. The eigenvalue table also shows that the first factor account for over 84% of the total variance.

Measurement items and corresponding factor loadings are presented in Table 4.9. All the factor loadings are above .908. The Cronbach’s alpha inter-item reliability coefficient for this construct is .905. This coefficient exceeds the minimum value of .70 recommended by Nunnally (1978). The high reliability coefficient is suggesting a good reliability for this construct.

Table 4.9 measurement items and factor loadings for the value-added construct

Measurement Item	Communality	Loading
Our value-added support has been critical for our investee’s success	.865	.930
Our value-added support is extremely valuable for our investee.	.825	.908
Our investee are very happy about our value-added support	.836	.914

Principal Component Analysis. Unrotated

The descriptive statistics of the dependent variable in the model of value added mechanisms (factor-based scales) is presented in Table 4.10.

Table 4.10 Descriptive statistics of the dependent variable in the model of monitoring mechanisms

	Mean	Median	Std. Deviation	Minimum	Maximum	N
VC value-added provision	3.7931	3.6667	0.8534	2.3333	5.0000	58

Constructs Measuring the Value-added Mechanisms

In the model of value-added mechanisms, the independent variables are knowledge access and resource access. The control variables are venture age, venture size (total size of funds available to investment in Mainland China), ownership of venture capital firm, and location of venture capital firm. The descriptive statistics of the independent variables in the model of monitoring mechanisms are presented in Table 4.11.

Table 4.11 Descriptive Statistics of the independent variables in the model of monitoring mechanism

	Mean	Median	Std. Deviation	Minimum	Maximum	N
Knowledge access	3.9808	3.6667	0.6051	3	5	58
Resource Access	1.5345	1.0000	1.0796	1	5	58
Venture age	7.781818	7	3.690282	2	21	55
Size (logarithm)	1.787719	1.69897	0.609519	0.778151	3.041393	53

The confirmatory factor analysis was conducted simultaneously for the two value-added mechanisms. The factor analysis identified the number of factors above one is two. Table 4.12 shows that the cumulative percent of variance accounted for by factor 1 and 2 is 74.41%.

Table 4.12 Initial Eigenvalues

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	5.9227	45.5595	45.5595
2	3.7510	28.8536	74.4132
3	0.8334	6.4106	80.8238
4	0.6862	5.2781	86.1020
5	0.4194	3.2258	89.3278
6	0.3346	2.5740	91.9018
7	0.3203	2.4636	94.3654
8	0.2745	2.1116	96.4770
9	0.1895	1.4576	97.9346
10	0.1220	0.9381	98.8727
11	0.0817	0.6287	99.5014
12	0.0405	0.3113	99.8128
13	0.0243	0.1872	100

Extraction Method: Principal Component Analysis.

The principal factor method was used to extract the factors, and this was followed by a promax (oblique) rotation. In interpreting the rotated factor loading, an item was said to load on a given factor if the factor loading was .40 or greater for that factor, and was less than .40 for the other. Using these criteria nine items were confirmed to load on the first factor, which was previously labelled the knowledge access factor. Four items also loaded on the second factor, which was labelled the resource access factor. Measurement items and corresponding factor loadings and factor structure are presented in the Table 4.13.

Table 4.13 Rotated factor pattern matrix and Factor structure matrix

Measurement Items	Factor Loading		Factor Structure	
	Knowledge Access	Resource Access	Knowledge Access	Resource Access
<i>Knowledge Access Measurement Items</i>				
Managerial knowledge	0.7152*	0.0197	0.7104*	-0.0853
Marketing knowledge	0.7994*	-0.0532	0.7830*	-0.1698
Strategic knowledge	0.8686*	-0.0671	0.8494*	-0.1936
Accounting knowledge	0.6955*	0.0422	0.6942*	-0.0602

Market research on investee's products	0.7979*	0.0739	0.8001*	-0.0438
Global competition Information	0.8253*	-0.0149	0.8142*	-0.1357
Local competition Information	0.8532*	-0.0289	0.8398*	-0.1536
Information/knowledge on customer needs & trends	0.8750*	0.0823	0.8776*	-0.0468
Customer list	0.8161*	0.2052	0.8373*	0.0834
<i>Resource Access Measurement Items</i>				
Production facilities	0.0715	0.9636*	0.2120	0.9427*
Technology	0.0028	0.9725*	0.1453	0.9616*
Research & Development	0.0667	0.9388*	0.2035	0.9189*
Distribution Channel	-0.0240	0.9885*	0.1211	0.9813*

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Value greater than 0.4 or less than -0.4 have been flagged by an '**'

Resource Access

Resource access refers to the concrete resources the investee company has acquired or got access to through the investment relationship (Maula, 2001). Resource access can be further divided into resources related to production and technology and resources related to marketing and distribution of the products.

The measurement items for resource access included production facilities, technology, R&D and as distribution channels. These items were adopted from Maula (2001) and modified slightly to fit the context of the present study. The measurement items and factor loadings are presented in Table 4.13. All items loaded on the factor with factor loadings higher than .94 suggesting a good convergent validity. The Cronbach's alpha inter-item reliability coefficient for this construct is .976, indicating the four measurement items measure the single unidimensional latent construct well.

Knowledge Access

In contrast to resource acquisition which refers to accessing concrete resources of the investor through the investor relationship, knowledge access refers to the learning benefits realized in the investor relationship. Start-up companies may learn from their investor about markets, for instance, and customer needs, competition, and technological issues.

The knowledge access construct was defined using nine indicators. The items were adopted from Yli-Renko et al. (2001a) and Kale et al. (2000) and modified slightly to fit the context of the present study. The knowledge access construct is in line with Huber's (1991:97) 'grafting' process of organizational learning. The measures of the knowledge access construct cover access to knowledge on market trends, customer needs, and competition, etc.

The measurement items and factor loadings are presented in Table 4.13. All items loaded on the correct factor with factor loadings higher than .70, suggesting a good convergent validity. The Cronbach's alpha inter-item reliability coefficient for this construct is .928, providing additional evidence of construct validity.

4.5.1.3 The integrated Monitoring and Value-added Model

In the integrated monitoring and value-added model, the independent variables are complementarities and Guanxi (before and after signing a contract). The control variables are venture age, venture size (total size of funds available to investment in Mainland China), ownership of venture capital firm, and location of venture capital firm. The descriptive statistics of the independent variables in the monitoring and value-added model are presented in Table 4.14.

Table 4.14 Descriptive Statistics of the independent variables in the model of monitoring mechanism

	Mean	Median	Std. Deviation	Minimum	Maximum	N
Complementarities	3.7413	3.6	0.6201	2.6	5	52

Guanxi (Pre-Contract)	3.8491	4	0.5276	2.5	5.25	52
Guanxi (Post-Contract)	4.4137	4.5	0.8077	2.75	6	52
Venture age	7.94	7	3.870	2	21	49
Size (logarithm)	1.8559	1.7853	.60833	.78	3.04	47

Complementarities

Literature espousing the resource-based view stresses the strategic importance of exploiting complementarities in resources and capabilities. In addition to resources and capabilities, complementarities can also stem from the product or service offerings of two companies (Amit and Zott 2001, Brandenburger and Nalebuff 1996). Amit and Zott (2001) argued that complementarities are present whenever having a bundle of goods together provides more value than the total value of having each of the goods separately. Similarly, Brandenburger and Nalebuff (1996) stated that, “a player is your complementor if customers value your product more when they also have the other player’s product than when they have your product alone” (1996:18). Complementors are players from whom customers buy complementary products or to whom suppliers sell complementary resources (Brandenburger and Nalebuff 1995). As an example, hardware and software companies are classic complementors. Faster hardware increases users’ willingness to pay for more powerful software. More powerful software, such as the latest Microsoft Office, increases the users’ willingness to pay for faster hardware (Brandenburger and Nalebuff 1995). In this research, complementarities are examined both in resources and capabilities as well as in the products and services offered to customers.

In order to capture the wide range of complementarities, the construct was defined using five indicators covering complementarities both in resources and/or capabilities and in products and/or services. Only one factor over 1.0 emerged in the factor analysis indicating good construct validity. The factor loadings were all

above .78 for this construct. The measurement items and factor loadings of this construct are presented in Table 4.15. The Cronbach's alpha inter-item reliability coefficient for this construct is .887.

Table 4.15 measurement items and factor loadings for the complementarities construct

Measurement Item	Loading
Our resource/knowledge facilitates the use of the investee's products/services	0.7782
Our resource/knowledge completes a solution set that the investee's customers are demanding	0.7952
Our resource/knowledge increases the demand for our investee's products/service	0.8842
Our resource/knowledge is highly complementary with the resource/knowledge of our investee's	0.8932
We have superior capabilities/skills in some areas compare to our investee	0.8388

Extraction Method: Principal Component Analysis. Unrotated

Guanxi

The idea of social networks and networking in the Chinese context captures the indigenous social phenomenon called Guanxi (King, 1991; Luo, 2000; Tsui and Farh, 1997). Guanxi is ubiquitous and comes in many varieties. In this present research, a distinction was made between Guanxi before signing a contract and Guanxi after signing a contract. We argued that the relationship in these two periods is substantially different because two independent companies legally and officially form an alliance after signing a contract.

We argued that the better Guanxi between investor and investee before signing a contract, the more likely the portfolio companies to accept more rigorous restrictions. In order to tackle this research question, it is essential to measure the Guanxi between entrepreneur and venture capitalists before signing a contract. The measurement items and factor loadings of this construct are presented in Table 4.16. Only one factor over 1.0 emerged in the factor analysis indicating good

construct validity. The factor loadings were all above .74 for this construct. The Cronbach's alpha inter-item reliability coefficient for this construct is .828.

Table 4.16 measurement items and factor loadings for the pre-contract Guanxi construct

Measurement Item	Loading
How often are you in contact with your investees at working before signing a contract	0.7433
How often do you meet your Investees after work before signing a contract	0.8178
To what extent do you trust your investees before signing a contract	0.8693
To what extent do you know your investees' senior manager on a personal level before signing a contract	0.8471

Extraction Method: Principal Component Analysis. Unrotated

The first two items (frequency of interaction both formally and informally) were adopted from Lee and Dawes (2005). The two other items (trust and knowledge of investee's people on personal level) have earlier been used by Ganesan (1994), Chen and Peng (2008), Tsai and Ghoshal (1998) and Yli-Renko et al. (2001a) in measuring social interaction in organizational relationships.

Similarly, in informal monitoring mechanism model, Guanxi after signing a contract was defined using four indicators measuring various facets of the social interaction between the venture and the venture capital investor. The measurement items and factor loadings of this construct are presented in Table 4.17. The factor loadings were all above .85 in this construct. The Cronbach's alpha inter-item reliability coefficient for this construct is .868.

Table 4.17 measurement items and factor loadings for the post-contract Guanxi construct

Measurement Item	Loading
How often are you in contact with your investees at working after signing a contract	0.8537
How often do you meet your Investees after work after signing a contract	0.8554
To what extent do you trust your investees after signing a contract	0.8710
To what extent do you know your investees' senior manager on a personal level after	0.8636

4.5.1.4 Control Variables

Firm age was measured in years since founding on the basis of information provided by the respondents. Firm size was measured as the total size of funds available to investment in Mainland China at the end of 2006 according to the information provided by the respondents. The logarithm of the amount of available funds was used in the modelling. Ownership and location of venture capital firm effects were controlled in the multiple regression analyses by including dummy variables in the analyses.

4.6 Reliability and Validity Analysis

In the dissertation, a considerable amount of attention has been given for ensuring the reliability and validity of the results. The hypotheses have been developed based on received theories. Related earlier research has been used when developing the constructs and measurement items. Most reliable available data sources have been used, and the primary data collected in this research has been validated through external validation the measures. Statistical methods have been carefully selected and employed after ensuring fulfilment of the assumptions. Finally, results and conclusions have been carefully analyzed to ensure their feasibility. In the following section, the various elements of reliability and validity are reviewed in more detail (Carmines and Zeller 1979, Litwin 1995, Nunnally 1978, Venkatraman and Grant 1986). A summary of the elements is presented in Table 4.18. In the following sections, the process by which each of these elements has been taken into account in the research is discussed.

Table 4.18 Elements of reliability, validity, and generalizability

Reliability	<ul style="list-style-type: none">• Reliability of data sources• Reliability of measures
Validity	<ul style="list-style-type: none">• Face validity: construct conforms to common understanding of the concept

-
- Content validity: construct covers all relevant facts of the concept
 - Construct validity: construct theoretically reflects the phenomenon under study
 - Convergent validity: different measures of the same construct are correlated
 - Discriminant validity: constructs of the study are conceptually distinct
 - Criterion-related validity: results are in consonance with theory and previous results
 - Concurrent validity: measure is associated with previous validated measure
 - Predictive validity: measure predicts another measure as predicted in theory
-

- Generalizability
- Representativeness
 - Generalizability to other contexts
-

4.6.1 Reliability

Reliability refers to the extent the results of the measurement can be replicated. Reliable measurement values are close to their “true” values with little measurement error. In this dissertation, several methods were used to ensure the reliability. Two dimensions of reliability are explicitly discussed in the next section (1) reliability of the empirical data, and (2) reliability of the constructs.

Reliability of the Empirical Data

Reliability of the empirical data refers to the extent how reproducible the measurement is (Litwin 1995:6). The analyses in the present study are primarily based on primary data collected from the fund managers of venture capital firms because of the lack available secondary data covering the measures of interest of this study. Several steps were taken to ensure the reliability of the single-respondent, self-reported data.

First, in order to maximize the reliability of the data collected by survey, the surveys were administered to key informants (John and Reve, 1982). In this study, there are the fund managers of the venture capital firms who can be considered to be knowledgeable of investment relationships of their investees. In the venture capital industry, the fund manager has typically the closest working relationship with their portfolio companies. No other person in venture capital firms can be expected to be equally knowledgeable of the particular investee relationships and their portfolio companies' performance.

Second, the questionnaire instrument was carefully designed with several rounds of revisions. The questionnaire was tested with several VCs and researchers familiar with the research questions (Fowler 1993:100-102, Spector 1992). Several interviews and the pre-testing of the questionnaire gave confidence to expect that the respondents would not have problems understanding the questions and that they would be knowledgeable about the issues covered by the questionnaire.

Third, the quality of the data appeared to be good. There were very few missing values in the data (only 2.78% of the measurement items missed in the dissertation present). The influence of missing values appeared to be insignificant.

Reliability of the Constructs

Reliability of the constructs refers to the extent the measurement of the constructs can be considered as reliable. Multi-item scales were used to measure all the constructs (Spector 1992). Two main methods were used to examine the reliability of the measurement of the constructs: (1) inter-item reliability of the constructs and (2) test-retest reliability of the constructs.

Inter-item reliability of the constructs refers to the extent measurement items in multi-item scales are correlated with each other. It reflects the degree to which the items represent a common latent unobserved construct. The inter-item reliabilities of the multi-item constructs were tested using the Cronbach's alpha measure. These measures were .872 or more for all constructs in the analysis. The common threshold value for Cronbach's alpha is .70 (Nunnally 1978). Therefore, all the multi-item constructs appear on the basis of this analysis to be highly reliable and have high degree of internal consistency (Thorndike, 1996). The results of the confirmatory factor analyses and Cronbach's alphas of the constructs were reported in section 4.5. The constructs are summarized in Table 4.19.

Table 4.19 Summary of the constructs

	Number of Measurement items	Cronbach's Alpha	N
Perceived Information Accuracy and adequacy	10	.961	52
Formal Monitoring	13	.976	52
Informal Monitoring	5	.850	52
VC value-added provision	3	.905	52
Knowledge access	9	.928	52
Resource Access	4	.976	52
Complementarities	5	.887	52
Guanxi (Pre-Contract)	4	.828	52
Guanxi (Post-Contract)	4	.968	52
Venture age (Years)	1	--	55
Size (Funds)	1	--	53

4.6.2 Validity

Validity refers to the extent a measurement instrument does what it is intended to do (Nunnally 1978:86). In the present study, previously validated measures have been used when possible in order to improve the validity of the study. In the following, the validity of the constructs is discussed in detail divided into four dimensions: face validity, content validity, construct validity, and criterion related

validity (Carmines and Zeller 1979, Litwin 1995, Nunnally 1978).

Face Validity

Face validity refers to the extent a construct conforms to the common understanding of the related concept (Anastasi, 1988), and was ensured in several ways. First, an extensive review of the literature was carried out in order to understand the relevant concepts both in theory and in practice. Second, the constructs and measurement items were developed on the basis of previous research as far as was possible. Third, the questionnaire was developed and pre-tested with venture capitalists in the target group academics with experience in the relevant fields of research. The measures are in line with common understanding of the concepts and previous literature. Therefore, the constructs should have good face validity.

Content Validity

Content validity refers to the extent “to which an empirical measurement reflects a specific domain of content” (Carmines and Zeller, 1979:20; Venkatraman and Grant, 1986). Construct should cover all relevant facets of the concept. In this study, several methods were used to ensure and test content validity. First, extensive literature reviews were carried out in order to understand the phenomena and to identify the most important facets of the constructs. The constructs were developed based on previous research and discussions with entrepreneurs and investors. Second, all the constructs were operationalized using multiple measurement items in order to improve content validity. Content validity was kept in mind when developing the constructs and items measuring the constructs. Third, the questionnaires were also pre-tested with several VCs and researchers familiar

with the research questions. The content validity and the comprehensiveness of the measurement items in measuring the constructs are discussed in more detail in the section discussing the construct operationalization.

Construct Validity

Construct validity refers to the extent to which an operationalization measures the concept it is supposed to measure (Bagozzi et al., 1991). Construct validity can be assessed employing confirmatory factor analysis (Bagozzi et al., 1991; Spector, 1992). In this study, confirmatory factor analysis was employed to confirm the unidimensionality of the multi-item constructs. Confirmatory factor analysis indicated that only one factor was represented in each set of items measuring a construct and that items measuring different constructs did not load on a common factor. In a more in-depth analysis, construct validity can be divided in two dimensions that are tested separately: (1) convergent validity and (2) discriminant validity.

Convergent validity is the degree to which multiple attempts to measure the same concept are in agreement (Bagozzi et al., 1991; Venkatraman and Grant, 1986). Two or more measures of the same concept should covary highly if they are valid measures of the concept (Bagozzi et al., 1991). In this study, several methods were used to ensure and test convergent validity. First of all, earlier validated constructs and measurement items were used whenever possible. Second, new constructs and measurement items were developed on the basis of theory and earlier related research. Third, measurement item level correlation matrices were examined in order to identify potentially low correlations among measurement items belonging to the same constructs. Within factor measurement item correlations were found to be high, with 99% of the within factor inter-item

correlations above .50, and all of them exceeding the recommended cut-off value of .30 (Hair et al., 1998:118). Fourth, confirmatory factor analysis was carried out. All the remaining measurement items load .66 or higher on their primary factor, clearly exceeding the common threshold value of .50 (Hair et al., 1998:111) and indicating a high degree of internal consistency (Thorndike, 1996).

Discriminant validity is the degree to which measures of different constructs are distinct (Bagozzi et al., 1991; Venkatraman and Grant, 1986). If two or more concepts are unique, then valid measures of each should not correlate too highly (Bagozzi et al., 1991). In this study, several methods were used to ensure and test discriminant validity. First, previous validated constructs and measurement items were used whenever possible. Second, new constructs and measurement items were developed based on theory and earlier related research. Third, measurement item level correlation matrices were examined in order to identify potentially high correlations among measurement items belonging to different constructs. Inter-factor measurement item correlations were found to be low, with 96% of the inter-factor correlations below .70, and all of them below the recommended cut-off value of .85 (Dijkstra, et al., 1998).

Furthermore, in order to ensure common method variance (Avolio et al., 1991), we also examined the possibility of common method variance using Harman's single factor test as suggested by Podsakoff and Organ (1986) and Straub (1989). In this procedure, all of items used in the multi-item scales are entered into a factor analysis. Following this, the results of the unrotated factor solution are examined to determine the number of factors that are necessary to account for the variance in the variables. All 57 items yielded 9 factors using the eigenvalue-one criterion combined interpretability criteria (Hatcher, 1994: P22-27). The first factor explained 59% of the variance and the cumulative percent of variance accounted

for by first 9 factors is 82.8%. Based on this analysis, it appears that common method variance is not a serious threat to the validity of this study.

Criterion-Related Validity

Criterion-related validity refers to the extent results are in consonance with theory and previous results. It is used to demonstrate the accuracy of a measure or procedure by comparing it with another measure or procedure which has been demonstrated to be valid. Criterion-related validity can be divided in two dimensions: (1) concurrent validity, and (2) predictive validity. Concurrent validity refers to the extent the measure is associated with previously validated measures (Litwin, 1995:37). There are some earlier validated measures in the study that can be used to determine the concurrent validity. In the measure of Guanxi, two of the measures had been validated by Yli-Renko et al. (2001a) and Tsai and Ghoshal (1998). These measures correlated significantly in the present study, indicating concurrent validity. Similarly, measures of knowledge access were adopted from previously validated constructs and correlated significantly in the present study providing further evidence of the concurrent validity.

Predictive validity refers to the extent the measure predicts another measure as predicted in theory (Hough, 1998). Predictive validity is demonstrated in the results of the tests of the hypotheses. Results on the hypothesis testing are discussed in the next chapter.

4.6.3 Generalizability

Generalizability refers to the extent the results of the study represent the whole population (representativeness) and the extent the results can be generalized to other contexts. The representativeness and the generalizability of the study to other

contexts are discussed in detail in chapter 6.4 'limitations.'

4.6.4 Structural Equation Modelling (SEM) Method

Finally, confirmatory factor analysis within structural equation modelling has been used to assess reliability and validity. The results of the confirmatory factor analyses on the measurement model (first stage of the two-stage modelling procedure) showed the measurement model performed well: standardized factor loadings ranged from 0.52 to 0.99 exceeding clearly the recommended minimum of 0.40 (Ford et al., 1986). The construct reliabilities ranged from 0.872 to 0.976, exceeding the recommended minimum of 0.70. The average variances extracted (AVE) ranged from 0.58 to 0.76, exceeding the recommended minimum of 0.50 (Fornell and Larcker, 1981). Thus, all of the constructs demonstrated good internal consistency and reliability. Discriminant validity of the constructs was evaluated based on the measurement model. Constructs demonstrate discriminant validity when the variance extracted for each is higher than the squared correlation between the constructs (Fornell and Larcker, 1981). We examined each pair of constructs in our measurement model and found that all demonstrate discriminant validity. Convergent validity is also evident from high intra-factor correlations between measurement items (five out of seven intra-factor correlations exceeded 0.50; the remaining two exceeded 0.40). The overall fit of the measurement model is also good. The goodness-of-fit index, non-normed fit index and comparative fit indices are each over the recommended threshold limit of 0.90. The chi-square statistic is also between 1.0 – 2.0 (Hair et al., 1995). Thus, the results indicate that all of the constructs are adequate for use in the second stage.

CHAPTER 5 RESEARCH RESULTS

This chapter presents the empirical results from the analyses. First, descriptive analyses of the sample companies are reported. The objective is to create a clear picture of the venture capital firms included in the analyses. Second, results from the statistical analyses are presented. The analyses are presented in three groups according to the models developed in Chapter 3: (1) model on monitoring mechanisms, (2) model on value-added mechanisms, and (3) model on the role of complementarities and Guanxi in monitoring and value-added. For each set of hypotheses, the correlation structure is first analyzed followed by a multiple regression analysis and mediation tests. Thereafter, an integrated model is tested using structural equation modelling.

5.1 Descriptive Analysis

The descriptive analysis is based on the survey and database variables using nonmissing values. The purpose of the descriptive analysis is to give an overview of the sample firms. In this section, characteristics discussed include firm age, the total size of funds available to investment in Mainland China, location where respondent based, ownership of the organization, respondent's industry preference, and respondent's education background and work experience.

5.1.1 Description of the Sample Firms

Age of the Sample Firms

The age of the sample firms refers to number of total years venture capital firm operated in mainland China at the time of the survey in the end of year 2006. The mean age of the sample companies is 7.78 years. More than 80% of the sample VC

firms were younger than 10 years old (Table 5.1). Particularly, more than 60% of the sample VC firms were set up in 1999, 2000, and 2001. The location of the sample venture capital ultimate head office was used as the indicator for the determination of cross-border (foreign) venture capital firm and domestic venture capital firm. Sample data shows the increase number of venture capital firms after 1996 is mainly driven by domestic venture capital firms. 40 out of 43 sample domestic venture capital firms (93%) were launched after 1996. In contrast, only 5 out of 12 foreign VC firms (42%) were established at the same period.

Table 5.1 Age of sample firms

Year of funded	Frequency	Percent	Nonmissing Percent	Cumulative Percent	Location of ultimate head office (Frequency)	
					In China	Outside China
2	1	1.72	1.82	1.82	0	1
3	1	1.72	1.82	3.64	1	0
4	2	3.45	3.64	7.27	2	0
5	6	10.34	10.91	18.18	5	1
6	13	22.41	23.64	41.82	11	2
7	15	25.86	27.27	69.09	15	0
8	5	8.62	9.09	78.18	4	1
9	2	3.45	3.64	81.82	2	0
10	1	1.72	1.82	83.64	0	1
11	1	1.72	1.82	85.45	0	1
12	1	1.72	1.82	87.27	0	1
13	2	3.45	3.64	90.91	1	1
14	2	3.45	3.64	94.55	1	1
17	1	1.72	1.82	96.36	1	0
19	1	1.72	1.82	98.18	0	1
21	1	1.72	1.82	100	0	1
Sub Total	55	94.82	100		43	12
Missing	3	5.17				
Total	58	100				
Mean	Median	Std. Deviation	Minimum	Maximum		
7.781818	7	3.690282	2	21		

The data reflected the dramatical development of Chinese venture capital

industry. Several important changes happened in the late 1990s that fundamentally changed venture capitalists' perceptions of Chinese firms, especially small private firms, which led to continuing capital inflows. Since 1997, venture capital firms have been set up by local government, corporations, international venture capital funds and even individuals.

As mentioned in Chapter 2, the Chinese government has played an important role in the venture capital boom since 1997. In 1997, Chinese government announced that the private economy is "an important component" of China's economy. In the context of Chinese politics, this language change was a fundamental change of policies and China's Constitution was amended in 1999 to further promote the status of private ownership, with private firms were allowed to be listed on China's domestic stock exchanges in the late 1990s. The listing quota system that heavily favoured state-owned-enterprises (SOEs) was abolished in 2000. These more-secure property rights have encouraged private firms to plan for long-term development and to be more receptive to external financing. Venture capitalists also came increasingly to believe that private firms, especially small private firms, could succeed in China's market.

The Chinese government sees the development of venture capital as a tool to promote China's science and technology (White, Gao and Zhang, 2002) and encouraged the establishment of state owned enterprise (SOE) venture capital firms in the late 1990s to invest in high-tech firms. More than 50 domestic venture capital firms were established by the Chinese governments and SOEs in the late 1990s. The Chinese government also give high-tech firms preferential access to IPOs, with a NASDAQ-like 'second board' established in 2004 which makes it easier for small firms to have IPOs. All these policies have encouraged the establishment of new venture capital firms in late 1990s.

The data also revealed venture capital is a relatively new phenomenon in China. Venture capital investment was brought by foreign venture capitalists. Only 6.9% of the sample domestic VC firms were established before 1997. The sample data was in line with AVCJ's annual report (2002) that shows foreign venture capital firms accounted for more than 90% of the total fund raised from 1991-1997, although the proportion fell to just above 35% from 1998 to 2000.

Size of the Sample Firms

The size of the sample firms was measured in terms of the total size of funds available to investment in Mainland China at the time of the survey in the end of year 2006. On average, the sample companies had US\$157 million funds available to invest in China, with half of the companies having less than US \$50 million, and the biggest firm having US\$1100 million (Table 5.2). Most of sample domestic VC firms have relatively small funds with 36 out of the 42 domestic venture capital firms' (85.7%) fund size below average. In contrast, only 2 out of 11 sample foreign venture capital firms' (18%) have a fund size lesser than average.

Table 5.2 Fund size of the sample firms (USD Million)

Fund Size (US\$Million)	Freque ncy	Percent	Nonmissin g Percent	Cumulativ e Percent	Location of ultimate head office (Frequency)	
					In China	Outside China
6	2	3.45	3.77	3.77	2	0
9	1	1.72	1.89	5.66	1	0
10	1	1.72	1.89	7.55	1	0
12	1	1.72	1.89	9.43	1	0
13	4	6.90	7.55	16.98	4	0
14	1	1.72	1.89	18.87	1	0
15	1	1.72	1.89	20.75	1	0
17	2	3.45	3.77	24.53	2	0

19	1	1.72	1.89	26.42	1	0
21	1	1.72	1.89	28.30	1	0
25	2	3.45	3.77	32.08	2	0
28	2	3.45	3.77	35.85	2	0
30	4	6.90	7.55	43.40	4	0
42	1	1.72	1.89	45.28	1	0
46	1	1.72	1.89	47.17	1	0
50	2	3.45	3.77	50.94	1	1
60	2	3.45	3.77	54.72	2	0
61	1	1.72	1.89	56.60	1	0
64	1	1.72	1.89	58.49	1	0
79	1	1.72	1.89	60.38	1	0
80	1	1.72	1.89	62.26	0	1
100	1	1.72	1.89	64.15	1	0
110	1	1.72	1.89	66.04	1	0
141	2	3.45	3.77	69.81	2	0
150	1	1.72	1.89	71.70	1	0
163	1	1.72	1.89	73.58	1	0
165	1	1.72	1.89	75.47	0	1
170	1	1.72	1.89	77.36	0	1
200	1	1.72	1.89	79.25	0	1
257	1	1.72	1.89	81.13	1	0
300	2	3.45	3.77	84.91	0	2
400	1	1.72	1.89	86.79	0	1
428	1	1.72	1.89	88.68	1	0
450	1	1.72	1.89	90.57	0	1
470	1	1.72	1.89	92.45	1	0
693	1	1.72	1.89	94.34	1	0
800	2	3.45	3.77	98.11	0	2
1100	1	1.72	1.89	100	1	0
Sub Total	53	91.37	100		42	11
Missing	5	8.63				
Total	58	100				
Mean		Median	Std. Deviation	Minimum	Maximum	
157.6226		50	236.927	6	1100	

Geographic location of the Sample Firms

The geographical location of the sample companies was clustered in several key areas following the general geographical distribution of venture capital firms in the

Mainland China. Beijing was the most common spot, with 41.38% of the sample venture capital firms being located there. Shanghai was the second most common location, with 20.69% of the sample venture capital firms. Followed by Guangdong where 12.07% of the sample venture capital firms were based. All of the foreign sample venture capital firms were based either in Beijing or Shanghai (Table 5.3).

Table 5.3 Geographic location of the sample firms

Location	Frequency	Percent	Cumulative Percent	Location of ultimate head office (Frequency)	
				In China	Outside of China
Anhui	1	1.72	1.72	1	0
Beijing	24	41.38	43.10	17	7
Fu Jian	3	5.17	48.28	3	0
Guangdong	7	12.07	60.34	7	0
Hubei	4	6.90	67.24	4	0
Heilongjiang	1	1.72	68.97	1	0
Henan	1	1.72	70.69	1	0
Jilin	1	1.72	72.41	1	0
Jiangsu	2	3.45	75.86	2	0
Shanghai	12	20.69	96.55	7	5
Shanxi	1	1.72	98.28	1	0
Tianjing	1	1.72	100	1	0
Total	58	100		46	12

Ownership of the organization

There are several types of venture capital firms in China. The most mainstream of venture capital firm is government-owned investment firm that helps start up companies either through state or local venture capital funds (Bruton, 2003). Government owned venture capital firms were controlled by national or local government, usually led by the national/local bureau of the science and technology commission and supported by the finance department of national/local government. Government-owned venture capital firms have linkages to the local government and thereby represent preferential access to information and investment opportunities. This can also be a weakness, however, since they are also

susceptible to local government pressure to support new ventures whose risk and return prospects are not attractive (White et al., 2002).

The second most common type of venture firm is an independent venture firm that has no affiliations with any other institution. These firms invest their capital through funds organized as limited partnerships in which the venture capital firm serves as the general partner. These are called “independent firms”.

Venture capital firms may also be affiliates or subsidiaries of an industrial corporations who make investments on behalf of the parent itself. These firms are typically called “corporate venture capital investors.” As most of the big Chinese corporations are state-owned, the government has significant influence on these venture capital firms operations.

There are a number of venture capital firms which are backed by universities. These venture capital firms benefit tremendously from their university ties, giving them privileged access to new venture investment opportunities. On the other hand, their investment opportunities are in practice limited to those that emerge from the university. University-backed venture capital firms generally followed a relatively similar mode of state-owned corporation’s operation (White, Steven, Gao and Zhang, 2002).

The ownership of the sample firms are quite representative of the country at large with 46.55% of the sample firm being government-owned venture capital firms and 36.21% being independent venture capital firms. All of the foreign sample venture capital firms are independent venture firm. 59% of domestic sample firms are government owned. (Table 5.4).

Table 5.4 Ownership of the sample firms

Ownership	Frequency	Percent	Cumulative Percent	Location of ultimate head office (Frequency)	
				In China	Outside of China
Independent VC	21	36.21	36.21	9	12
Corporate VC Firm	9	15.52	51.72	9	0
University-backed VC	1	1.72	53.45	1	0
Government own firm	27	46.55	100	27	0
Total	58	100		46	12

Industry preference of respondent

This research focuses only on the relationship between venture capital firms and their high-technology based start-up investees. As specified earlier, the classification of high technology firms was drawn from the Venture Economics database, which includes seven categories: Biotechnology, Communications, Computer Hardware, Computer Software and Services, Internet Specific, Medical/Health, and new energy. The respondents from foreign venture capital firms mainly invested in semiconductors, internet specific and Medical/Health science areas. Fund managers from domestic venture capital firms prefer semiconductor investment, although their industry preference is quite evenly spread (Table 5.5). The computer software and services sector is most unfavourable for both foreign and domestic venture capitalists as piracy seriously obstructs the software industry's development and their profit perspectives.

Table 5.5 Industry preference of respondent

Ownership	Frequency	Percent	Cumulative Percent	Location of ultimate head office (Frequency)	
				In China	Outside of China
Biotechnology	9	15.52	15.52	9	0
Medical/Health science	7	12.07	27.59	4	3
Internet specific	9	15.52	43.10	5	4
Communications	8	13.79	56.90	8	0
Computer software and services	2	3.45	60.34	2	0

Semiconductors/other electron	18	31.03	91.38	14	4
New energy	5	8.62	100	4	1
Total	58	100		46	12

Respondent's education background and previous work experience

The educational background of respondents spans all the levels of education with 3 (5.17%) at PhD level. While 38 or 65.52% have Master degree including 22 (37.93%) with MBA degree. 17 (29.31%) all have Bachelor degrees. More than half of the respondents from sample foreign venture capital firms have MBA degree while the domestic respondent's academic levels are fairly well distributed (Table 5.6). The majority of the respondents (58.62%) have technology/engineering education background (Table 5.7).

Table 5.6 Education level

Education (Highest Degree)	Frequency	Percent	Cumulative Percent	Location of ultimate head office (Frequency)	
				In China	Outside of China
Phd	3	5.17	5.17	1	2
Master (not MBA)	16	27.59	32.76	15	1
MBA	22	37.93	70.69	15	7
Bachelor	17	29.31	100	15	2
Total	58	100		46	12

Table 5.7 Degree subject

Education (Degree Subject)	Frequency	Percent	Cumulative Percent	Location of ultimate head office (Frequency)	
				In China	Outside of China
Technology/Engineering	34	58.62	58.62	25	9
Finance/Banking	17	29.31	87.93	15	2
Accounting	1	1.72	89.66	0	1
Other	6	10.34	100	6	0
Total	58	100		46	12

The data shows that most of respondents have previous work experience. Only

one respondent hasn't worked anywhere else before joining their current employer. The previous work experience of respondents also varies from banking professionals through civil servants in government. While industry technicians make up the majority of the respondents, more than half of the respondent worked in industry before joining current venture capital firm. There are 7 (12.07%) respondents, all from domestic venture capital firms, who worked in government before joining their current venture capital firm (Table 5.8).

Table 5.8 Previous work experience

Work Experience (industry)	Frequency	Percent	Nonmissing percent	Cumulative Percent	Location of ultimate head office (Frequency)	
					In China	Outside of China
Banking	12	20.69	21.05	21.05	11	1
Venture capital	8	13.79	14.04	35.09	2	6
Industry	30	51.72	52.63	87.72	25	5
Government	7	12.07	12.28	100	7	0
Sub Total	57	98.28	100		45	12
Missing	1	1.72				
Total	58	100				

The average years of venture capital investment experience is 6.09. In terms of venture capital investment experience, respondents from sample foreign venture capital firms clearly have the predominance with 67% having above average investment experience as compared with only 13% from domestic sample firms (Table 5.9). 67% of respondents from sample foreign firms have undertaken venture capital investments outside of China while only 9% of the respondents from domestic firms have the same experience (Table 5.10).

Table 5.9 Years in venture capital industry

Years in VC industry	Frequency	Percent	Nonmissing percent	Cumulative Percent	Location of ultimate head office (Frequency)	
					In China	Outside of China
3	11	18.97	19.30	19.30	9	2
4	12	20.69	21.05	40.35	12	0
5	13	22.41	22.81	63.16	13	0

6	7	12.07	12.28	75.44	5	2
7	1	1.72	1.75	77.19	0	1
8	3	5.17	5.26	82.46	1	2
10	1	1.72	1.75	84.21	0	1
11	2	3.45	3.51	87.72	2	0
12	2	3.45	3.51	91.23	2	0
13	2	3.45	3.51	94.74	1	1
14	1	1.72	1.75	96.49	0	1
15	1	1.72	1.75	98.25	0	1
17	1	1.72	1.75	100	0	1
Sub Total	57	98.28	100		45	12
Missing	1	1.72				
Total	58	100				
Mean		Median	Std. Deviation	Minimum	Maximum	
6.088		5	3.471	3	17	

Table 5.10 Venture capital experience outside of China

VC Experience outside of China	Frequency	Percent	Cumulative Percent	Location of ultimate head office (Frequency)	
				In China	Outside of China
Yes	12	20.69	20.69	4	8
No	46	79.31	100	42	4
Total	58	100		46	12

5.1.2 Summary of the Descriptive Analysis

To summarize the analysis of the characteristics of the sample venture capital firms, it can be said that most of the sample venture capital firms are young. As compared to domestic firms, foreign venture capital firm were relatively larger and only focused on a few industry sectors in the limited geographic area. The majority of the domestic venture capital firms are government owned. They spanned nearly all over the country and invested in every single high-tech industry sector because they have the responsibility to follow the National Technology Development Guideline and balance investment geographically.

5.2 Model on the Monitoring Mechanisms

This section reports the results of analyses testing the model on the monitoring

mechanisms.

5.2.1 Correlations Among Variables

Table 5.11 presents the inter-correlations among variables in the model on the monitoring mechanisms. Correlations indicated that both formal and informal monitoring mechanism factors are significantly correlated with the perceived information accuracy and adequacy from investees ($p \leq 0.001$), as hypothesized. All the correlations are below .75 (recommended threshold value .85) suggesting that multicollinearity should not be a problem in the model.

Table 5.11 Correlations among variables in the model on the value-added mechanisms

Variable	1	2	3	4	5
1 Perceived information	-				
2 Formal monitoring	0.742***	-			
3 Informal monitoring	0.720***	0.554***	-		
4 Firm age	0.138	0.149	0.051	-	
5 Firm Size (log)	0.290*	0.470***	0.238‡	0.324*	-
6 Independent VC (dummy)	0.686***	0.566***	0.626***	0.222	0.406**
7 Corporate VC (dummy)	0.047	0.098	0.045	0.055	-0.199
8 Government-owned VC (dummy)	-0.711**	-0.632**	-0.639**		
9 University subsidiary VC (dummy)	*	*	*	-0.230‡	-0.290*
10 Domestic VC (dummy)	-0.505**		-0.427**	-0.405*	-0.516**
11 Foreign VC (dummy)	0.505***	0.353**	0.427***	0.405**	0.516***

*** $p \leq 0.001$, ** $p \leq 0.01$, * $p \leq 0.05$, ‡ $p \leq 0.10$, two tailed.

5.2.2 Multiple Regression Analysis of Hypotheses

Multiple regression analysis was used to test the hypotheses in the model on the monitoring mechanisms. After confirmatory factor analysis, factor-based scales (Hatcher, 1994) were used in testing the hypothesized relationships between the variables.

Regression Tests of Hypotheses 1-2: formal and informal monitoring influencing the accuracy and adequacy of perceived information from investees

Table 5.12 presents the results of the regression analyses for Hypotheses 1-2. In the table, unstandardized coefficients b-value, standard error of unstandardized coefficients b-value, standardized beta coefficients are presented for independent variables and control variables. For the hypothesized paths, the significance tests are one-tailed. For the control variables, the significance tests are two-tailed. All variables were entered simultaneously. In the regression analysis, variance inflation factors were examined to detect potential problems from multicollinearity. All VIF statistics were 3.1 or lower and tolerance statistics were .322 or higher indicating that multicollinearity should not cause problems in the regression analysis (Myers, 1990; Bowerman and O’Connell, 1990; Menard, 1995).

Table 5.12 Regression Tests of Hypotheses 1-2: formal and informal monitoring influencing the accuracy and adequacy of perceived information from investees

	<i>Predicted direction</i>	<i>Dependent variable: Perceived information</i>		
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>
<i>Independent variable</i>				
Hypothesis 1: formal monitoring	+	0.608	0.123	0.518** *
Hypothesis 2: Informal monitoring	+	0.436	0.181	0.254*
<i>Control variables</i>				
Firm age		0.000	0.019	-0.001
Firm Size (log)		-0.285	0.129	-0.219*
Independent VC (dummy)		0.325	0.201	0.206
Corporate VC (dummy)		0.112	0.235	0.039
University subsidiary VC (dummy)		0.256	0.416	0.046
Foreign VC (dummy)		0.419	0.200	0.223*
<i>Model indices</i>				
R ²				.776

Adjusted R²

.734

F

18.61**

*

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$, † $p \leq 10$, Hypothesized paths one-tailed tests, controls two tailed.

Hypothesis 1 predicted positive relationships between the formal monitoring mechanism and the perceived information accuracy and adequacy. Hypothesis 1 received strong support from the data. Formal monitoring mechanism was significantly positively related to perceived information ($\beta = .518, p \leq 001$). The significant β associated with larger t value indicates the informal monitoring mechanism was making a significant contribution to the model ($t = 4.94$).

Hypothesis 2 predicted a positive relationship between informal monitoring mechanism and the perceived information accuracy and adequacy. This hypothesis also received support from the regression analysis presented in Table 5.12. Informal monitoring was significantly positively related to perceived information ($\beta = .254, p \leq .05$).

Of the control variables, firm size is negatively related to perceived information accuracy and adequacy ($\beta = -.219, p \leq .05$). The smaller the company, the more accurate and adequate perceived information. Also, compared to the base group (domestic venture capital firm), foreign venture capital firms enjoyed more accurate and adequate perceived information through informal monitoring ($\beta = .223, p \leq .05$).

5.3 Model on the Value-added Mechanisms

This section reports the results of analyses testing the model on the value-added mechanisms.

5.3.1 Correlations Among Variables

Table 5.13 presents the correlations among variables in the model on the value-added mechanisms. As hypothesized, correlations indicated that knowledge access was significantly correlated with the value-added provision ($p \leq .001$). However, resource access was not significantly related to value-added provision. This result will be discussed in the next chapter. Most of the correlations are well below .75, and all of the correlations are below recommended threshold value .85 suggesting that multicollinearity should not be a problem in the model.

Table 5.13 Correlations among variables in the model on the value-added mechanisms

Variable	1	2	3	4	5
1 Value-added provision	-				
2 Resource access	0.113	-			
3 Knowledge Access	0.779***	0.069	-		
4 Firm age	0.123	0.022	0.169	-	
5 Firm Size (log)	0.260	-0.076	0.371**	0.324*	-
6 Independent VC (dummy)	0.754***	-0.141	0.835***	0.222	0.406**
7 Corporate VC (dummy)	-0.073	*	-0.146	0.055	-0.199
8 Government-owned VC (dummy)	-0.675**		-0.704**		
9 University subsidiary VC (dummy)	*	-0.249	*	-0.230	-0.290*
10 Domestic VC (dummy)	-0.072	-0.035	-0.094	-0.066	0.004
11 Foreign VC (dummy)	-0.477**		-0.702**	-0.405*	-0.516**
12	*	0.126	*	*	*
13	0.477***	-0.126	0.702***	0.405**	0.516***

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, † $p \leq .10$, two tailed.

5.3.2 Multiple Regression Analysis of Hypotheses

Multiple regression analysis was used to test the hypotheses in the model on the value-added mechanisms. After confirmatory factor analysis, factor-based scales (Hatcher, 1994) were used in testing the hypothesized relationships between the variables.

Regression Tests of Hypotheses 3-4: Resource Access and Knowledge access
Influencing Value-added provision

Table 5.14 presents the results of the regression analyses for Hypotheses 3-4. In the table, unstandardized coefficients b-value, standard error of unstandardized coefficients b-value, standardized beta coefficients are presented for independent variables and control variables. For the hypothesized paths, the significance tests are one-tailed. For the control variables, the significance tests are two-tailed. All variables were entered simultaneously. In the regression analysis, variance inflation factors were examined to detect potential problems from multicollinearity. All VIF statistics were 5.4 or lower and tolerance statistics were .19 or higher indicating that multicollinearity should not cause problems in the regression analysis (Myers, 1990; Bowerman and O'Connell, 1990; Menard, 1995).

Table 5.14 Regression Tests of Hypotheses 3-4: resource access and knowledge access influencing the accuracy and adequacy of perceived information from investees

	<i>Predicted direction</i>	<i>Dependent variable: Value-added provision</i>		
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>
<i>Independent variable</i>				
Hypothesis 3: Resource access	+	0.148	0.114	0.185
Hypothesis 4: Knowledge access	+	0.623	0.293	0.443*
<i>Control variables</i>				
Firm age		0.003	0.026	0.013
Firm Size (log)		-0.089	0.165	-0.062
Independent VC (dummy)		-0.916	0.546	-0.286
Corporate VC (dummy)		-0.775	0.309	-0.453
University subsidiary VC (dummy)		-0.625	0.622	-0.100
Foreign VC (dummy)		-0.105	0.331	-0.050
<i>Model indices</i>				
R ²				.655
Adjusted R ²				.591

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$, † $p \leq 10$, *Hypothesized paths one-tailed tests, controls two tailed.*

Hypothesis 3 predicted positive relationships between resource access and the value-added provision. However, resource access was not significantly positively related to value-added provision ($\beta = .185$, n.s.). The small value of t also suggests resource access was not making a significant contribution to the model ($t = 1.29$). This result will be discussed in the discussion of results in next chapter.

Hypothesis 4 predicted a positive relationship between knowledge access and the value-added provision. This hypothesis received strong support from the regression analysis presented in Table 5.14. Knowledge access is significantly positively related to value-added ($\beta = .443$, $p \leq .05$).

5.4 The role of Complementarities and Guanxi in Integrated Monitoring and Value-added Model

This section reports the results on analyses testing the role of complementarities and Guanxi in integrated monitoring and value-added model.

5.4.1 Correlations Among Variables

Table 5.15 presents the correlations among variables in the role of complementarities and Guanxi in the integrated monitoring and value-added model. Correlations indicate that complementarities, formal monitoring, informal monitoring, perceived information, knowledge access, value-added provision, Guanxi before signing contract, and Guanxi after signing contract were all significantly related to each other. However, resource access was not significantly related to other variables. 90% of the correlations are well below .75,

and all of the correlations are below recommended threshold value .85 suggesting that multicollinearity should not be a problem in the model.

Table 5.15 Correlations among variables in the model on the value-added mechanisms

Variable	1	2	3	4	5	6	7	8	9	10	11
1 Formal monitoring	-										
2 Informal monitoring	0.554***	-									
3 Resource access	0.141	0.205	-								
4 Knowledge Access	0.564***	0.724***	0.069	-							
5 Complementarities	0.601***	0.798***	0.278*	0.839***	-						
6 Guanxi (pre contract)	0.107	-0.098	-0.135	-0.092	-0.280*	-					
7 Guanxi (post contract)	0.620***	0.761***	0.218‡	0.843***	0.816***	-0.149	-				
8 Perceived information	0.742***	0.720***	0.167	0.749***	0.777***	-0.153	0.764***	-			
9 Value-added provision	0.595***	0.647***	0.113	0.779***	0.748***	-0.129	0.784***	0.783***	-		
10 Firm age	0.149	0.051	0.022	0.169	0.127	-0.068	0.097	0.138	0.123	-	
11 Firm Size (log)	0.470***	0.238‡	-0.076	0.371**	0.414**	0.102	0.267‡	0.290*	0.260‡	0.324*	-
12 Independent VC (dummy)	0.566***	0.626***	-0.141	0.835***	0.696***	-0.019	0.780***	0.686***	0.754***	0.222	0.406**
13 Corporate VC (dummy)	0.098	0.045	0.650***	-0.146	0.161	-0.308*	0.054	0.047	-0.073	0.055	-0.199
14 Government-owned VC (dummy)	-0.632***	-0.639***	-0.249‡	-0.704***	-0.772***	0.180	-0.768***	-0.711***	-0.675***	-0.230‡	-0.290*
15 University subsidiary VC (dummy)	0.070	-0.003	-0.035	-0.094	-0.030	0.102	-0.110	0.039	-0.072	-0.066	0.004
16 Domestic VC (dummy)	-0.353**	-0.427***	0.126	-0.702***	-0.616***	0.036	-0.507***	-0.505***	-0.477***	-0.405**	-0.516***
17 Foreign VC (dummy)	0.353**	0.427***	-0.126	0.702***	0.616***	-0.036	0.507***	0.505***	0.477***	0.405**	0.516***

*** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$, ‡ $p \leq 0.1$, two tailed.

5.4.2 Multiple Regression Analysis of Hypothesis

Multiple regression analysis was used to test the role of complementarities and Guanxi in the monitoring and value-added model. After confirmatory factor analysis, factor-based scales (Hatcher, 1994) were used in testing the hypothesized relationships between the variables.

Regression Test of Hypothesis 5: Complementarities Influencing Guanxi

Table 5.16 presents the results of the regression analyses testing the hypothesis of complementarities influencing the Guanxi between venture capitalist and investee both before and after signing a contract. In the table, standardized beta coefficients are presented for independent variables and control variables. For the hypothesized paths, the significance tests are one-tailed. For the control variables, the significance tests are two-tailed. All variables were entered simultaneously. All VIF-statistics for hypotheses 5b were 3.7 or lower and tolerance statistics were .27 or higher indicating that multicollinearity should not cause problems in the regression analysis (Myers, 1990; Bowerman and O'Connell, 1990; Menard, 1995).

Table 5.16 Regression Tests of Hypotheses 5: resource access and knowledge access influencing the accuracy and adequacy of perceived information from investees

	<i>Predicted direction</i>	<i>Dependent variable: Guanxi</i>	
		<i>Before signing contract</i>	<i>After signing Contract</i>
<i>Independent variable</i>			
Hypothesis 5a: Complementarities	-	-0.348	
Hypothesis 5b: Complementarities	+		0.551***
<i>Control variables</i>			
Firm age		-0.062	-0.044
Firm Size (log)		0.286	-0.092

Independent VC (dummy)	0.037	0.544***
Corporate VC (dummy)	-0.265	0.020
University subsidiary VC (dummy)	0.081	-0.045
Foreign VC (dummy)	-0.003	-0.134
<i>Model indices</i>		
R ²	.256	.786
Adjusted R ²	.137	.753
F	2.16***	23.16***

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$, † $p \leq 10$, Hypothesized paths one-tailed tests, controls two tailed.

Hypothesis 5a states that complementarities are positively related to Guanxi before signing a contract. However, complementarities were not significantly related to Guanxi before signing the contract ($p > .172$). This result will be discussed in the next chapter.

Hypothesis 5b states that complementarities are positively related to Guanxi after signing a contract. Hypothesis 5b received strong support from the regression analysis that presented in Table 5.16. Complementarities are significantly positively related to Guanxi between the venture and the venture capital investor after signing the contract ($\beta = .551$, $p \leq .001$). The significant β associated with larger t value indicates the complementarities was making a significant contribution to the Guanxi after venture capitalist signed a contract with investee ($t = 4.1$).

Of the control variables, only the dummy variable “independent venture capital” was significant related to Guanxi after signing contract ($\beta = .544$, $p \leq .001$) indicating that independent venture capitalists, on average, have closer Guanxi with their portfolio companies among several different type of venture capital firms after signing a contract.

Regression Tests of Hypotheses 6 and 10: Complementarities and Guanxi influencing formal monitoring

Table 5.17 presents the results of the regression analyses testing the hypothesis of complementarities and Guanxi influencing the usage of formal monitoring measures. In the table, unstandardized coefficients b-value, standard error of unstandardized coefficients b-value, standardized beta coefficients are presented for independent variables and control variables. For the hypothesized paths, the significance tests are one-tailed. For the control variables, the significance tests are two-tailed. All variables were entered simultaneously. All VIF-statistics were 4.34 or lower and tolerance statistics were .23 or higher indicating that multicollinearity should not cause problems in the regression analysis (Myers, 1990; Bowerman and O'Connell, 1990; Menard, 1995).

Table 5.17 Regression Tests of Hypotheses 6 and 10: Complementarities and Guanxi influencing formal monitoring

	<i>Predicted direction</i>	<i>Dependent variable: Formal monitoring</i>		
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>
<i>Independent variable</i>				
Complementarities	+	0.364	0.214	.345‡
Guanxi (before signing contract)	+	0.309	0.154	.239‡
<i>Control variables</i>				
Firm age		-0.006	0.024	-0.031
Firm Size (log)		0.329	0.149	0.298*
Independent VC (dummy)		0.563	0.240	0.420*
Corporate VC (dummy)		0.560	0.334	0.228
University subsidiary VC (dummy)		0.485	0.502	0.102
Foreign VC (dummy)		-0.378	0.266	-0.236
<i>Model indices</i>				
R ²				.544
Adjusted R ²				.459
F				6.4***

*** $p \leq 0.01$, ** $p \leq 0.01$, * $p \leq 0.05$, ‡ $p \leq 0.10$, Hypothesized paths one-tailed tests, controls two tailed.

In the analysis of factors influencing the formal monitoring, hypotheses 6 predicted a positive relationship between complementarities and formal monitoring. Hypotheses 6 received weak support from the regression analysis presented in Table 5.17. The regression analysis shows complementarities were significantly positively related to the usage of formal monitoring measures ($\beta = .345, p \leq .1$).

Hypotheses 10 predicted a positive relationship between Guanxi and formal monitoring. This hypotheses received support from the data, the regression analysis showed Guanxi was significantly positively related to the usage of formal monitoring measures, although the relationship was weak ($\beta = .239, p \leq .1$).

Of the control variables in this model, only the dummy variable shows independent venture capital was significantly related to formal monitoring ($\beta = .420, p \leq .05$) indicating independent venture capital used relatively more restriction covenants in a formal contract compared to the base group—state owned venture capital firm. Also, firm size is positively related to usage of formal monitoring ($\beta = .298, p \leq .05$). The larger the venture capital company, the more restriction covenants that are used.

Regression Tests of Hypotheses 7 and 11: Complementarities and Guanxi influencing informal monitoring

Table 5.18 presents the results of the regression analyses testing the hypothesis of complementarities and Guanxi influencing the informal monitoring. In the table, unstandardized Coefficients b-value, standard error of unstandardized Coefficients b-value, standardized beta coefficients are presented for independent variables and control variables. For the hypothesized paths, the significance tests are one-tailed.

For the control variables, the significance tests are two-tailed. All variables were entered simultaneously. All VIF-statistics were 5.12 or lower and tolerance statistics were .21 or higher indicating that multicollinearity should not cause problems in the regression analysis (Myers, 1990; Bowerman and O'Connell, 1990; Menard, 1995).

Table 5.18 Regression Tests of Hypotheses 7 and 11: Complementarities and Guanxi influencing informal monitoring

<i>Independent variable</i>	<i>Predicted direction</i>	<i>Dependent variable: Informal monitoring</i>		
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>
Complementarities	+	0.241	0.152	0.291
	+			0.719**
Guanxi (after signing contract)		0.450	0.110	*
<i>Control variables</i>				
Firm age		0.011	0.015	0.068
Firm Size (log)		0.004	0.090	0.005
Independent VC (dummy)		-0.027	0.180	-0.026
Corporate VC (dummy)		-0.184	0.201	-0.095
University subsidiary VC (dummy)		0.209	0.311	0.056
Foreign VC (dummy)		-0.239	0.167	-0.189
<i>Model indices</i>				
R ²				.718
Adjusted R ²				.666
F				13.7***

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, † $p \leq .10$, Hypothesized paths one-tailed tests, controls two tailed.

Hypothesis 7 predicted a positive relationship between complementarities and informal monitoring. This hypothesis did not receive support from the regression analysis. Complementarities are not significantly positively related to informal monitoring ($\beta = .291$, n.s.). This result will be discussed in the discussion of results in next Chapter.

Hypothesis 11 predicted a positive relationship between Guanxi and informal

monitoring. This hypothesis received support from the regression analysis presented in Table 5.18. Guanxi is significantly positively related to informal monitoring ($\beta = .719, p \leq .001$).

Regression Tests of Hypotheses 13: Informal Monitoring relating Formal Monitoring

Table 5.20 presents the results of the regression analyses testing the hypothesis of informal monitoring relating the formal monitoring. In the table, unstandardized coefficients b-value, standard error of unstandardized coefficients b-value, standardized beta coefficients are presented for independent variables and control variables. For the hypothesized paths, the significance tests are one-tailed. For the control variables, the significance tests are two-tailed. All variables were entered simultaneously. All VIF-statistics were 5.13 or lower and tolerance statistics were .20 or higher indicating that multicollinearity should not cause problems in the regression analysis (Myers, 1990; Bowerman and O’Connell, 1990; Menard, 1995).

Table 5.19 Regression Tests of Hypotheses 13: Informal Monitoring influencing Formal Monitoring

	<i>Predicted direction</i>	<i>Dependent variable: Formal Monitoring</i>		
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>
<i>Independent variable</i>				
Informal Monitoring	+	0.598	0.170	0.466**
<i>Control variables</i>				
Firm age		-0.010	0.022	-0.050
Firm Size (log)		0.429	0.133	0.385**
Independent VC (dummy)		0.303	0.222	0.224
Corporate VC (dummy)		0.464	0.255	0.187†
University subsidiary VC (dummy)		0.510	0.467	0.106
Foreign VC (dummy)		-0.186	0.224	-0.115

<i>Model indices</i>	
R ²	.599
Adjusted R ²	.535
F	9.37***

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$, † $p \leq 10$, Hypothesized paths one-tailed tests, controls two tailed.

Hypothesis 13 predicted a positive relationship between informal monitoring and formal monitoring. This hypothesis received support from the regression analysis. Informal monitoring was significantly positively related to formal monitoring ($\beta = .466, p \leq .01$).

Regression Tests of Hypotheses 8 and 14: Complementarities and Guanxi influencing resource access

Table 5.20 presents the results of the regression analyses testing the hypothesis of complementarities and Guanxi influencing the resource access. In the table, unstandardized coefficients b-value, standard error of unstandardized coefficients b-value, standardized beta coefficients are presented for independent variables and control variables. For the hypothesized paths, the significance tests are one-tailed. For the control variables, the significance tests are two-tailed. All variables were entered simultaneously. All VIF-statistics were 5.13 or lower and tolerance statistics were .20 or higher indicating that multicollinearity should not cause problems in the regression analysis (Myers, 1990; Bowerman and O’Connell, 1990; Menard, 1995).

Table 5.20 Regression Tests of Hypotheses 8 and 13: Complementarities and Guanxi influencing resource access

<i>Independent variable</i>	<i>Predicted direction</i>	<i>Dependent variable: Resource Access</i>		
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>
Complementarities	+	0.446	0.373	0.259

Guanxi (after signing contract)	+	0.546	0.269	0.420*
<i>Control variables</i>				
Firm age		0.031	0.037	0.093
Firm Size (log)		0.159	0.221	0.088
Independent VC (dummy)		-0.893	0.440	-0.407
				0.529**
Corporate VC (dummy)		2.119	0.493	*
University subsidiary VC (dummy)		-0.172	0.762	-0.022
Foreign VC (dummy)		-0.631	0.410	-0.241
<i>Model indices</i>				
R ²				.608
Adjusted R ²				.535
F				8.33***

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$, † $p \leq 10$, Hypothesized paths one-tailed tests, controls two tailed.

Hypothesis 8 predicted a positive relationship between complementarities and resource access. This hypothesis didn't receive support from the regression analysis. Complementarities are not significantly positively related to resource access ($\beta = .259$, n.s.). This result will be discussed in the next Chapter. Hypothesis 14 predicted a positive relationship between Guanxi and the resource access. The result of the data analysis supports this hypothesis ($\beta = .358$, $p \leq .05$).

Of the control variables in this model, it can be noted that corporate venture capital was significantly positively related to resource access ($\beta = .529$, $p \leq .001$) indicating corporate venture capital offered significantly more resource access on their portfolio companies among several different type of venture capital firms.

Regression Tests of Hypotheses 9 and 15: Complementarities and Guanxi influencing knowledge access

Table 5.21 presents the results of the regression analyses testing the hypothesis

of complementarities and Guanxi influencing the knowledge access. In the table, unstandardized Coefficients b-value, standard error of unstandardized Coefficients b-value, standardized beta coefficients are presented for independent variables and control variables. For the hypothesized paths, the significance tests are one-tailed. For the control variables, the significance tests are two-tailed. All variables were entered simultaneously. All VIF-statistics were 5.32 or lower and tolerance statistics were .19 or higher indicating that multicollinearity should not cause problems in the regression analysis (Myers, 1990; Bowerman and O'Connell, 1990; Menard, 1995).

Table 5.21 Regression Tests of Hypotheses 9 and 14: Complementarities and Guanxi influencing knowledge access

	<i>Predicted direction</i>	<i>Dependent variable: Knowledge access</i>		
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>
<i>Independent variable</i>				
Complementarities	+	0.337	0.117	0.344**
Guanxi (after signing contract)	+	0.276	0.084	0.372**
<i>Control variables</i>				
Firm age		0.005	0.012	0.027
Firm Size (log)		-0.084	0.069	-0.081
Independent VC (dummy)		0.157	0.138	0.126
Corporate VC (dummy)		-0.359	0.155	-0.157
University subsidiary VC (dummy)		-0.080	0.239	-0.018
Foreign VC (dummy)		0.356	0.129	0.239**
<i>Model indices</i>				
R ²				.880
Adjusted R ²				.858
F				39.57**
				*

*** $p \leq 0.01$, ** $p \leq 0.01$, * $p \leq 0.05$, † $p \leq 0.10$, Hypothesized paths one-tailed tests, controls two tailed.

Hypothesis 9 states that complementarities are positive related to knowledge access. This hypothesis received support from the regression analysis. There was a significant positive relationship between complementarities and knowledge access

($\beta = .344, p \leq .01$).

Hypothesis 15 states that Guanxi are positive related to knowledge access. This hypothesis received strong support from the regression analysis. There was a significant positive relationship between Guanxi and knowledge access ($\beta = .372, p \leq .01$).

Of the control variables in this model, it can be noted that knowledge access offered by foreign venture capital firm was significantly higher than the base group, i.e. the domestic venture capital firm ($\beta = .239, p \leq .01$).

Regression Tests of Hypotheses 18: Value-added Influencing Monitoring

Table 5.22 presents the results of regression analysis testing the hypotheses 18. In the table, unstandardized coefficients b-value, standard error of unstandardized coefficients b-value, standardized beta coefficients are presented for independent variables and control variables. For the hypothesized paths, the significance tests are one-tailed. For the control variables, the significance tests are two-tailed. All variables were entered simultaneously. All VIF-statistics were 3.44 or lower and tolerance statistics were .291 or higher indicating that multicollinearity should not cause problems in the regression analysis (Myers, 1990; Bowerman and O’Connell, 1990; Menard, 1995).

Table 5.22 Regression Tests of Hypotheses 18: Valued added influencing Monitoring

<i>Independent variable</i>	<i>Predicted direction</i>	<i>Dependent variable: Perceived information</i>		
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>
Value-added	+	0.496	0.113	0.552***
<i>Control variables</i>				

Firm age	-0.016	0.022	-0.068
Firm Size (log)	0.021	0.135	0.016
Independent VC (dummy)	0.430	0.231	0.273‡
Corporate VC (dummy)	0.478	0.255	0.166‡
University subsidiary VC (dummy)	0.702	0.470	0.126
Foreign VC (dummy)	0.215	0.228	0.115
<i>Model indices</i>			
R ²			.697
Adjusted R ²			.649
F			14.44***

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$, ‡ $p \leq 10$, Hypothesized paths one-tailed tests, controls two tailed.

Hypothesis 18 predicted a positive relationship between monitoring and value-added. This hypothesis received strong support from the regression analysis presented in Table 5.22. Value-added is significantly positively related to perceived information ($\beta = .552$, $p \leq .001$).

Of the control variables in this model, it can be noted that through valued added activities independent venture capital and corporate venture capital firms perceived more accurate and adequate information from portfolio companies ($p \leq .10$).

5.4.3 Multiple Regression Analysis of Mediation Effects

Regression Test of Hypothesis 12: Guanxi mediating Complementarities influence to informal monitoring

Three formal tests of mediation developed by Goodman (1960), Sobel (1982), and Aroian (1944/1947) were introduced in the methods section (Chapter 4). The results of the Sobel's, Aroian's and Goodman's test of mediation are presented in Table 5.23. All the test identify the statistically significant mediation ($p \leq .001$). Guanxi is the mediator that mediates complementarities influence to informal

monitoring.

Table 5.23 Mediation test of Guanxi mediating the positive relationship between complementarities and informal monitoring

<i>Independent variables</i>	<i>Dependent variables: Guanxi</i>		<i>Dependent variables: Informal monitoring</i>	
	B	Std. Error	B	Std. Error
Guanxi			.451	.080
Complementarities	1.063	.101	.086	.105
<i>Test Statistic</i>			<i>Z-value</i>	<i>P-value</i>
Sobel Test			4.969	.001
Aroian Test			4.952	.001
Goodman Test			4.987	.001

However, the three tests do not tell one whether partial or full mediation has occurred. To identify the partial or full mediation, we followed the Baron and Kenny (1986) and Judd and Kenny's (1981) four steps in testing mediation that discussed in the methods section for establishing mediation (Chapter 4.4.3). Table 5.24 presents the results of the four steps in testing the mediating effects of Guanxi mediating the complementarities influence to informal monitoring. In Step 1, complementarities (independent variable) are shown to be significantly related to informal monitoring (dependent variable). This is shown in the first model in Table 5.24 ($\beta = .687, p \leq .001$). In the second step, complementarities (independent variable) are shown to be significantly related to Guanxi (mediator variable). This is shown in the second model in Table 5.24 ($\beta = .551, p \leq .001$). In Step 3, Guanxi (mediator variable) is shown to be significantly related to informal monitoring (dependent variable). This is shown in the third model in Table 5.24 ($\beta = .719, p \leq .001$). In this third regression model, both the independent variable and the mediator variable are included in the analysis simultaneously. In Step 4, it is shown that inclusion of Guanxi (mediator variable) in the regression with complementarities (independent variable) reduces the influence of complementarities on informal monitoring. In order to be able to claim complete

mediation in this testing sequence, the effect of the independent variable should be zero when the mediator is included. In this analysis, the effect of complementarities was no longer significant after the inclusion of the mediator ($\beta = .291$, n.s.). Therefore, a full mediation has been identified. It can be claimed that Guanxi fully mediates the relationship between complementarities and informal monitoring.

Table 5.24 Regression Tests of Hypotheses 12: Guanxi mediating Complementarities influence to informal monitoring

<i>Independent variable</i>	<i>Dependent variable</i>		
	<i>Informal monitoring</i>	<i>Guanxi</i>	<i>Informal monitoring</i>
Complementarities	0.687***	0.551***	0.291
Guanxi (after signing contract)			0.719***
<i>Control variables</i>			
Firm age	0.036	-0.044	0.068
Firm Size (log)	-0.061	-0.092	0.005
Independent VC (dummy)	0.365*	0.544***	-0.026
Corporate VC (dummy)	-0.081	0.020	-0.095
University subsidiary VC (dummy)	0.023	-0.045	0.056
Foreign VC (dummy)	-0.285‡	-0.134	-0.189
<i>Model indices</i>			
R ²	.608	.786	.718
Adjusted R ²	.546	.753	.666
F	9.75***	23.16***	13.71***

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$, ‡ $p \leq 10$, Hypothesized paths one-tailed tests, controls two tailed.

Regression Test of Hypothesis 16: Guanxi mediating complementarities influence to resource access

Three more formal tests of mediation developed by Goodman (1960), Sobel (1982), and Aroian (1944/1947) were introduced in the methods section (Chapter 4). The results of the Sobel's, Aroian's and Goodman's test of mediation are

presented in Table 5.25. All the test indicate mediation effects are not statistically significant ($p \geq .05$). Guanxi is not the mediator that mediates complementarities influence to resource access.

Table 5.25 Mediation test of Guanxi mediating the positive relationship between complementarities and Resource Access

<i>Independent variables</i>	<i>Dependent variables: Guanxi</i>		<i>Dependent variables: Resource Access</i>	
	B	Std. Error	B	Std. Error
Guanxi			.292	.174
Complementarities	1.063	.101	.484	.223
<i>Test Statistic</i>			<i>Z-value</i>	<i>P-value</i>
Sobel Test			1.657	.097
Aroian Test			1.649	.099
Goodman Test			1.664	.096

Regression Test of Hypothesis 17: Guanxi mediating Complementarities influence to knowledge access

Three more formal tests of mediation developed by Goodman (1960), Sobel (1982), and Aroian (1944/1947) were introduced in the methods section (Chapter 4). The results of the Sobel's, Aroian's and Goodman's test of mediation are presented in Table 5.26. All the test indicate statistically significant mediation effects ($p \leq .001$). Guanxi is the mediator that mediates complementarities influence to knowledge access.

Table 5.26 Mediation test of Guanxi mediating the positive relationship between complementarities and informal monitoring

<i>Independent variables</i>	<i>Dependent variables: Guanxi</i>		<i>Dependent variables: Knowledge Access</i>	
	B	Std. Error	B	Std. Error
Guanxi			.639	.052
Complementarities	1.063	.101	.818	.071
<i>Test Statistic</i>			<i>Z-value</i>	<i>P-value</i>
Sobel Test			7.993	.000
Aroian Test			7.978	.000

Goodman Test	8.008	.000
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To identify whether partial or full mediation has occurred, we followed the Baron and Kenny (1986) and Judd and Kenny's (1981) four steps in testing mediation that discussed in the methods section for establishing mediation (Chapter 4.4.3). Table 5.27 presents the results of the four steps in testing the mediating effects of Guanxi mediating the complementarities influence to knowledge access. In Step 1, complementarities (independent variable) are shown to be significantly related to knowledge access (dependent variable). This is shown in the first model in Table 5.27 ($\beta = .549, p \leq .001$). In the second step, complementarities (independent variable) are shown to be significantly related to Guanxi (mediator variable). This is shown in the second model in Table 5.27 ($\beta = .551, p \leq .001$). In Step 3, Guanxi (mediator variable) is shown to be significantly related to knowledge access (dependent variable). This is shown in the third model in Table 5.27 ($\beta = .372, p \leq .01$). In this third regression model, both the independent variable and the mediator variable are included in the analysis simultaneously. In Step 4, it is shown that inclusion of resource acquisition (mediator variable) in the regression with complementarities (independent variable) reduces the influence of complementarities on knowledge access. In order to be able to claim complete mediation in this testing sequence, the effect of the independent variable should be zero when the mediator is included. In this analysis, complementarities still remain significant after the inclusion of the mediator ($\beta = .344, p \leq .01$). Therefore, a partial mediation has been identified. On the basis of this testing sequence, it can be claimed that Guanxi partially mediates the relationship between complementarities and knowledge access.

Table 5.27 Regression Tests of Hypotheses 18: Guanxi mediating Complementarities influence to informal monitoring

<i>Independent variable</i>	<i>Dependent variable</i>		
	<i>Knowledge access</i>	<i>Guanxi</i>	<i>Knowledge access</i>
<i>Independent variable</i>			
Complementarities	0.549***	0.551***	0.344**
Guanxi (after signing contract)			0.372**
<i>Control variables</i>			
Firm age	0.010	-0.044	0.027
Firm Size (log)	-0.116	-0.092	-0.081
Independent VC (dummy)	0.328**	0.544***	0.126
Corporate VC (dummy)	-0.150	0.020	-0.157*
University subsidiary VC (dummy)	-0.035	-0.045	-0.018
Foreign VC (dummy)	0.189	-0.134	0.239***
<i>Model indices</i>			
R ²	.851	.786	.880
Adjusted R ²	.827	.753	.858
F	35.85***	23.16***	39.57***

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$, † $p \leq 10$, Hypothesized paths one-tailed tests, controls two tailed.

5.5 Integrated Structural Equation Model

This section presents the results from the test of the model integrating the previously tested sub-models. Path analysis is carried out using structural equation modelling.

5.5.1 Model Fit and Nested Model Testing

Following the procedure outlined in Chapter 4.4 describing the use of structural equation modelling in this study, we first examined the feasibility of the parameter estimates. The parameter-level examination indicates a good model fit. No correlations above 1.00, or negative variances were found (Byrne 2001:75). The determinant of sample covariance matrix was also positive definite. Standard errors were also reasonable and the direction and significance of the parameters

were according to the underlying theories and hypotheses in fifteen out of sixteen hypothesized parameters, also suggesting good fit of the model. These analyses should reveal potential severe violations in the model fit. Based on these analyses, the model appears to behave well. The parameter estimates are further discussed in later sections discussing the results of hypotheses testing.

Table 5.28 Goodness of fit statistics for the structural equation models

<i>Model</i>	χ^2	<i>df</i>	<i>p</i>	<i>Normed χ^2</i>	<i>GFI</i>	<i>NNFI</i>	<i>CFI</i>	<i>AIC</i>	<i>PNFI</i>
1 Null Model	442	36	.000	12.28	.275	.000	.000	460	.445
2 Hypothesized model	28.7	19	.071	1.51	.900	.955	.976	80.7	.095
3 Full mediation model I	29.4	20	.080	1.47	.899	.958	.977	79.4	.091
4 Full mediation model II	43.1	20	.002	2.154	.866	.898	.943	93.1	.142
5 Full mediation model III	30.5	20	.062	1.53	.894	.953	.974	80.5	.096

Full mediation model I: Direct path deleted between complementarities and informal monitoring.
 Full mediation model II: Direct path deleted between complementarities and knowledge access.
 Full mediation model III: Direct path deleted between complementarities and resource access.
 Normed Chi-square = Chi-square adjusted by degrees of freedom, GFI = Jöreskog and Sörbom's goodness-of-fit index, compares predicted squared residuals with obtained residuals, not adjusted by degrees of freedom; NNFI = Non-Normed Fit Index (Tucker and Lewis' index) compares proposed model to null model, adjusted by degrees of freedom; and CFI = compares proposed model to null model, adjusted by degrees of freedom; AIC = Akaike information criterion; PNFI = Parsimonious normed-fit index.

The next phase of the analysis is the examination of the model as a whole. To support the claim of model testing, a nested model approach recommended by Anderson and Gerbing (1988) was used. Five different nested models were estimated, and the fit statistics are provided Table 5.28. Goodness of fit statistics demonstrates hypothesized model (model 2), full mediation model I (model 3) and full mediation model III (model 5) all met the fit criteria. These three models of perfect model fit in the population are all rejected at the .05 level. The Chi-square tests indicate a significant difference between the hypothesized and observed covariance matrices. The Normed Chi-square statistics are within acceptable threshold limits--1.0–2.0 or 3.0 (Hair et al. 1998). Values very close to or above .90 on the goodness-of-fit index and non-normed fit index are also desirable (Bentler and Bonett, 1980). The hypothesized model achieved these confines. The comparative fit index values were over .974 exceeding the new strict criteria

of .950 thus indicating a good fit (Hu and Bentler 1999). Both the Akaike information criterion and parsimonious normed-fit index was relatively smaller among 5 models.

As hypothesized model (model 2), full mediation model I (model 3) and full mediation model III (model 5) all met the fit criteria, a nested model approach recommended by Loehlin (1987:62-67) was employed to assess the fit of the hypothesized model and to test its robustness by comparing it to other alternative models. Nested model tests are means of internally validating a hypothesized model by comparing the Chi-squares of models that differ in the number of paths hypothesized. Nested models can be derived from each other by adding or deleting paths. A significant difference in Chi-square indicates that the more complex model provides a better fit with the data (Steiger et al. 1985: 254).

The five nested models compared in the analysis are: (1) a null model, in which no relationships are posited; (2) the hypothesized model; (3) a full mediation model in which a direct path deleted between complementarities and informal monitoring; (4) a full mediation model in which a direct path deleted between complementarities and knowledge access; and (5) a full mediation model in which a direct path deleted between complementarities and resource monitoring. Table 5.29 summarizes the testing sequence employed.

Table 5.29 Nested model testing sequence and difference tests

<i>More Parsimonious Model</i>		<i>Less Parsimonious Model</i>	Δx^2	Δdf	<i>p</i>	<i>Preferred</i>
1 Null Model	vs	2 Hypothesized model	413.3	17	<.001	Model 2
3 Full mediation model I	vs	2 Hypothesized model	0.7	1	>.25	Model 2
4 Full mediation model II	vs	2 Hypothesized model	14.4	1	<.001	Model 2
5 Full mediation model III	vs	2 Hypothesized model	1.8	1	>.20	Model 2

In the testing sequence, the first comparison is the comparison between the hypothesized model and the null model. The goodness-of-fit statistics (Table 5.28)

and the nested model test (Table 5.29) indicate that the hypothesized model provides a significant better fit than the null model.

The second comparison is a robustness test testing the strength of the mediation effect of Guanxi mediating the complementarities effects to informal monitoring. In this comparison, the hypothesized model was compared to the full mediation model in which a direct path was deleted from the hypothesized model between complementarities and informal monitoring. The difference in Chi-square is 0.7. A table of Chi-square indicates that the critical value of Chi-square with 1 degree of freedom is 3.841 ($p < .05$), indicating that there was not significant difference between the hypothesized model and parsimonious model.

The third comparison is a robustness test testing the strength of the mediation effect of Guanxi mediating the complementarities effects to knowledge access. In this comparison, the hypothesized model was compared to the full mediation model in which a direct path was deleted from the hypothesized model between complementarities and knowledge access. The goodness-of-fit statistics (Table 5.28) and the nested model test (Table 5.29) indicate that the hypothesized model provides a significantly better fit than the parsimonious full mediation model II.

The fourth comparison is a robustness test testing the strength of the mediation effect of Guanxi mediating the complementarities effects to resource access. In this comparison, the hypothesized model was compared to the full mediation model in which a direct path was deleted from the hypothesized model between complementarities and resource access. The difference in Chi-square is not significant ($p > .20$).

Having tested all the relevant model alternatives, we conclude that the

hypothesized model (Model 2) provides the best fit and terminate the model testing. Figure 5-1 presents the diagram of the full mediation model I (Model 3) tested using structural equation modelling.

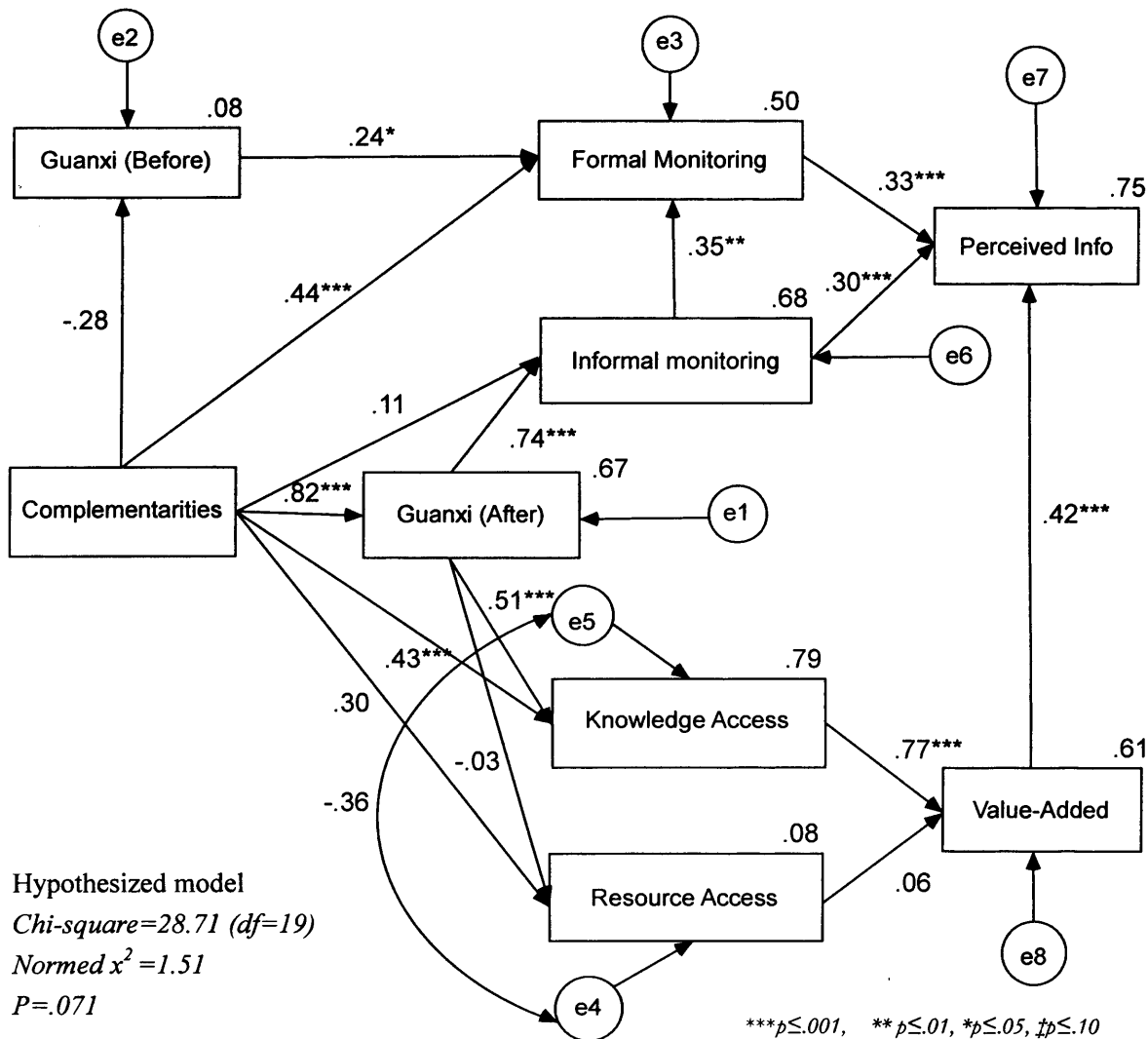


Figure 5-1 Structural equation-modelling results of the hypothesized integrated model

5.5.2 Path Analyses

Testing the fit of the hypothesized model and finding no signs of misspecification allowed testing of the hypotheses made in the hypothesized model. Table 5-30 presents the standardized maximum likelihood parameter estimates and their statistical significance levels for the hypothesized path model.

In the hypothesized model, sixteen relationships are tested. Eleven out of sixteen hypotheses received significant support from the empirical data.

Table 5.30 Structure equation modelling tests of hypotheses

<i>Hypothesis</i>	<i>Description of Path</i>		<i>Coefficient</i>
<i>Model on Monitoring mechanisms</i>			
H1	Formal monitoring	→ (+) Perceived information	.33***
H2	Informal monitoring	→ (+) Perceived information	.30***
<i>Model on Value-added mechanisms</i>			
H3	Resource access	→ (+) Value-added	.06
H4	Knowledge access	→ (+) Value-added	.77***
<i>Model on the role of complementarities in monitoring and Value-added</i>			
H5a	Complementarities	→ (+) Guanxi before signing contract	-.28
H5b	Complementarities	→ (+) Guanxi after signing contract	.82***
H6	Complementarities	→ (+) Formal monitoring	.44***
H7	Complementarities	→ (+) Informal monitoring	.11
H8	Complementarities	→ (+) Resource access	.30
H9	Complementarities	→ (+) Knowledge access	.43***
<i>Model on the role of Guanxi as a facilitator in value-added and monitoring mechanism</i>			
H10	Guanxi before signing contract	→ (+) Formal monitoring	.24*
H11	Guanxi after signing contract	→ (+) Informal monitoring	.74***
H13	Informal monitoring	→ (+) Formal monitoring	.35**
H14	Guanxi after signing contract	→ (+) Resource access	-.03
H15	Guanxi after signing contract	→ (+) Knowledge access	.51***
<i>Model on relationship between value added and monitoring mechanism</i>			
H18	Value-added	→ (+) Perceived information	.42***

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$, hypothesized paths one-tailed tests

Model on the Monitoring Mechanisms

The first set of hypotheses predicts the monitoring mechanisms through which venture capital investments may increase the perceived information accuracy and adequacy venture capitalist receives from portfolio companies. The first hypothesis (Hypothesis 1) predicts formal monitoring is positively related to perceived information accuracy and adequacy. This hypothesis received strong support from the data ($\beta = .33$, $p \leq .001$). Hypothesis 2 states that that informal monitoring is positively related to perceived information accuracy and adequacy.

This hypothesis received strong support from the data as well ($\beta = .30, p \leq .001$).

Model on the Value-added Mechanisms

The second set of hypotheses indicates the mechanisms through which venture capital investments may add value to portfolio companies. Hypothesis 4 states that that knowledge access was positively related to value-added. This hypothesis received strong support from the data ($\beta = .77, p \leq .001$). Hypothesis 3 predicts resource access is positively related to value-added. This hypothesis didn't receive support from the data ($\beta = .06, n.s.$). We will discuss potential reasons for this surprising result in the discussion of the results in Chapter 6.

Model on the Role of Complementarities in Monitoring and Value-added

The third set of hypotheses concerns complementarities affecting monitoring and value-added mechanisms. The first hypothesis (Hypothesis 5) predicts the influences of complementarities on two different stages of Guanxi. Hypothesis 5a, which states that complementarities are positively related to Guanxi before signing contract, didn't receive support from the data ($\beta = -.28, n.s.$). We will discuss potential reasons for this surprising result in the discussion of the results in Chapter 6.1.1. Hypothesis 5b states that complementarities are positively related to Guanxi after signing contract. The data shows complementarities were significantly related to Guanxi after signing contract ($\beta = .82, p \leq .001$).

The next two hypotheses predict the complementarities influencing two types of monitoring mechanism. Hypothesis 6 states that complementarities are positively related to formal monitoring. This hypothesis received strong support from the data ($\beta = .44, p \leq .001$). Hypothesis 7 states that complementarities are positively

related to informal monitoring. However, this hypothesis didn't receive support from the data ($\beta = .11$, n.s.). We will discuss potential reasons for this surprising result in the discussion of the results in Chapter 6.

Finally, Hypothesis 8 and 9 predict the complementarities influencing two types of value added mechanism. Hypothesis 9 states that complementarities are positively related to knowledge access. This hypothesis also received support from the data ($\beta = .43$, $p \leq .001$). Hypothesis 8 states that complementarities are positively related to resource access. However, this hypothesis didn't receive support from the data ($\beta = .30$, n.s.). We will discuss potential reasons for this surprising result in the discussion of the results in Chapter 6.1.1.

Model on the role of Guanxi as a facilitator in monitoring and value-added mechanism

The fourth set of hypotheses concerns Guanxi affecting monitoring and valued added mechanisms. The first hypothesis in this set of hypotheses (Hypothesis 10) states that Guanxi before signing a contract is positively related to formal monitoring. This hypothesis received support from the data ($\beta = .24$, $p \leq .05$). Hypothesis 11 states that Guanxi after signing contract is positively related to informal monitoring. This hypothesis received strong support from the data ($\beta = .74$, $p \leq .001$). hypothesis 13 states that informal monitoring is positively related to formal monitoring. This hypothesis received support from the data ($\beta = .35$, $p \leq .01$).

The next two hypotheses predict the Guanxi after signing contract influencing two types of value-added mechanism. Hypothesis 14 states that Guanxi after signing contract is positively related to resource access. This hypothesis didn't

receive support from the data ($\beta = -.03$, n.s.). Hypothesis 15 states that Guanxi after signing contract is positively related to knowledge access. This hypothesis received support from the data ($\beta = .51$, $p \leq .001$).

Model on relationship between value added and monitoring

Finally, Hypothesis 18 predicts the value-added influencing the result of monitoring. Hypothesis 18 states that value-added activities increase venture capitalists perceived information's accuracy and adequacy from portfolio companies. This hypothesis received strong support from the data ($\beta = .42$, $p \leq .001$).

Mediation Effects

Hypothesis 12 predicts that Guanxi mediates the influence of complementarities on informal monitoring. The statistical results presented in Table 5.23 shows the Sobel's t (or z) value was sufficiently large and yielding a p-value of less than .01, indicating a significant mediation which means, in practice, the association between the complementarities and the informal monitoring has been significantly reduced by the inclusion of the mediating variable (Guanxi).

To determine a partial or full mediation for specific relationships, we followed the four steps discussed in the methods section for establishing mediation (Chapter 4.4.3). The statistical results are presented in Table 5.31. First, the independent variable (complementarities) was shown to be related to the mediator (Guanxi). Second, the mediator was shown to be related to the dependent variable (informal monitoring). Third, the relationship between the independent variable (complementarities) and the dependent variable (informal monitoring) was shown

to be insignificant when the mediator is accounted for. Thus, it appears that Guanxi fully mediates the relationship between complementarities and informal monitoring.

Table 5.31 Path analysis of Hypothesis 12

<i>Path description</i>	<i>Model 2</i>	<i>Model 3</i>
Complementarities → (+) Guanxi	.82***	.82***
Guanxi → (+) Informal monitoring	.74***	.83***
Complementarities → (+) Informal monitoring	.11	

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$,

Hypothesis 16 predicts that Guanxi mediates the influence of complementarities on resource access. The results of the four steps mediation tests presented in Table 5.32 show there are not significant relationship between mediator (Guanxi) and dependent variable (informal monitoring).

Table 5.32 Path analysis of Hypothesis 16

<i>Path description</i>	<i>Model 2</i>	<i>Model 4</i>
Complementarities → (+) Guanxi	.82***	.82***
Guanxi → (+) Resource Access	-.03	.22
Complementarities → (+) Resource Access	.30	

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$,

Hypothesis 17 predicts that Guanxi mediates the influence of complementarities on knowledge access. We followed the same four steps discussed earlier. The statistical results presented in Table 5.26 shows the Sobel's t (or z) value was sufficiently large and yielding a p-value of less than .01, indicating a significant mediation which means, in practice, the association between the complementarities and the knowledge access has been significantly reduced by the inclusion of the mediating variable (Guanxi). Furthermore, the regression test results presented in Table 5.27 indicate that Guanxi mediates the relationship between complementarities and knowledge access cannot be claimed that the mediation would be a full mediation.

To determine whether a partial or full mediation has occurred, we tested this hypothesis by examining the results of the nested model tests and then analyzing the specific relationships between the constructs. In the nested model tests (Table 5.29), the hypothesized mediation model (Model 2) provided a better fit than the alternative full mediation model in which a direct path was deleted to the hypothesized model between complementarities and knowledge access (Model 5). This result provides evidence in support of a partial mediating role of Guanxi in mediating the effects of complementarities. Furthermore, the path analysis of model 2 and model 5 (Table 5.33) also identified a partial mediation as the association between the complementarities and the knowledge access is still significant after inclusion of the mediating variable (Guanxi). Thus, it appears that Guanxi partially mediates the relationship between complementarities and knowledge access.

Table 5.33 Path analysis of Hypothesis 17

<i>Path description</i>	<i>Model 2</i>	<i>Model 3</i>
Complementarities → (+) Guanxi	.83***	.83***
Guanxi → (+) Knowledge access	.65***	.91***
Complementarities → (+) Knowledge access	.31**	

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$,

Table 5.34 provides further evidence of the critical role of Guanxi and complementarities in China. In this table, the standardized total effects of Guanxi and complementarities on all endogenous variables are estimated on the basis of the structural equation model results for the hypothesized model. The coefficients are relatively high for all endogenous variables.

Table 5.34 Standardized total effect

	<i>Complementarities</i>	<i>Post-Guanxi</i>	<i>Pre-Guanxi</i>
Perceived Information	0.693	0.468	0.079
Formal Monitoring	0.621	-	0.243

Informal Monitoring	0.709	0.737	-
Resource Access	0.278	-0.026	-
Knowledge Access	0.839	0.505	-
Value-added	0.666	0.39	-
Post-Guanxi	0.816	-	-
Pre-Guanxi	-0.28	-	-

*** $p \leq 001$, ** $p \leq 01$, * $p \leq 05$,

5.6 Summary of the Results

Table 5.35 provides a summary of the statistical results of both regression analyses and structural equation modelling. All but one hypothesis are supported in both sets of analyses.

Table 5.35 Summary of the results

Hypothesis	Multiple Regression analysis	Structural Equation Modelling
<i>Model on Monitoring mechanisms</i>		
H1 Formal monitoring is positively related to perceived information	Supported	Supported
H2 informal monitoring is positively related to perceived information	Supported	Supported
<i>Model on Value-added mechanisms</i>		
H3 Resource access is positively related to value-added	Not significant	Not significant
H4 Knowledge access is positively related to valued-added	Supported	Supported
<i>Model on the role of complementarities in Value-add and Monitoring</i>		
H5A Complementarities is positively related to Guanxi before signing contract	Not significant	Not significant
H5B Complementarities is positively related to Guanxi after signing contract	Supported	Supported
H6 Complementarities is positively related to formal monitoring	Supported	Supported
H7 Complementarities is positively related to informal monitoring	Supported	Supported
H8 Complementarities is positively related to resource access	Not significant	Not significant
H9 Complementarities is positively related to knowledge access	Supported	Supported
<i>Model on the Role of Guanxi as a Facilitator in knowledge access and informal monitoring</i>		
H10 Guanxi is negatively related to formal monitoring	Supported	Supported
H11 Guanxi is positively related to informal monitoring	Supported	Supported
H12 Guanxi mediates the positive relationship between complementarities and informal monitoring	Supported	Supported
H13 Informal monitoring is positively related to formal monitoring	Supported	Supported

H14 Guanxi is positively related to resource access	Not significant	Not significant
H15 Guanxi is positively related to knowledge access	Supported	Supported
H16 Guanxi mediates the positive relationship between complementarities and resource access	Not significant	Not significant
H17 Guanxi mediates the positive relationship between complementarities and knowledge access	Supported	Supported
<i>Model on Relationship between Value Added and Monitoring mechanism</i>		
H18 Value added is positively related to monitoring	Supported	Supported

CHAPTER 6

DISCUSSION AND CONCLUSIONS

6.1 Discussion of the Results

This dissertation set out to analyze the relationship between venture capital investors and their portfolio companies in a Chinese business culture setting with the objective of identifying the primary monitoring and values added mechanisms and the factors influencing those mechanisms. In order to identify these monitoring and value-added mechanisms and the factors influencing those mechanisms, earlier research on relationships between venture capital investors and their portfolio companies and Chinese business culture was reviewed. As it was recognized that there is very little earlier research focusing on this topic, the literature review was expanded to cover other related and partly analogous types of inter-organizational relationships in Western countries. Review of earlier research on the research topic and several related fields of empirical research and identification of commonalities in the literature provided a solid basis for hypothesis development.

In addition to the review of empirical research on the research topic and related fields, the most relevant theoretical approaches were reviewed. These included asymmetric information and signalling theory, resource-based view, knowledge-based view, social capital theory, resource dependence perspective, agency theory, and transaction economics. These theories were summarized, their related empirical applications reviewed, and the critiques of these theories were discussed. Finally, the Chinese business culture, Chinese institutional environment and recent research on venture capital in developing countries were also reviewed.

All these theories were compared and their applicability to the present study was assessed. An extensive review of both empirical and theoretical literature relating to the research topic gave a solid basis for hypothesis development.

Building on these reviews of earlier empirical research and relevant theoretical approaches, theoretical models were built focusing on (1) two main forms of monitoring provided by venture capital investors; (2) two main forms of value-added provided by venture capital investors; (3) the effect of complementarities; (4) the role of Guanxi; and (5) value-added influencing the effect of monitoring. Together these five sub-models comprise an integrated model of the monitoring and value-added mechanisms and the factors influencing those mechanisms in relationships between technology-based firms and their venture capital investors.

These models were validated through contemporary survey data collected from the fund managers of venture capital firms which are based in mainland China. The models were tested using factor analysis and regression analysis. These models are the first theory-based, empirically validated models that examine the relationships between Chinese venture capital firms and their portfolio companies. Finally, an integrated model consisting of all the sub-models was tested using structural equation modelling. In the following chapters, the five sub-models are discussed.

The research answers the three research questions posed in chapter 1.2 by indentifying the key monitoring and value-added mechanisms and the factors influencing those mechanisms. The mechanisms are further discussed in the next chapter in the discussion of the model on the monitoring and value-added mechanisms. The factors influencing the monitoring and value-added mechanisms

are discussed in chapters 6.1.3, 6.1.4 and 6.1.5.

Based on the model of these monitoring and value-added mechanisms and the factors influencing those mechanisms, the present study also explains how venture capital investors should select investees and how should venture capital investors manage their relationship with investees. These normative recommendations are discussed in Chapter 6 (6.3 managerial implications).

6.1.1 Model on the monitoring mechanism

The model of the monitoring mechanisms posits that venture capital firms deal with information asymmetry primarily through two main mechanisms: formal monitoring and informal monitoring. Formal monitoring refers to the contractual mechanisms such as requirements for the provision of detailed and regular information and restriction on management's actions encoded in a contract and enterprise's Articles of Association/Corporate Charter. Informal mechanisms are derived from board representation and regular meetings between the venture capitalist and the entrepreneur (Mitchell, Reid and Terry, 1995). These monitoring mechanisms were predicted to be associated with the accuracy and adequacy of perceived information.

The paths between both formal and informal monitoring and the perceived information were statistically significant. But the structural equation-modelling analysis shows the total effects from informal monitoring on perceived information is much more intensive than that from formal monitoring (.611 vs .392). It is not a surprising result. Based on the institutional theory, Feng Zeng (2004) and Bruton et al. (2004) predicted that China's relatively weaker institutional and contracting environment should have made it difficult for investor to use contractual restriction alone to solve the agency problem efficiently and

venture capital monitoring is done much more through personal interactions with the entrepreneur who founds the firm. This study has provided empirical evidence to support previous theoretical prediction. Supporting the hypotheses of Feng Zeng (2004) and Bruton et al. (2004), this study found that the formal contract restriction alone could not significantly mitigate the information asymmetry between the principal and the agent, and the improvement of accuracy and adequacy of perceived information is made mainly through informal and non-rule based monitoring approaches. The present study also found both foreign and domestic independent venture capital firms conducted significantly more informal monitoring activities on their investees than the other types of venture capital firms.

6.1.2 Model on the Value-added Mechanisms

The model of the value-added mechanisms posits that venture capital firms provide value-added to their portfolio companies primarily through two main mechanisms: resource access and knowledge access. Resource access refers to concrete resources such as distribution channels and production facilities that the portfolio company can access through its relationship with the venture capital investor. Knowledge access refers to organizational learning by the technology-based firm through its interaction with the venture capital investor and access to their knowledge base. These knowledge access mechanisms were in general shown to be associated with the value-added provision. All of the hypotheses regarding knowledge access mechanisms received support from the analyses.

While all the other hypotheses in the present study received support from the analyses, all the hypotheses related to resource access did not receive support from SEM analysis. The reason for this result is because concrete resources such as

distribution channels and production facilities can only be offered by corporate venture capital and university subsidiary venture capital which only accounted for about 20% of the total sample. 80% of the total sample venture capital firms simply did not possess these resources and had to rate the four resource access measurement items (namely, production facilities, technology, research and development and distribution channel) “totally not accessible”. As these four measurement items were not related to any other construct measurement items, all the path coefficients associated with resource access in SEM were not significant.

Overall, the development of a consistent and theoretically grounded framework is a valuable contribution for the understanding of monitoring and value-added of venture capital as a consistent theory-based framework enables the theoretical explanations when and how these mechanisms work.

6.1.3 Model on the Role of Complementarities in Monitoring and Value-added

Contributing to a deeper understanding of the monitoring and value-added mechanisms of venture capital firm, the role of complementarities in monitoring and value-added model explains the factors influencing monitoring and value added within the relationship between venture capital and their portfolio companies.

Recognizing organizations as economic actors (although embedded in social context), the economic motivation is an important factor influencing the willingness to collaborate (Amit and Zott 2001, Brandenburg and Nalebuff 1996). Complementarities were argued to be related to economic benefits and therefore create an incentive for collaboration. Supporting this hypothesis, complementarities between the venture capital investor and the portfolio company

were significantly positively related to Guanxi after signing a contract, formal monitoring and knowledge access.

Building on the asymmetric information theory (Gompers, 1995; Sahlman, 1990), this model demonstrates the role of complementarities influencing the usage of rigorous terms in a formal contract. Building on the agency theory (Gompers, 1995; Lerner, 1995), this model also demonstrates the role of complementarities enhance informal monitoring and this influence was fully mediated by Guanxi. Similarly, building on the knowledge-based view (Lane and Lubatkin 1998), the model also indicates the role of complementarities influencing knowledge access. The relationship between complementarities and knowledge access was found significant but the effect was only partially mediated by Guanxi. Finally, building on the resource-based view, this model was designed to examine the role of complementarities as an enabler of value creation through resource sharing (Rothaermel and Deeds 2001, Rothwell 1989, Rothwell and Zegweld 1982, Teece 1986). But the relationship between complementarities and resource access was not significant due to the reason mentioned in chapter 6.1.2.

6.1.4 Model on the Role of Guanxi in Monitoring and Value-added

Recognizing the problems of information asymmetry and transferring valuable complementary resources and knowledge over organizational boundaries, the model drew from social capital theory (Nahapiet and Ghoshal 1998, Tsai and Ghoshal, and Yli-Renko et al. 2001a) and demonstrated the important role of Guanxi in facilitating inter-organizational information sharing, knowledge learning and resource access.

Guanxi is widely seen as crucial to business relationship in China, where

important business interactions are rarely conducted between strangers. Guanxi, which relies on social capital drawn from personal contacts, bridges critical information gaps and engender favours based on trust or mutual benefit. Once established, it can substitute for and even override institutional or legal guarantees common in the West.

Guanxi can be vital as a source of information and as a means of monitoring or value-added. It can shape everything from deal sourcing to exit options (Ahlstrom and Bruton, 2007). In this study, Guanxi was strongly positively related to formal monitoring, informal monitoring, knowledge access and resource access in the investment relationship involving venture capital and portfolio companies. Providing support for the hypotheses, Guanxi was shown to mediate the influence of complementarities on informal monitoring and knowledge access. Finally, it was shown that foreign venture capital have closer Guanxi with their portfolio companies than domestic venture capital in deal negotiation period. After signing a contract, both foreign and domestic independent venture capital firm have similar levels of Guanxi with the investees.

6.1.5 Model on the relationship between value added and monitoring

This model builds on the earlier research on agency theory, resource-based view, knowledge-based view and inter-organizational relationship. Primarily, it seeks to explain the interaction between value-added and monitoring mechanism. The associated hypotheses in the present study received strong support from the analyses. The value added was significantly positively related to the effect of monitoring—accuracy and adequacy of perceived information. This finding has noteworthy managerial implications for venture capital firm operating in mainland China. Value added could be a powerful monitoring mechanism to relieve the

agency problem in transitional economies where the institutional and contracting environment is relatively weak. In particular, the present research demonstrated independent venture capital firms offered significantly more value-added to their portfolio companies. As a result, they perceived significantly more accurate and adequate information from their investees.

Overall, the model has extended the understanding of the factors influencing monitoring mechanism. The model integrates monitoring and value-added mechanism and predicts how various factors are influencing the accuracy and adequacy of perceived information.

6.2 Theoretical and Empirical Contributions of the Dissertation

The present study makes several theoretical and empirical contributions to the literature on venture capital in transitional economy and inter-organizational relationships in general. In the following, these contributions are briefly discussed: firstly from the perspective of venture capital research in transitional economy and secondly from the perspective of research on inter-organizational relationships in general.

6.2.1 Contributions to the Literature on Venture Capital in transitional economy

(1) *The first rigorous empirical analysis of the relationships between venture capitalists and technology-based firms in a transitional economy.* One of the key contributions of the present study relates to the observation made earlier that there has been an important research gap in the rigorous empirical research focusing on the relationships between venture capital investors and technology-based firms in

transitional economies. The few studies (Gompers and Lerner 1998, Kelley and Spinelli 2001, and Maula and Murray 2000a, 2000b) have relied on secondary data and therefore had limitations in creating a more thorough understanding of the dynamics of these relationships. Most existing research has taken place in relatively stable Western economies. It follows that inter-organizational relationship in transitional economies such as Eastern Europe, the former Soviet republics, and China may embody more useful social capital that can compensate for these countries' lack of market supporting institutions such as transparent laws and regulations (Peng and Heath, 1996). By 1) building a theoretically grounded model of the monitoring and value-added mechanisms, which incorporates the factors affecting these mechanisms in transitional economy; 2) collecting primary data from the fund managers of venture capital based in mainland China; and 3) then statistically testing the hypotheses, the present study has contributed to providing empirical support for previous theoretical venture capital research on Guanxi, monitoring and value-added in a transitional economy setting and giving a deeper understanding of the venture capital investors's relationship with their portfolio companies in a transitional economy.

(2) *Comprehensive analysis of monitoring and value-adding mechanisms and the factors influencing them.* The present study builds on the earlier research on venture capital and provides theory-based and empirically tested explanations for earlier suggestions that venture capitalists use a variety of formal and informal mechanism to mitigate agency risk (Mitchell et al., 1995; Sapienza and Korsgaard, 1996; Steier and Greenwood, 1995; Sweeting, 1991) and offer potential value-added benefits for start-up companies (Gompers and Lerner 1998, Maula and Murray 2000a). Obtaining primary data from the fund managers of venture capital based in mainland China, the present study has been able to get inside the 'black box' of how venture capital mitigates agency risk and how venture capital

adds value to portfolio companies. Employing this primary data, the present study has been able to test the roles of different monitoring and value-adding mechanisms and the factors influencing these mechanisms, especially Guanxi, thus creating an enhanced understanding of the monitoring and value-added processes in venture capital investment in a transitional economy.

6.2.2 Contributions to the Literature on Inter-organizational Relationships

In addition to contributing to the scarce literature on venture capital in transitional economies, the present study makes more general contributions to the wider body of literature on inter-organizational relationships.

(3) Multi-theoretic framework of the mechanisms of monitoring, knowledge transfer, resource sharing, and value creation in inter-organizational relationships. The study contributes to the research on inter-organizational relationships by developing a multi-theoretic framework of the monitoring and value added mechanisms in inter-organizational relationships and the factors influencing those mechanisms.

Inter-organizational relationships have been researched from many different theoretical perspectives. While focusing on one theory would help understand how that specific theory works, a multi-theoretic approach is required to understand the complex phenomena related to inter-organizational relationships (Gulati 1998, Lado et al. 1997, Osborn and Hagedoorn 1997, Park et al. 2001, Smith et al. 1995). Two of the underlying bases of the present study are the asymmetric information and resource-based view (Akerlof, 1970, Barney 1991, Penrose 1959, Peteraf 1993). This perspective predicts that resource complementarities are an important factor influencing monitoring effect and value creation in inter-organizational

alliances (Hsu, 2004, Das and Teng 2000, Hitt et al. 2000, Teece 1986). The resource-based view and resource dependence perspective predict that resource access via inter-organizational relationships is important for new ventures (Das and Teng 1998, Jarillo 1989, Park et al. 2001, Pfeffer and Salancik 1978). Knowledge-based view predicts the importance of knowledge access as one of the value creating mechanisms in inter-organizational relationships (Lane and Lubatkin 1998).

Based on the resource-based view and asymmetric information, Hsu (2004) argued that entrepreneurs are willing to accept more rigorous contract terms in order to form a partnership with venture capital firm with better reputations and resource. Similarly, the expectation of reciprocal benefits through combining complementary resources collaboratively enhances the entrepreneurs' willingness to accept more informal monitoring activities and disclose more accurate and adequate information to their venture capital investors. On the other hand, knowledge-based views are also used to recognize the problems of transferring knowledge (especially tacit knowledge) over organizational boundaries. Social capital (Guanxi in the Chinese context) has been found to be an important facilitator of resource and knowledge exchange (Nahapiet and Ghoshal 1998, Tsai and Ghoshal 1998, Yli-Renko et al. 2001a, Fried and Hisrich, 1995, Bruton 2003).

The present study has developed a multi-theoretic framework of monitoring, knowledge transferring, resource sharing, and value creation mechanisms and the factors influencing these mechanisms in inter-organizational relationships between venture capital and investees and tested it in the context of transitional economy. Despite the specific empirical context of transitional economy, the predicted relationships are likely to apply to some extent to inter-organizational relationships in other type of economies because the model has been built on the theories tested

in multiple contexts and combines them after an examination of the commonalities and differences between theories in terms of predicted relationships. The result of this work is a rather comprehensive framework explaining monitoring and value added in inter-organizational relationships, particularly in the Chinese cultural setting, but one which is also reasonably applicable to other cultural contexts involving inter-organizational relationships between venture capital and their investees.

(4) *Contributions to the literature on agency theory in inter-organizational relationships.* Contributing to the literature on the agency theory in inter-organizational relationship, the present study integrates the agency theory, asymmetric information, resource-based view, and social capital theory arguments to see how formal contract negotiation and informal monitoring activities are influenced by complementarities directly or through Guanxi, even through value added activities. From organizational economics, the present study adopted the role of expectation of reciprocal benefits influencing the investees' willingness to accept more rigorous monitoring requirements and disclose more accurate and adequate information to investor. This combination of the agency theory with other theories has been used in recent research on venture capital (Hsu, 2004). By integrating monitoring and value added mechanism model, we examined simultaneously these two mechanisms' influence on the elimination of agency risk and provided empirical support for the previous theoretical research on Chinese venture capital (Feng Zeng, 2004; Bruton et al., 2004).

(5) *Contributions to the literature on resource and knowledge access in inter-organizational relationships.* Contributing to the research on resource and knowledge access in inter-organizational relationships, the present study integrates the resource-based view which argues the importance of complementary assets for

value created in the inter-organizational relationship with other relevant perspectives. From organizational economics, the present study adopted the role of potential economic benefits influencing the motivation for collaboration. This combination of the resource-based view with other theories has been advocated in research on inter-organizational relationships (Das and Teng 2000:55).

(6) *Contributions to the literature on Guanxi (and the social capital theory in general)*. From the social capital perspective, the resource and knowledge access model adopted the idea of Guanxi as a facilitator of resource and knowledge access. In doing so, the present study contributes to the existing literature on Guanxi and inter-organizational knowledge transfer by providing further empirical validation for the recent research which suggests the importance of Guanxi in influencing business relations in China (Ahlstrom and Bruton, 2000; Jeng 2000; Liu and Zhang, 2006; Peng 2002; Peng 2005; White 2005). As an important contribution to the literature on Guanxi, the present study has also demonstrated that Guanxi is driven by the effort to mitigate agency risk as well as by the motivation to acquire potential benefits through collaboration. By arguing theoretically and demonstrating empirically the importance of complementarities as a prerequisite for the successful build-up of Guanxi and subsequent formal and informal monitoring, knowledge and resource access, the present study extends the previous understanding and applicability of Guanxi and its link to other theoretical frameworks.

(7) *Contributions to empirical testing of theories in interorganizational relationships*. Much of the recent research on the influence of interorganizational relationships on the performance of new ventures employed primarily count-measures with relatively few focusing on the characteristics of partners and relationships (DeCarolis and Deeds 1999, Deeds and Hill 1996, Rothaermel and

Deeds 2001, Shan et al. 1994, Wang et al. 2001). However, some authors have recently argued that the characteristics of the partners and relationships may be much more important than the mere numbers of partners (Stuart et al. 1999, Stuart 2000). Some recent research has suggested that focusing on dyadic level on the relationships with the most important constituencies of the new firms would help to create a better understanding of the influence of interorganizational relationships on their performance (Galunic and Moran 2000, Lane and Lubatkin 1998, Stuart 2000, Yli-Renko et al. 2001a).

Employing this strategy, the present study has been able to gather rich data from the fund managers of Chinese venture capital firms concerning relationships with their technology-based portfolio companies. The present study has extended the understanding on the role of interorganizational relationships by arguing and demonstrating the influence of this relationship on monitoring and value-added mechanisms.

6.3 Managerial Implications

The findings of the present study have several implications for venture capitalist and entrepreneurs on monitoring, value-added, eliminating agency risks and managing Guanxi. These implications are briefly discussed in the following chapters.

6.3.1 Implications for Venture Capital Investors

Investee Selection

The findings of the present study imply that complementarities between the venture capital investor and the portfolio company are a crucially important success factor and a key determinant of value creation. Given that complementarities were found to be an important structural factor influencing the

benefits available from the relationship, complementarities should always be considered by the venture capitalists when considering making investment. The existence and extent of complementarities, therefore, should be explicitly studied during the due diligence process. The success of investment is not only on the basis of the resources investee control themselves, but additionally on the basis of resources available through relationships with venture capital investors.

What complementary resources should venture capitalists look for when they consider an investment in China? One of the key success factors for many Chinese ventures is the practical knowledge and understanding of local business culture. Venture capitalists need to combine their managerial and financial knowledge with entrepreneurs' understanding of local constraints and opportunities to develop business models that work in the Chinese context.

Recent experience shows that business models from other culture setting can be successfully adapted for China, if the entrepreneurs truly understood the contextual differences. For example, TaoBao.com, the successful Chinese online-auction company, was inspired by ebay.com but modified the business model for Chinese customers. TaoBao had 70% of the Chinese auction market for the first six months of 2007, compared with eBay's 26%, according to China Internet Network Information Centre, a quasigovernmental agency. No wonder, due to the difference of local custom or peculiarity, most popular non-Chinese websites do not have official Chinese versions. That leaves plenty of room for Chinese enterprising start-ups transplant the ideas and localise them to suit Chinese tastes. But investors also have to be much more discriminating. There are over 200 YouTube like video-sharing website in China, about 10% of them backed by venture capital (The Economist, 15th-21st September 2007). Not surprisingly, most of them will go liquidation in just few years as the video-sharing market is so

saturated and competition is extreme high in China.

In China, investors are finding that success does not necessarily require breakthrough technology — it can be achieved just as well by excelling at the application of technology. Given that, an entrepreneur with good knowledge and understanding of local business culture setting can be seen as especially valuable complementarities for venture capitalists, especially for foreign venture investors.

Managing Relationships (Guanxi)

The present study identified Guanxi as a key facilitator of monitoring and valued-added mechanisms. The finding that Guanxi mediates the benefits from complementarities and greatly facilitates informal monitoring and knowledge access has implications for venture capitalists in managing their relationships with investees. This finding suggests that Guanxi is an important lever that the venture capital can use to obtain more accurate and adequate information from their relationships with investees. While it was shown that the complementarities have a significant catalyzing role for Guanxi after signing a contract, the development of close Guanxi is recommended for the venture capitalist in China, especially those who have complementary resources.

Previous research has shown that Chinese business men/women are much less reliant on contracts and institutions and place far greater emphasis on personal relationships. As such, Guanxi is a critical element of conducting business in China (Davison and Ou, 2008). This research has produced confirmatory results for Guanxi's significant effects on information transference, monitoring and value creation. The present study found that the better Guanxi between the venture capital and the entrepreneur before signing a contract, the more likely the investee to be receptive of the usage of contract covenants and to accept attached terms and conditions, which in turn use more formal warrants. Venture capitalist may want

to maintain a close Guanxi with entrepreneurial team to improve multi-understanding and ease the distrust between the two parties.

After signing a contract, the findings of the present study imply that closer Guanxi provided venture capitalists with better access to desired information and ensure its accuracy. Because the quality of information obtained through informal monitoring depends on the resources committed to this activity (Harris and Raviv, 1979). And the resources committed to monitoring depend on how well established the relationship is between the two parties. For the venture capitalist who wants to aggregate accurate information, they must develop a high level of trust between the venture capitalist and the entrepreneur, in which case the venture capitalist is seen not just as an investor but also as a trusted advisor.

Monitoring

Many researchers argued the monitoring of the firm is done much more frequently through personal interactions with the entrepreneur who founds the firm in China. This study has provided the first empirical evidence to support previous theoretical prediction. The structural equation-modelling analysis shows the total effects from informal monitoring on perceived information is much more intensive than that from formal monitoring. The difficulties involved in monitoring a firm are further magnified due to China's relatively weaker institutional and legal system as identified in Chapter 2. Venture capitalists in China are recommended to maintain appropriate vigilance to ensure that the firm is performing as desired. Venture capitalists may need to send people to a firm to count things and to double check that things are generally going smoothly, irrespective of what the accounting data is saying. Foreign venture capitalist should be cautioned against maintaining the same number of investments as in the North American or West European market because of the intensive monitoring and assistance these firms typically need.

Value-added

Beyond providing financial capital, venture investors are typically expected to add value to their investments. China is no exception. The statistical analysis in this study shows venture capital firms in China provide value-added to their portfolio companies. We also found knowledge access offered by foreign venture capital firm was significantly higher than the base group—domestic venture capital firm and corporate venture capital offered significantly more resource access to their portfolio companies among several different types of venture capital firms. However, it is a big challenge for venture capitalists to add value to their portfolio companies.

Like their western counterparts, venture investors in China add value by screening and recruiting management team members; helping companies navigate national and global markets in search of capital and customers; maintaining financial controls; and identifying ways to improve productivity and achieve lower costs. Not surprisingly, attempts to add value often lead to conflicts with entrepreneurs, who view such involvement as interference in their managerial prerogatives. Venture investors must rely heavily on their Guanxi to mediate these conflicts and delivery value-added.

Finally, the way venture capitalists provide value-added in China is different than in the West. In the US, advice provided to CEOs of funded firms is often very direct and may occur in regular interactions (Fried and Hisrich, 1995). However, in China the venture capitalist must deal appropriately with the rather formidable cognitive institution known as *minzi*—face. Its relatively greater importance in a Chinese-based culture is widely recognized (Bond, 1988). Venture capitalists can advise managers but in a manner that allows the managers to maintain their ‘face’.

Elimination of Agency Risk

For years, venture capitalists complained about the incomplete and high agency risk in transitional economies which increase the cost of premature termination of investment projects. The findings of the present study imply that both complementarities and Guanxi are the key determinant of effective elimination of agency risk. It is expected that entrepreneurs are willing to accept more rigorous formal contract terms and informal monitoring requirement in order to form a partnership with right venture capital firm and disclosure more accurate and adequate information to an investor that has good Guanxi with them.

Furthermore, this study found that value added mechanism is positively related to the effect of monitoring—accuracy and adequacy of perceived information. The standardized total effects from value added to the accuracy and adequacy of perceived information is .42 ($p < .001$) that indicates value added is a powerful monitoring mechanism to relieve the agency problem. This finding is in line with a strong social norm in Chinese society called renqing (Reciprocal favour). The rules of reciprocal favour require the recipient who has received the favour to return the favour as soon as the opportunity arises (Hwang 1987). It would be very hard for entrepreneur to refuse disclosure his information after receiving helping from venture capitalists. This finding has noteworthy managerial implications for venture capital firm in transitional economies where the institutional and contracting environment is relatively weak.

6.3.2 Implications for Entrepreneurs

The findings of the present study also have useful implications for entrepreneurs.

Investor selection

As discussed before, entrepreneurs must make conscious choices about who

provides capital and most importantly what value they can add in addition to capital. The empirical data demonstrated that there are significant differences in the value-added provided from venture capital investors. The findings of the present study imply that complementarities are a key determinant of the potential economic value creation. Therefore, entrepreneur should select venture capital investors on the basis of their ability to provide complementary support and advice in their respective areas of strength.

Role of Guanxi

The finding of the present study indicate that Guanxi are an important determinant of value-added provided by venture capital investors for their portfolio companies. This finding suggests that Guanxi is an essential tool that the entrepreneurs can use to obtain greater value-added from venture capital investors. It is up to the management to interact with the venture capital investors and reap the benefits from the association. Therefore, active relationship management is recommended for the entrepreneurs.

6.4 Limitations of the Study

There are no studies without limitations. Some of the limitations of the present study and the implications of these limitations are discussed in this section.

Cross-sectional nature of the study. Even though this study combines both survey data and secondary data collected at different times, the nature of the study is essentially cross sectional. This design limits the opportunities for claiming causalities in the identified relationships purely on the basis of empirical findings. However, the hypotheses were developed on the basis of received theories and empirical research, thus improving the validity of the results. Despite the simultaneous data collection for many of the variables, some of these variables are

such that causalities are fairly clear (such as Guanxi influencing knowledge access and not vice versa).

Focus on one side of the dyadic relationships. This study focused on the dyadic relationships between the venture capital firm and its portfolio companies. Nevertheless, the dyadic relationships were examined only from the venture capital perspective. Simultaneous research of the relationships from both the entrepreneur and corporate investor perspectives would provide additional insights, or at least additional factors to be considered. However, the practical implementation of such a study would have been difficult or impossible because of the inherent reduction in the sample size and increase in time and costs (Mohr and Spekman 1994, Yli-Renko et al. 2001a). Providing validity for the measurement from one side of the dyad, Sapienza (1992) and Sapienza and Gupta (1994) demonstrated a very high similarity in answers regarding value-added provided by venture capitalists from both venture capitalists and entrepreneurs.

Use of primarily perceptual measures. One of the limitations of this study is that it employs primarily perceptual measures. However, this strategy has been intentionally chosen in order to examine issues where objective measures are not available. The use of survey-based measures has recently been warranted (Das and Teng 2000:53). The reliability of perceptual measures in has been shown to be good in many of the studies examining analogous situations such as value-added in venture capital (Sapienza 1992, Sapienza and Gupta 1994), performance of joint ventures (Geringer and Hebert 1989, 1991, Lyles and Salk 1996), and performance in vertical supplier-customer relationships (Anderson and Narus 1990, Heide and John 1990, Mohr and Spekman 1994, Yli-Renko et al. 2001a). The use of perceptual measures in many of the studies has been based on the notion that success is determined, in part, by how well the partnership achieves the

performance expectations set by the partners (Anderson and Narus 1990, Mohr and Spekman 1994). Increasing the reliability and validity of the perceptual measures in the present study, the constructs have been operationalized using theoretically based and, in many cases, previously validated multi-item scales, and tested for inter-item reliability (Nunnally 1978), and convergence and divergence validity using confirmatory factor analysis.

Increasing the reliability and validity of the perceptual measures in the present study, the constructs have been operationalized using theoretically based and, in many cases, previously validated multi-item scales, and tested for inter-item reliability (Nunnally 1978), and convergence and divergence validity using confirmatory factor analysis.

The use of perceptual measures has also clear benefits in research examining the performance implications of certain types of interorganizational relationships. Separating performance implications resulting from specific interorganizational relationships is difficult without primary data focusing on those relationships. Use of secondary data might be problematic because performance differences in cross sectional studies are always subject to unobserved heterogeneity and selection bias. Unobserved heterogeneity refers to the potential unobserved factors influencing the performance differences between firms. Selection bias refers to the potential problem that higher potential ventures are likely to attract better partners. The use of primary data focusing on the processes occurring in specific dyads is likely to suffer less from the above-mentioned problems.

Overall, the present dissertation is the first study to develop and empirically validate a comprehensive model on the monitoring and value-added mechanisms and the factors influencing these mechanisms in the relationships between

technology-based new firms and their venture capital investors. In addition to contributing to the emerging literature on venture capital, the present study also contributes to a wider body of literature on interorganizational relationships and has implications both for researchers and practitioners regarding monitoring and value creation in interorganizational relationships.

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Appendix A
Cover Letter of Questionnaire

Centre for Advanced Studies
Canolfan Astudiaethau Pellach
Director: *Cyfarwyddwr* Professor Yr Athro P N Cooke MRTPI FRSA

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Thursday, 10 August 2006

Dear Sir or Madam

RE: PARTICIPATION IN CHINA VENTURE CAPITAL SURVEY

I hereby invite you to participate in our China's venture capital survey held by Centre for Advanced Studies (CASS), which is a specialist research unit in the area specifically devoted to the entrepreneurship, innovation and the knowledge economy. The Centre for Advanced Studies (CASS) is an academic and policy research unit in association with the School of City and Regional Planning at Cardiff University (www.cardiff.ac.uk/cplan). The School is regarded as the leading department of its kind in the UK, and has been awarded the highest accolade of a 6* rating for its research.

At CASS, we are committed to providing a better understanding of entrepreneurship, innovation and the knowledge economy. In pursuit of this goal, we are constantly carrying out research in areas related to these subjects. This year, we are carrying out a major research project about China's venture capital industry. The enclosed questionnaire asks a variety of questions about the way venture capital investment is conducted in China and we would be grateful if you could spare some of your time to tell us your opinions.

Despite the rapid growth of China's venture capital industry, very few studies have been undertaken to examine its development. The venture capital industry in China is therefore an under-researched area and we hope that this study will fill this gap and create a better understanding of Chinese venture capital. This research project has already been discussed within international conference and seminars and many prominent academics have appreciated its potential contribution to the development of China's venture capital industry and showed huge interest on our research results. This project is also one of twenty research projects funded and tracked by Gate2Growth Academic Network (G2G) which is a pan-European network of academics, researchers and scholars in the fields of entrepreneurship, innovation and finance which is funded by European Committee (EC).

Your opinions are very important to us. We would be grateful if you would respond to the enclosed questionnaire. We understand that your time is extremely precious but we do hope that by sparing half hour or so participating in this research you will be able to eventually share the fruits of our extensive research results. A detailed report of the research results and its managerial implications will be sent to each respondent and, if confidentiality permits, your co-operation will be noted within the final report.

We welcome the opportunity for all fund managers or portfolio managers in your company to participate in our survey and would encourage you to distribute copies of the questionnaire to your colleagues. We would also be grateful if you could return the questionnaire by 1st October 2006.

If you require any further information on this matter, please do not hesitate to contact Rachel McNaughton, the administrator at CASS (McNaughtonR@cf.ac.uk).

We look forward to receiving your co-operation.

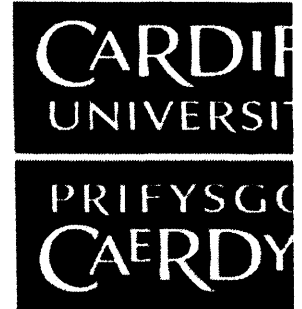
Yours sincerely



Professor Dylan Jones-Evans
Deputy Director, Centre for Advanced Studies
www.dylanje.blogspot.com

Cardiff University is the public name of the University of Wales, Cardiff, a constituent institution of the University of Wales.

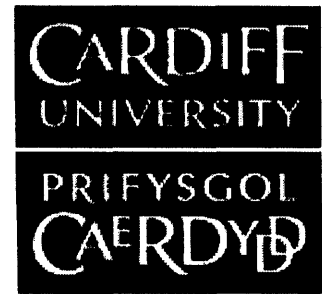
Prifysgol Caerdydd yw enw cyhoeddus Prifysgol Cymru, Caerdydd, un o sefydliadau cyfanoeddol Prifysgol Cymru.



Appendix B

Questionnaire

Centre for Advanced Studies
Cardiff University
44-45 Park Place, Cardiff
CF10 3BB
United Kingdom



Venture Capital Research Survey

Thank you for filling the questionnaire. You can fill in this questionnaire on-screen and email it back right after completion. The Email address is LIF6@CF.AC.UK. Or Please fax completed questionnaire to (44) 2920654684 (UK). You can also mail to Prof. Dylan Jones-Evans, Centre for Advanced Studies, Cardiff University, 44-45 Park Place, Cathays Park, Cardiff CF10 3BB, United Kingdom. Should you have any questions, please feel free to contact our Research Team, Mr. Feng Li or Hongjun Hou, Tel: (44) 77 2591 7920, Fax: (44) 29 2065 4684, E-mail: LIF6@CF.AC.UK.

Guidance Notes:

1. Apart from your firm's background and personal information, please answer all the questions based on High-tech VC investment in Mainland China only due to the scope of this survey.
2. For Question 5 to Question 8, if your organization is only an area representative office in Mainland China, please answer these questions based on your own office only.
3. We adopted the Venture Economics' classification of high technology firms in this survey, which includes companies operating in the following sectors: biotechnology, medical/health science, Internet specific, communications, computer software and services, computer hardware, semiconductors/other electronics and new energy.
4. Information provided here will be used to derive a series of aggregate analyses. Please rest assured that your information will be kept strictly CONFIDENTIAL & will not be disclosed individually to the public without your prior consent.

Questionnaire completed by

.....
Name

.....
Position

.....
Phone

Do you allow me to acknowledge your companies name as a source at the end of the report?

YES

NO

Do you allow me to acknowledge your name as a source at the end of the report?

YES

NO

(If I want to use quote of yours I will contact you and ask for permission, since quotes call for a direct source.)

VENTURE CAPITAL IN CHINA

IRM BACKGROUND

1. Firm name: _____

2. Type of organization:

- Independent VC
 Bank Private Equity Arm
 Securities Firm Subsidiary
 Other (Please specify) _____

3. Is the ultimate head office of your organization:

- In China
 Outside of China

4. Currently, what is the approximate total size of funds available to invest in Mainland

China by your whole firm? _____ Million US\$

5. How many senior investment executives does your firm currently employ? (Senior investment executives include presidents, chairpersons, fund managers, portfolio managers, analysts and chartered accountants) _____ Persons

6. What is the average number of business proposals your firm is currently presented with per month?

- Less than 5
 5 - 10
 10 - 20
 20 - 30
 30 and above

7. On average, what portion of the received proposals obtain financing from your firm each year? _____ %

8. Based on your firm's current situation, how important are the following sources for your firm to collect the business proposals? (Please weight the relevant source on a scale from 1 to 5, where 1 is 'Irrelevant' and 5 is 'Essential'):

	1	2	3	4	5
Entrepreneur cold calls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Referred by other venture capitalists (including syndication)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Referred by parent organizations or prior investees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Referred by friends & personal acquaintances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Referred by government organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Referred by banks or investment broker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Own activity—attendance at conventions, trade shows, conferences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Own activity—attendance at venture capital groups or associations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PERSONAL INFORMATION

9. Age: _____ 10. Gender: Male Female

11. Education level (Please tick all as apply)

- PhD
 Master
 MBA
 Bachelor
 Law
 Technology/Engineering
 Finance/Banking
 Accounting
 Other (Please specify) _____

12. Do you have other experience before joining current firm? (Please tick all as apply)

- Banking
 Stock broking
 Venture capital
 Legal service
 Accounting/Auditing
 Consulting/Strategy
 Industry
 Other (Please specify) _____

13. Number of total years experience in venture capital? _____

14. Do you have venture capital experience outside mainland China? Yes No

15. How many entrepreneurial firms are managed by you? _____

16. Investment stage preferences (Please tick all as apply)

- Seed
 Expansion / Development
 Turnaround/Restructuring
 Start-up / Early Stage
 Leveraged Buy-out/Buy in and pre IPO
 Other (Please specify) _____

17a. Industry preference:

- High Technology
 Non- High Technology
 General

17b. If you invest in high-technology industry, what is your sector preference:

Please tick all as apply)

- Biotechnology
 Internet specific
 Computer software and services
 Computer hardware
 Medical/Health science
 Communications
 Semiconductors/other electron
 New energy

18. On average, how often are you in contact with your investees before signing a contract (including all formal or informal meeting and telephone call, fax etc.)?

- Everyday
 Once every fortnight
 Once a quarter
 Three times a week
 Once a month
 Less often
 Once a week
 Once every two month

19. On average, how often do you meet your investees informally before signing a contract (including informal dinner and private party, etc.)?

- Everyday
 Once Every fortnight
 Once a quarter
 At least twice a week
 Once a month
 Less often
 Once a week
 Once every two month

20. How close do you maintain a Social Relationship with your Investee before signing a contract?

- Very close
 Keep the distance
 Fairly close
 Don't have any social relationship
 Something in the middle

21. To what extent do you know your investees' senior Manager on a Personal Level before signing a contract?

- Very well
 A little
 Fairly well
 Very little
 Something in the middle

22. On average, how often are you in contact with your investees after signing a contract (including all formal or informal meeting and telephone call, fax etc.)?

- Everyday
 Once every fortnight
 Once a quarter
 Three times a week
 Once a month
 Less often
 Once a week
 Once every two month

23. On average, how often do you meet your investees informally after signing a contract (including informal dinner and private party, etc.)?

- Everyday
 Once Every fortnight
 Once a quarter
 At least twice a week
 Once a month
 Less often
 Once a week
 Once every two month

24. How close do you maintain a Social Relationship with your Investee after signing a contract?

- Very close
 Keep the distance
 Fairly close
 Don't have any social relationship
 Something in the middle

25. To what extent do you know your investees' senior Manager on a Personal Level after signing a contract?

- Very well
 A little
 Fairly well
 Very little
 Something in the middle

SCREENING & DUE DILIGENCE

26. In general, what is your preferred average deal size? (Please tick all as apply)

- Less than US\$ 1 million
 US\$ 5 - 10 million
 Over US\$ 50 million
 US\$ 1 - 3 million
 US\$ 10 - 20 million
 No deal size preferences
 US\$ 3 - 5 million
 US\$ 20 - 50 million

27. What geographical preferences do you have? (Please tick all as apply)

- Local
 Regional
 National
 Asia
 World wide

28. In general, how many years do you expect to be involved in an investment?

- Less than 1 year
 Over 10 years
 1 - 3 years
 3 - 5 years
 5 - 7 years
 7 - 10 years

29. In general, how long do you spend on due diligence process?

- Less than 3 months
 3 - 6 months
 6 - 12 months
 Over 1 year

VALUATION

30. How important are the following sources of information in your valuation process? (Please consider the availability, accuracy and cost constraints of these information and weight the relevant source on a scale from 1 to 5, where 1 is 'Irrelevant' and 5 is 'Essential'):

	1	2	3	4	5
Business plan accounting & financial data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Own due diligence reports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information provided by entrepreneurs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government industry statistics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External statistical and information services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product/technical/marketing/sales information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accounting/consulting firms' reports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial press & Trade Journals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Curriculum vitae of management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other venture capitalists (networks or association)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

31. Please rate how often you use the following valuation methods in valuing potential investment in your firm? (Please weight the relevant method on a scale from 1 to 5, where 1 is 'Never used' and 5 is 'Always used'):

	1	2	3	4	5
Historic cost book value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Replacement cost asset value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liquidation value of assets (orderly sale)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liquidation value of assets (forced sale)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discounted future cash flows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dividend yield basis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Price/earning multiple (historic basis)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Price/earning multiple (prospective basis)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Capitalised maintainable earning (EBITDA multiple)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Capitalised maintainable earning (EBIT multiple)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recent transaction prices for acquisitions in the sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industry's special 'rule of thumb' pricing ratios	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Option value of projects (e.g. R&D)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VENTURE CAPITAL IN CHINA

32. When more than one valuation methods are used, how often are the following approaches used for determining the range of entry price? (Please tick the relevant approach on a scale from 1 to 5, where 1 is 'Never used' and 5 is 'Always used'):

	1	2	3	4	5
Place greatest weight on one particular method and use others as a check	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use the average valuation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use the lowest valuation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use the median valuation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use the highest valuation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33. Please rate how important the following factors are in your assessing the risk of an investment. (Please weight the relevant factor on a scale from 1 to 5, where 1 is 'Irrelevant' and 5 is 'Essential'):

	1	2	3	4	5
Contribution by management in terms of their managerial skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial contribution by management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nature of product market of the company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nature of the capital market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stage of financing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expected time horizon to exit from the company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expected time horizon to redemption of preference shares	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

34. There are some factors which were thought important in influencing the targeted return of an investment. How important are the following factors? (Please weight the relevant factor on a scale from 1 to 5, where 1 is 'Irrelevant' and 5 is 'Essential'):

	1	2	3	4	5
The expected length of investment in a particular proposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The actual cash amount invested in a proposal (size of proposal)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The market condition relating to a particular proposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stage of financing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The actual cash amount you seek to receive from an investment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The industrial/product sector of the investment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The geographical region of the investment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whether you have a majority of the equity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The expected gearing ratio when the finance is structured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

MONITORING & VALUE-ADDED

35. Please rate how often you use the following policy in structuring investment contracts? (Please identify below on a scale from 1 to 5, where 1 is 'never' and 5 is 'always'):

	1	2	3	4	5
Standard contract for all deals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flexible contracts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industry specific contracts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Each contract drafted by legal advisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

36. In Structuring a contract, how important are each of the following? (Please identify below on a scale from 1 to 5, where 1 is 'Irrelevant or not important at all' and 5 is 'essential'.)

	1	2	3	4	5
Relationship with investees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enforceability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Costs incurred	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Time spent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increasing value & decreasing risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liquidation preference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

37. Please rate how often you use the following financial instruments in a contracting? (Please identify below on a scale from 1 to 5, where 1 is 'never' and 5 is 'always'.)

	1	2	3	4	5
Loan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Preferred Stock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Options	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Convertible Debt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional clauses (e.g. veto rights, board membership etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

38. Please rate how often you use the following restriction in a contract? (Please identify below on a scale from 1 to 5, where 1 is 'never' and 5 is 'always'.)

	1	2	3	4	5
Restrictions on changes in ownership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restrictions on mergers & acquisition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No capital expenditure beyond certain limits without approval	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restrictions on asset disposals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restrictions on additional borrowings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restrictions on top manager's appointment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restrictions on director management's remuneration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

39. Please rate how often you use the following as the mean of monitoring investees (Please identify below on a scale from 1 to 5, where 1 is 'never' and 5 is 'always'.)

	1	2	3	4	5
Board membership at the investee company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Board membership of investee's audit committee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequency of full board meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regular meetings with entrepreneur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Audited annual accounts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Requirement of certain accounting policies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Requirement to use a particular auditing firm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Requirement for direct access to investee's accounting system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Requirement for monthly management accounts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Requirement for evaluation of monthly performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

40. To what extent is the following information you receive from the investee adequate and accurate for monitoring? (Please Weight the following information on a Scale from 1 to 5, Where 1 is 'Insufficient' and 5 is 'full/completely'):

	1	2	3	4	5
Management account	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Balance sheet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cash flow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decision-making processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing of product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strategy of business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Goodwill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training of staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

41. What is your board representation in your portfolio companies? (Please identify below on a scale from 1 to 5, where 1 is 'never' and 5 is 'always'.)

	1	2	3	4	5
Has seat on Board	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has observer seat on board	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No representation on board	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

42. To what extent, have the portfolio companies obtained these resource from your VC firm? (Please identify below on a scale from 1 to 5, where 1 is 'totally not accessible' and 5 is 'fully accessible'.)

	1	2	3	4	5
Managerial knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strategic knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accounting knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Market research on investee's products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Global competition information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local competition information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information/knowledge on customer needs & trends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Production facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research & Development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Distribution Channel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customer list	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

43. To what extent do you agree the following statements? (Please identify below on a scale from 1 to 5, where 1 is 'disagree strongly' and 5 is 'agree strongly'.)

	1	2	3	4	5
Our value-added support has been critical for our investee's success	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our value-added support is extremely valuable for our investee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our investee is very happy about our value-added support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our resource/knowledge facilitates the use of the investee's products/services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our resource/knowledge completes a solution set that the investee's customers are demanding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our resource/knowledge increases the demand for our investee's products/service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our resource/knowledge is highly complementary with the resource/knowledge of our investee's	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have superior capabilities/skills in some areas compare to our investee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

44. How strong an influence do you have over your investee companies' internal management? (Please identify below on a scale from 1 to 5, where 1 is 'no influence' and 5 is 'complete control'.)

	1	2	3	4	5
Financial reporting policies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Management Account	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decision-making processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control of staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Management recruitment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Replacing management personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing plans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

45. On average, how often do you have disagreement with the entrepreneur at following area? (Please identify below on a scale from 1 to 5, where 1 is 'never' and 5 is 'always'.)

	1	2	3	4	5
Strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Issues related to financing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research and Development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Day to day management of business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>