

**Venture Capital Institutions and Venture Capitalists'
Investment Activities: An Empirical Study on China**

Di Guo

PhD

The University of Edinburgh

2008

This thesis is dedicated to my parents, Ms. Ya-nan Fan and Mr. Zhong-qiu Guo, with love and gratitude for all they have done for me throughout my whole life.

Abstract

This thesis explores institutions under which venture capital investment operates in China and whether and how these institutions affect venture capitalists' (VCs) investment preferences, ex-ante project screening strategies, and ex-post monitoring activities in China. Based on an analysis of about 50 unstructured and semi-structured interviews and an examination of more than 800 venture capital backed deals, this study finds that regulations on corporate governance impact VCs' investment activities in China. Due to regulatory restrictions, most foreign venture capital firms are structured under limited partnerships, whereas all domestic venture capital firms (VCFs) are structured as limited companies in China. The difference in corporate governance of VCFs heavily affects VCs' investment strategies in China. VCFs under limited partnerships show more risk-taking capability than those structured as limited companies by investing more in younger projects with higher R&D intensity. Associated with the difference in investment preferences, VCFs under limited partnerships employ stage financing more frequently than those structured as limited companies do. At the same time, the stage financing strategies deployed by VCFs under limited partnerships are closely related to agency problems and transaction uncertainties. The more serious agency problems are the more intensive stage financing will be. However, VCFs structured as limited companies rarely employ stage financing and there is no visible pattern shown in their stage financing arrangements. Finally, similar to the practices in developed countries, VCs in China also take human capital factors as the utmost important criteria. However, they are more demanding in project screening by imposing additional criteria. Further, VCFs under limited partnerships are more demanding and more sensitive to market growth rate and financial returns, and more concerned about public policies. These results may be explained by the weak regulatory institutions in China and the incentives provided by different governance structures. VCFs structured as limited companies are organized hierarchically. Their incentive structure is designed to discourage risk taking and responsibilities. VCFs under limited partnership are more independent in governance that their incentive structures are designed to encourage risk taking and responsibilities.

Acknowledgements

There are many people I would like to thank for their great supports during my PhD study.

I want to give special thanks to Professor Peter Rosa and Professor Richard Harrison, my PhD thesis supervisors. They were very patient with my rough proposals and drafts and gave me valuable advice for improving this thesis. I also thank the examiners of my thesis, Dr. Sarah Copper and Dr. Geoff Gregson, for their very helpful comments and suggestions. In addition, I would like to thank Dr. John Ritchie and Professor Robert Dixon, who were my MA dissertation supervisors at Durham University. Their encouragements are important for my decision to pursue this topic for my PhD study. Moreover, many thanks to Professor Chun Chang, Professor Maozu Lu, Professor Guy Liu and all the participants to the seminars at Peking University, The University of Hong Kong, The Chinese University of Hong Kong, Hong Kong University of Science and Technology, and, The University of Macau, for their advice and comments. I also want to thank my PhD peers, researchers and supporting staffs at Edinburgh Management School and Durham Management School for their generous supports and encouragements during my PhD study.

Many thanks are due to Mr. Lihui Chen, Mr. Shaowen Su and Mr. Gavin Ni. Their kind helps are critically important for my fieldwork. Without them, I would have hardly gained the access to such a number of practitioners for my interviews. At the same time, I would like to say ‘thank-you’ to all the venture capitalists and entrepreneurs who agreed to be my interviewees though they wanted to remain anonymous. They spent precious time to talk to me and provided me valuable first-hand information. Their inputs are fundamentally important for this study. Moreover, I also thank all the following individuals: Mr. Hongcai Xu, Aimin Li, Michael Kang, Yinghong Tao, Wei Wang, Xiaojin Dong, Wei Zhang and Jenny Zeng, etc., who shared their views with me on venture capital and entrepreneurship in China.

I also owe a big thank you to my friend Mrs. Val Addison and her family, Ross, Jenney and Kate, who made me a warmest home at Edinburgh. Their

hospitality, friendship and encouragements lightened up so many struggling nights when I was away from my family.

Finally, I want to thank my family, the strongest supporters for my PhD study. My sister Yan and my brother in-law Xuehun not only provided me generous financial supports, but also gave me valuable professional advice to my research. Of course, I would put my niece, Niuniu, who was born at the beginning of my PhD study, into this list. Her angelic face not only led me the most relaxed moments after work, but also calmed me down when I faced the toughest time in my whole life. My thesis grew up with her together. Additionally, I want to show my great gratefulness to Shitong, my lifelong friend, who has encouraged me with the most sincere caring and understanding in the past years. Without his encouragements and supports, I would have hardly started my academic career. I also thank my husband, Chenggang, for his heartfelt love and intellectual sharing throughout the long thesis writing process. Most importantly, I am forever indebted to my parents for their endless patience, understanding and encouragements. Their trust and love have been the most essential for me. This thesis is dedicated to my parents.

Table of Contents

ABSTRACT	I
ACKNOWLEDGEMENTS	II
TABLE OF CONTENTS.....	IV
ABBREVIATION LIST	IX
FIGURES	X
TABLES	XI
CHAPTER 1 INTRODUCTION	- 1 -
1.1 Research Objectives	- 1 -
1.2 Research Motivations.....	- 3 -
1.3 Methodology and Data.....	- 7 -
1.4 Summary of Findings.....	- 8 -
1.5 Thesis Structure.....	- 10 -
CHAPTER 2 INSTITUTIONAL BACKGROUND OF VENTURE CAPITAL INVESTMENT	- 13 -
2.1 Introduction	- 13 -
2.2 The Nature of Venture Capital Investment.....	- 13 -
<i>2.2.1 What is Venture Capital Investment?.....</i>	<i>- 13 -</i>
<i>2.2.2 The Process of Venture Capital Investment.....</i>	<i>- 14 -</i>
<i>2.2.3 Agency Problems in Venture Capital Investment</i>	<i>- 16 -</i>
<i>2.2.4 How Venture Capital is Distinguished from Other Financial Forms?</i>	<i>- 18 -</i>
2.3 The History of Venture Capital Industry in the US.....	- 20 -
<i>2.3.1 The Emergence of Venture Capital Investment</i>	<i>- 20 -</i>
<i>2.3.2 The Professionalization of Venture Capital Investment</i>	<i>- 21 -</i>
<i>2.3.3 The Boom and Fluctuation of Venture Capital Investment.....</i>	<i>- 23 -</i>
2.4 The Significance of Venture Capital Investment.....	- 25 -
<i>2.4.1 The Globalization of Venture Capital Investment</i>	<i>- 25 -</i>
<i>2.4.2 The Impact of Venture Capital Investment on Innovation.....</i>	<i>- 26 -</i>
<i>2.4.3 General Social and Economic Impacts of Venture Capital Investment</i>	<i>- 29 -</i>
<i>2.4.4 The Heterogeneity of Venture Capital Markets around the World.....</i>	<i>- 30 -</i>
2.5 Summary	- 31 -

CHAPTER 3 AGENCY AND INSTITUTIONAL ISSUES IN VENTURE CAPITAL INVESTMENT: LITERATURE REVIEW.....	- 33 -
3.1 Introduction	- 33 -
3.2 Fundraising: Relationship between VCs and Fund Investors	- 33 -
3.2.1 <i>Limited Partnership and Agency Problems</i>	<i>- 34 -</i>
3.2.2 <i>Covenants in Venture Partnerships</i>	<i>- 35 -</i>
3.2.3 <i>Compensation Structure of the Venture Partnership</i>	<i>- 36 -</i>
3.3 Venture Capital Investing: Relationship between VCs and Entrepreneurs	- 37 -
3.3.1 <i>VCs' Decision-making Process</i>	<i>- 37 -</i>
3.3.2 <i>Ex-ante Project Screening in Venture Capital Investment</i>	<i>- 38 -</i>
3.3.3 <i>Venture Capital Contracting</i>	<i>- 40 -</i>
3.3.4 <i>VCs' Ex-post Monitoring and Value-added Activities</i>	<i>- 46 -</i>
3.3.5 <i>Syndication of the Venture Investment</i>	<i>- 51 -</i>
3.4 Institutions and Venture Capital Investment	- 54 -
3.4.1 <i>New Institutional Economics</i>	<i>- 54 -</i>
3.4.2 <i>Legal Institutions and Venture Capital Investment</i>	<i>- 58 -</i>
3.4.3 <i>Capital Market and Venture Capital Investment</i>	<i>- 59 -</i>
3.4.4 <i>Taxation and Venture Capital Investment</i>	<i>- 60 -</i>
3.4.5 <i>Social Norm/Culture and Venture Capital Investment</i>	<i>- 61 -</i>
3.5 Limitations of the Existing Studies.....	- 62 -
3.5.1 <i>Limitations of Studies on Venture Capital Investment Mechanisms</i>	<i>- 62 -</i>
3.5.2 <i>Limitations of Studies on the Effects of Venture Capital Investment</i>	<i>- 63 -</i>
3.5.3 <i>Limitations of Studies on Venture Capital Investment outside the US</i>	<i>- 64 -</i>
3.5.4 <i>Knowledge Gaps in China's Venture Capital Investment</i>	<i>- 65 -</i>
3.6 Research Question Statement	- 66 -
3.7 Summary	- 69 -
CHAPTER 4 METHODOLOGICAL JUSTIFICATION.....	- 71 -
4.1 Introduction	- 71 -
4.2 Methodologies in Social Science.....	- 71 -
4.2.1 <i>Quantitative Approach</i>	<i>- 72 -</i>
4.2.2 <i>Qualitative Approach</i>	<i>- 73 -</i>
4.2.3 <i>'Triangulation': A Combination of two Approaches</i>	<i>- 74 -</i>
4.3 Methodological Choice.....	- 75 -
4.3.1 <i>Methodological Limitations of the Existing Literature</i>	<i>- 75 -</i>
4.3.2 <i>Methodological Choice</i>	<i>- 76 -</i>
4.4 Research Design.....	- 80 -
4.4.1 <i>Research Process: A Multi-phased Design</i>	<i>- 80 -</i>
4.4.2 <i>Data Collection</i>	<i>- 82 -</i>
4.4.3 <i>Data Analysis</i>	<i>- 96 -</i>
4.4.4 <i>Validating Procedures</i>	<i>- 97 -</i>
4.4.5 <i>Structure and Time Scale of the Fieldwork</i>	<i>- 98 -</i>
4.5 Methodological Limitations and Findings.....	- 100 -
4.5.1 <i>Methodological Limitations of this Study</i>	<i>- 100 -</i>

4.5.2 Methodological Findings	- 102 -
4.6 Summary	- 104 -
CHAPTER 5 INSTITUTIONS AND DEVELOPMENT OF VENTURE CAPITAL INVESTMENT IN CHINA	- 106 -
5.1 Introduction	- 106 -
5.2 The Development of China's Venture Capital Industry.....	- 106 -
5.4.1 Emergence of the Venture Capital Industry in China: 1985-1990	- 107 -
5.4.2 The First Wave of China's Venture Capital Industry: 1990-1997	- 109 -
5.4.3 The Breakthrough of Venture Capital in China: 1998-2001	- 112 -
5.4.4 The Second Wave of China's Venture Capital Industry: 2003-present	- 114 -
5.3 Institutional Environments in China	- 124 -
5.3.1 Regulatory Institutions in China	- 124 -
5.3.2 Normative Institutions in China	- 130 -
5.3.3 Cognitive Institutions in China	- 131 -
5.4 Institutional Arrangements in China	- 133 -
5.5 Summary	- 140 -
CHAPTER 6 VENTURE CAPITALISTS' INVESTMENT PREFERENCES IN CHINA	- 142 -
6.1 Introduction	- 142 -
6.2 Distribution of Venture Capital Investment in China	- 144 -
6.3 Qualitative Findings: Factors that Impact VCs' Investment Focuses	- 147 -
6.3.1 Corporate Governance Structures of the VCFs.....	- 147 -
6.3.2 Capital Size of the VCFs	- 149 -
6.3.3 Experience and Background of the VCFs.....	- 151 -
6.3.4 Product Proprietary and Investment Stage.....	- 154 -
6.4 Data for Quantitative Analysis	- 155 -
6.4.1 Data Collection and Sampling	- 155 -
6.4.2 Variables in Quantitative Analysis	- 156 -
6.4.3 Descriptive Statistics of the Sampled Data.....	- 158 -
6.5 Findings from Quantitative Analysis.....	- 161 -
6.5.1 VCs' Investment Preferences: Development Stage and Maturity	- 161 -
6.5.2 VCs' Investment Preferences: R&D Intensity	- 166 -
6.5.3 Alternative Explanations	- 170 -
6.6 Discussions and Implications	- 172 -
CHAPTER 7 VENTURE CAPITALISTS' PROJECT SCREENING STRATEGIES IN CHINA	- 176 -
7.1 Introduction	- 176 -

7.2 Data and Methods	- 179 -
7.3 VCs' Ex-ante Screening Criteria in China: Qualitative Findings	- 181 -
7.3.1 <i>Personality and Experience of the Entrepreneur</i>	- 181 -
7.3.2 <i>Management Team</i>	- 185 -
7.3.3 <i>Products and Service</i>	- 186 -
7.3.4 <i>Characteristics of the Market</i>	- 187 -
7.3.5 <i>Geographical Factors</i>	- 188 -
7.3.6 <i>Financial Considerations</i>	- 189 -
7.4 The Weight of Screening Criteria: Findings of Semi-structured Interviews	- 190 -
7.4.1 <i>Characteristics of the Entrepreneur and Management Team</i>	- 191 -
7.4.2 <i>Characteristics of the Product and Market</i>	- 195 -
7.4.3 <i>Characteristics of Geographical Considerations</i>	- 197 -
7.4.4 <i>Financial Considerations</i>	- 199 -
7.5 Characteristics of Rejected Ventures in China	210
7.6 Factor Analysis	213
7.7 Conclusions and Implications	216
CHAPTER 8 VENTURE CAPITALISTS' EX-POST MONITORING AND STAGE FINANCING STRATEGIES IN CHINA	219
8.1 Introduction	219
8.2 Exploratory Findings on VCs' Stage Financing in China	222
8.2.1 <i>Stage Financing and Monitoring Costs</i>	222
8.2.2 <i>Major Reasons for Staging Capital Infusion in China</i>	224
8.3 Hypotheses for the Quantitative Analysis	229
8.4 Quantitative Analysis Data	234
8.4.1 <i>Data Sources</i>	234
8.4.2 <i>Definition and Measurement of Variables</i>	236
8.4.3 <i>Descriptive Statistics of the Sampled Data</i>	238
8.5 Quantitative Findings and Analysis	253
8.5.1 <i>Total Number of Financing Rounds and Financial Size</i>	253
8.5.2 <i>Duration and the Size of Investment per Financing Round in China</i>	261
8.5.3 <i>Alternative Explanations</i>	270
8.6 Conclusion and Implications	273
CHAPTER 9 CONCLUSIONS AND IMPLICATIONS	276
9.1 Summary of this Study	276
9.1.1 <i>Institutions of the Venture Capital Industry in China</i>	277
9.1.2 <i>VCs' Investment Strategies in China</i>	279
9.2 Discussions	284
9.2.1 <i>The Impact of Institutions on VCs' Investment Activities in China</i>	284
9.2.2 <i>The Impact of Agency Problems on Venture Capital Investment</i>	288
9.2.3 <i>Limitations of this Study</i>	291
9.2.4 <i>Further Research</i>	293

9.3 Implications for Policymaking and Business Practice	295
BIBLIOGRAPHY	295

Abbreviation List

ADR	-- American Depository Share
AR&D	-- American Research & Development Corporation
BVCA	-- British Venture capital Association
CCP	-- The Chinese Communist Party
CoSTIND	-- The Commission of Science and Technology and Industry for National Defence
CSRC	-- The China's Securities Regulatory Commission
DRI-WEFA	-- Data Resources Inc. and Wharton Econometric Forecasting Association
DVC	-- Domestic Venture Capitalist
DVCF	-- Domestic Venture Capital Firm
EU	-- European Union
EVCA	-- European Venture Capital Association
FIE	-- Foreign-Invested Enterprise
FVC	-- Foreign Venture Capitalist
FVCF	-- Foreign Venture Capital Firm
GERD	-- Gross Expenditure on Research and Development
HTDZ	-- High Technology Development Zones
IDG	-- International Data Group
IPO	-- Issue Public Offering
IRR	-- Internal Rate of Return
LCVCF	-- Venture Capital Firm Structured as Limited Companies
LPVCF	-- Venture Capital Firm under Limited Partnership
M&A	-- Merger and Acquisition
MoF	-- The Ministry of Finance
MoFTEC	-- The Ministry of Foreign Trade and Economic Cooperation
MoST	-- Ministry of Science & Technology
MPF	-- Multi-Factor Productivity
NPC	-- The National People Congress
NVCA	-- National Venture Capital Association
QFII	-- Qualified Foreign Institutional Investor
SAFE	-- The State Administration of Foreign Exchange
SAIC	-- The State Administration for Industry and Commerce
SBA	-- Small Business Administration
SBIC	-- Small Business Investment Company
SME	-- Small and Medium-sized Enterprise
SOE	-- State Owned Enterprise
SSTC	-- The State Science and Technology Commission
TVE	-- Township-Village Enterprise
USTR	-- The United States Trade Representative
VC	-- Venture Capitalist
VCF	-- Venture Capital Firm
WEO	-- The World Economy Outlook

Figures

FIGURE 2.1 VENTURE CAPITAL OPERATION MODEL IN THE US - 16 -
FIGURE 5.1 DISBURSEMENT OF VENTURE CAPITAL INVESTMENT IN CHINA: 1994-2005 -
107 -
FIGURE 5.2 NUMBER OF VENTURE CAPITAL FIRMS IN CHINA: 1994-2005 - 110 -
FIGURE 5.3 CAPITAL INVESTED BY DIFFERENT TYPES OF VENTURE CAPITAL FIRMS IN
CHINA: 2001-2005 **ERROR! BOOKMARK NOT DEFINED.**
FIGURE 5.4 EXIT OF VENTURE CAPITAL INVESTMENT IN CHINA: 2002-2005 - 118 -
FIGURE 5.5 SIZE OF CAPITAL MANAGED BY VENTURE CAPITAL FIRMS IN CHINA - 138 -
FIGURE 6.1 DISTRIBUTION OF VENTURE CAPITAL INVESTMENT BY STAGE IN CHINA:
2002-2005 - 145 -
FIGURE 6.2 DISTRIBUTION OF VENTURE CAPITAL INVESTMENT BY TECHNOLOGY IN
CHINA..... - 146 -

Tables

TABLE 1.1 TOTAL VENTURE CAPITAL INVESTED IN 37 NATIONS IN 2001	- 4 -
TABLE 4.1 A MULTI-PHASED RESEARCH DESIGN	- 82 -
TABLE 4.2 SAMPLES FOR INTERVIEWS WITH ENTREPRENEURS.....	- 85 -
TABLE 4.3 SAMPLES FOR INTERVIEWS WITH RESEARCHERS AND GOVERNMENT OFFICIALS	- 85 -
TABLE 4.4 SAMPLES FOR INTERVIEWS WITH VCS	- 92 -
TABLE 4.5 STRUCTURE AND TIME SCALE OF THE FIELDWORK	- 99 -
TABLE 5.1 ORGANIZATIONAL STRUCTURES OF THE 34 INTERVIEWED VCFS	- 134 -
TABLE 5.2 COMPENSATION STRUCTURE OF THE 34 INTERVIEWED VCFS	- 135 -
TABLE 5.3 THE OWNERSHIP AND COMPENSATION SCHEME OF THE 19 LPVCFS	- 135 -
TABLE 5.4 THE NUMBER OF PERFORMANCE MEASUREMENTS IN THE 34 VCFS.....	- 135 -
TABLE 5.5 VCS' MANAGEMENT OF THE PORTFOLIO COMPANIES	- 137 -
TABLE 5.6 THE BUDGET CONSTRAINTS OF THE 34 INTERVIEWED VCFS.....	- 137 -
TABLE 6.1 DISTRIBUTION OF VENTURE CAPITAL INVESTMENT BY SECTOR IN CHINA-	146
-	-
TABLE 6.2 THE SIZE OF CAPITAL MANAGED BY THE 34 VCFS.....	- 150 -
TABLE 6.3 THE INDUSTRY AND LOCAL EXPERIENCE OF THE 34 VCFS.....	- 152 -
TABLE 6.4 ORIGIN OF THE FVCFS	- 154 -
TABLE 6.5 DEMOGRAPHIC INFORMATION OF THE 86 SAMPLED VCFS	- 159 -
TABLE 6.6 DISTRIBUTION OF VENTURE CAPITAL BACKED DEALS BY DEVELOPMENT STAGE.....	- 160 -
TABLE 6.7 DISTRIBUTION OF VENTURE CAPITAL BACKED DEALS BY INDUSTRY & TECHNOLOGY.....	- 161 -
TABLE 6.8 REGRESSIONS FOR VCS' INVESTMENT PREFERENCES IN DEVELOPMENT STAGE AND MATURITY	- 165 -
TABLE 6.9 REGRESSIONS FOR VCS' INVESTMENT PREFERENCES IN R&D INTENSITY-	168 -
TABLE 7.1 SCREENING CRITERIA EMPLOYED BY VCS IN CHINA AND THE US	202
TABLE 7.2 SCREENING CRITERIA SEEN AS IMPORTANT BY VCS IN CHINA, US, SINGAPORE, EUROPE AND ASIA-PACIFIC COUNTRIES	205
TABLE 7.3 PROJECT SCREENING CRITERIA USED BY DIFFERENT TYPES OF VCFS IN CHINA	207
TABLE 7.4 TEN SCREENING CRITERIA MOST FREQUENTLY RATED BY VCS IN CHINA ...	211
TABLE 7.5 VCS' REQUIREMENTS ON VENTURE TEAM COMPOSITION OF IN CHINA	211
TABLE 7.6 TEN CRITERIA FREQUENTLY RATED AS ESSENTIAL BY LPVCFS IN CHINA..	213
TABLE 7.7 TEN CRITERIA FREQUENTLY RATED AS ESSENTIAL BY LCVCFS IN CHINA .	213
TABLE 7.8 FACTOR ANALYSIS OF VCS' PROJECT SCREENING CRITERIA IN CHINA.....	216
TABLE 8.1 CHOICE OF STAGE FINANCING BY THE 34 VCFS IN CHINA	222
TABLE 8.2 VCS' MANAGEMENT OF THE PORTFOLIO COMPANIES	224
TABLE 8.3 THE AVERAGE RATIO OF COMPANIES THAT CAN ACHIEVE THE MILESTONES	226
TABLE 8.4 VCS' SOLUTIONS WHEN THE MILESTONES ARE NOT ACHIEVED	227
TABLE 8.5 TIME SERIES OF THE SAMPLE	240
TABLE 8.6 DISTRIBUTION OF VENTURE CAPITAL BACKED DEALS BY INDUSTRY AND STAGE (UNIT: %)	243
TABLE 8.7 OUTCOMES OF THE 436 COMPANIES BACKED BY VC INVESTMENT	246
TABLE 8.8 THE NUMBER OF FINANCING ROUNDS FOR THE SAMPLED 436 COMPANIES .	249
TABLE 8.9 AGE OF THE COMPANIES AT THE FIRST ROUND OF VENTURE FINANCING ...	250
TABLE 8.10 TOTAL INVESTMENT RECEIVED BY THE SAMPLED 436 COMPANIES	251
TABLE 8.11 INDUSTRY, OUTCOMES AND INVESTORS OF THE 436 COMPANIES.....	252

TABLE 8.12 REGRESSIONS FOR THE NUMBER OF FINANCING ROUNDS AND TOTAL INVESTMENT OF THE VENTURE CAPITAL BACKED COMPANIES.....	257
TABLE 8.13 REGRESSIONS FOR THE NUMBER OF FINANCING ROUNDS AND TOTAL INVESTMENT FOR COMPANIES BACKED BY LPVCFS.....	259
TABLE 8.14 REGRESSIONS FOR THE NUMBER OF FINANCING ROUNDS AND TOTAL INVESTMENT FOR COMPANIES BACKED BY LCVCFS.....	260
TABLE 8.15 THE DURATION AND INVESTMENT SIZE PER FINANCING ROUNDS.....	262
TABLE 8.16 REGRESSIONS FOR THE DURATION AND INVESTMENT SIZE PER ROUND.....	266
TABLE 8.17 REGRESSIONS FOR THE INVESTMENT SIZE PER ROUND FOR COMPANIES BACKED BY LPVCFS.....	268
TABLE 8.18 REGRESSIONS FOR INVESTMENT SIZE PER ROUND FOR COMPANIES BACKED BY LCVCFS.....	269
TABLE 8.19 STAGE FINANCING ACTIVITIES OF FOREIGN LPVCFS, FOREIGN LCVCFS AND DVCFS.....	271
TABLE 8.20 MANAGEMENT OF PORTFOLIOS OF FOREIGN LPVCFS, FOREIGN LCVCFS AND DVCFS.....	271

Chapter 1 Introduction

‘If I am not able to catch up with a VC folk in Menlo Park, then I may expect to meet him up either on the board flying to China or at a dinner table there...’

(Partner of VCF13, interview, 2005)

1.1 Research Objectives

This study explores institutions of venture capital investment and the impacts of these institutions on venture capitalists’ (VCs) investment strategies in China. The overall institutional environments and institutional arrangements related to venture capital investment are first discussed. This study then examines whether these institutions affect VCs’ investment strategies in China; and, if the answer is yes, how these institutions impact VCs’ investment in China. The impacts of institutions on VCs’ investment activities are examined through three aspects: i.e. VCs’ investment preferences in terms of the technology and development stage of their portfolio companies, VCs’ ex-ante project screening criteria and VCs’ stage financing strategies.

The general institutional environments and arrangements related to venture capital investment in China are first explored based on secondary document analysis and interviews with practitioners and governmental officials. It explores the overall legal and financial systems, public policies and social norms under which venture capital investment operates on the one hand, and, the governance structures of the individual venture capital funds on the other hand. A detailed introduction on the trajectory of China’s venture capital industry in the past twenty years is then followed to present how institutions interact with the development of venture capital investment in China. Based on these discussions, the specific research questions on VCs’ investment strategies are clarified.

The impacts of institutions on VCs’ investment preferences in terms of technological intensity and development stage of their portfolio companies are examined from interviews with practitioners and investment data of the venture capital firms (VCFs). This analysis reveals to what extent VCs support young R&D entrepreneurship activities under the unique institutions in China. Although

researchers have claimed that venture capital investment indeed supports young R&D-oriented companies in the US (Elango et al., 1995; Gompers and Lerner, 1999a), some empirical studies show that venture capitalists tend to invest in later-staged companies in other countries (Jeng and Wells, 2000; Mayer et al., 2005). This analysis thus extends the literature by examining the impact of whether and how institutions affect VCs' capability in supporting young and R&D intensive activities in China.

The impacts of institutions on VCs' ex-ante project screening criteria in China are also evaluated. Newly-established high-technology companies are associated with serious agency problems and uncertainties due to information asymmetries and high rate of failure (Hall, 2002). As a result, it is difficult for external investors to determine the potential and likelihood of success. The existing literature suggests that VCs employ sophisticated screening criteria as a major mechanism to avoid investing in bad projects. Empirical studies have found that the screening criteria used by venture capitalists across countries do not vary much. The personality and experience of the entrepreneur and management team are the utmost important concerns of VCs in most countries (MacMillan et al., 1985; Knight, 1994). Interviews with venture capitalists are conducted to determine whether and how institutions impact VCs' screening criteria in China. By comparing VCs' ex-ante project screening criteria in China to those in the US and other western countries, it examines whether VCs are more demanding in project screening under the weaker institutions in China. In addition, it also compares the screening criteria employed by VCFs under different governance structures within China to examine the impacts of institutional arrangements on VCs' project screening activities.

Finally, the impacts of institutions on VCs' stage financing strategies in China are investigated. Stage financing is considered as the most effective way to reduce agency costs and uncertainties in venture financing (Sahlman, 1990). Empirical studies show that VCs' stage financing arrangements are indeed associated with the severity of agency problems and uncertainties of the investment; they are also correlated with the investment performance in the US (Gompers, 1995; Kaplan and Per Stromberg, 2004). Based on interviews with venture capitalists and systematic analysis on investment data of venture capital backed companies, the

pattern of stage financing arrangements in China are identified and compared to those in the US to analyze whether and how institutions affect VCs' stage financing strategies in China.

By addressing the above questions, this study provides an empirical exploration and analysis on institutions of venture capital investment and VCs' investment strategies in China, examining the impacts of institutions on VCs' investment preferences, ex-ante project screening and stage financing strategies. It is among the first empirical studies exploring venture capital investment in China based on first-hand collected data. It is also among the first attempts examining the interaction between institutions and investment activities in developing countries.

1.2 Research Motivations

Venture capital has been recognized as a powerful financial instrument to fill the funding gaps faced by young R&D-oriented companies and consequently accelerate national innovation. As an innovative financing means it has been duplicated around the world in recent years. However, despite the intense interest, little research has been conducted on venture capital outside the United States. Many areas remain unexplored, such as how venture capital operates in other countries, whether the American model works in other countries, and what the determinants for venture capital development are. This lack of knowledge not only limits our understanding in the mechanisms of venture capital from the scholarly strand but also constrains the decision-making of policymakers and practitioners. This study tries to bridge up the knowledge gap with an insightful examination on venture capital investment in China.

China's venture capital industry is of special interest for the following reasons. China is one of the largest and most vibrant venture capital markets in the world. Since 2001, China (including Hong Kong) has ranked as the second largest venture capital market next to the United States in terms of annual disbursement (see Table 1.1). Even though the size of venture capital investment is still small relative to the GDP, it has been a major source of funding for new technology-based firms. Many of the most successful new technological companies in China, such as SOHU, SINA, BAIDU, SHANGDE and SHENGDA, have been backed by venture capital

funds. At the same time, China has become one of the most favourite destinations of international venture capital funds.

Table 1.1 Total Venture Capital Invested in 37 Nations in 2001¹

COUNTRY / REGION	VENTURE CAPITAL INVESTED (USD MIL)	% OF GDP	COUNTRY / REGION	VENTURE CAPITAL INVESTED (USD MIL)	% OF GDP
Australia	1,273	0.36	Korea	1695	0.40
Austria	47	0.02	Malaysia	80	0.09
Belgium	112	0.05	Netherlands	208	0.05
Canada	3172	0.45	New Zealand	46	0.09
China	1590	0.14	Norway	74	0.05
Czech Republic	8	0.01	Philippines	24	0.03
Denmark	172	0.11	Poland	28	0.02
Finland	159	0.13	Portugal	18	0.02
France	635	0.05	Singapore	1052	1.19
Germany	1306	0.07	Slovakia	3	0.02
Greece	36	0.03	Spain	125	0.02
Hong Kong	1864	1.15	Sweden	270	0.13
Hungary	18	0.04	Switzerland	85	0.03
Iceland	7	0.09	Taiwan	393	0.14
India	1133	0.24	Thailand	22	0.02
Indonesia	9	0.01	United Kingdom	1051	0.07
Ireland	43	0.04	United States	41005	0.40
Italy	330	0.03	Vietnam	3	0.01
Japan	2148	0.05			

¹ The data on venture capital investment in this table is from Gompers & Lerner (2004, P.18). According to them, they utilized the Asian Venture Capital Journal's 2003 Guide to Venture Capital in Asia, 14th edition (2003) for statistics on the Asian region, Venture Economics' National Venture Capital Association Yearbook (2000) for U.S. information, and the European Private Equity and Venture Capital Association's Annual Survey of Pan-European Private Equity and Activity (2002) for European data. European statistics include seed and start-up investments and exclude expansion, replacement capital and buyout investments. However, Asian statistics may include expansion and buyout investments. All Dollar figures are in millions of 2002 Dollars. The figures on venture capital investment as a percentage of GDP is based on GDP figures in 'The World Economic Outlook (WEO) Database April 2002' published by IMF, 2002. These values are based upon GDP in national currency and the exchange rate projections provided by the country desk economists for developing and transition countries. Exchanges rates for advanced economies are set as one part of the WEO assumptions during the WEO exercise.

According to a Zero2IPO survey,² venture capital investments made by foreign and joint venture capital investment firms consisted of over 75 per cent of the total investment in the country in 2004. In 2005, over US \$4 billion new funds were raised from all over the world with the focus on China's market. The rapid growth of China's venture capital industry has attracted little scrutiny.

China is the largest developing economy, sustaining an annual growth rate of over 9.5 per cent since the late 1970s, when the country started economic reform. Among the achievements of the economic reform, the development of high-technology industries and non-state owned small and medium sized enterprises (SMEs) is most remarkable. After twenty years of implementing market-driven reforms to modernize the science and technology system, China's gross expenditure on research and development (GERD) rose from RMB 34.9 billion in 1995 to RMB 236.7 billion in 2005 with an average annual growth rate at about 21 per cent. Currently, China's GERD ranks the third in the world behind the United States and Japan. The output of R&D activities has also significantly improved over the years. The production of the high-technology industry accounted for about 18 per cent of the total GDP in 2004. Furthermore, the exports of high-technology products reached to US \$218.25 billion in 2005, from US \$2.87 billion in 1991.

At the same time, non-state owned enterprises show increasing contribution to R&D and high-technology industry development. Foreign and joint ventures in 53 high technology development zones (HTDZs) contributed to nearly half of the total production and 85 per cent of the total exports in 2005. Private firms, among which 99 per cent are SMEs, create 65 per cent of patents and 80 per cent of new products in China. In 2005, more than 30,000 of 41,990 companies in HTDZs were private companies that created about 3 million jobs. Although the development of China's economy and high-technology industry have attracted enormous attention from policy makers and practitioners, academic investigations remain scarce, especially studies concerning China's entrepreneurship and R&D financing.

China is one of the most active nations in initiating venture capital investment programs and attracting venture capital inflows. Over the past two decades, various

² Zero2IPO is the largest venture capital and private equity survey company in China. They have produced annual reports on venture capital investment in China every year since 2001 based on survey data. The data from the report has been quoted in many media and academic work. It is regarded as one of the most reliable data sources in venture capital investment in China.

initiatives have been carried out in order to encourage R&D activities in general and corporate R&D-oriented projects in newly established high-technology companies in particular. Venture capital investment was introduced by the government as a part of science and technology reform. China's venture capital industry echoes the dramatic institutional dynamics of the country during the transition from central planning to a more market-based business system. A thorough investigation may therefore not only contribute to understanding in venture capital investment in China as well as institutional reform. Additionally, a systematic examination of the market will also help to assess how the government initiatives work.

The rapid development of venture capital in China, like many other phenomena in the country, contradicts some theoretical predictions and empirical evidence from other countries. Researchers suggest that the differences in institutions, especially the divergence in financial and legal systems, are the major factors that impact corporate performance and business behaviours across countries (La Porta, et al., 1997, 1998; Allen and Gale, 1999; Rajan and Zingales, 2003). Cross-country studies indeed show that venture capitalists' investment activities depend on the institutions of the countries where they operate. Stronger institutions lead to more active venture capitalists' involvement in the management of their portfolio companies, greater use of innovative governance mechanisms, and more developed venture capital markets (Kaplan et al., 2003; Cummings et al., 2003; Jeng and Wells, 2000). As the largest transitional economy, China is unique in its political, economic, technological and social institutions. In particular, it is well documented that Chinese financial and legal institutions are weak (Allen et al., 2005). Thus, it is puzzling that the venture capital market in China has experienced surprisingly rapid development in the past decade. An insightful examination of the market is thus needed as the first step to uncover the puzzle.

As one of the first studies on venture capital investment in China, this study empirically explores and examines venture capital investment in China under an institutional framework. It contributes to the existing literature by providing both insights and systematic analysis on China's venture capital investment. It also contributes to the existing literature on venture capital investment by examining the impacts of both the agency relationship between VCs and entrepreneurs and the

agency relationship between VCs and the venture fund investors on VCs' investment activities. Furthermore, it contributes to the literature on institutions with the attempt to identify the specific institutions that might affect VCs' investment activities. By providing the stylized facts and a thorough analysis on VCs' investing behaviours, this study also has important implications to policy-making and decision-making of practitioners.

1.3 Methodology and Data

This study is an empirical exploration on venture capital investment in China that combines both qualitative and quantitative approaches. The choice of methodology is mainly determined by the nature of this research and the pragmatic considerations. A multi-phased research design which covers different data collecting and analyzing methods was constructed. In the initial stage, unstructured interviews, semi-structured interviews, and archive analysis were used to document and document the relevant institutions and explore the activities of venture capitalists in China. The specific research questions for quantitative examinations were then derived from the understandings in the existing literature and the interview findings. In the second stage, quantitative analyses were conducted based on the detailed investment data that were hand-collected from various sources, and, data from commercial databases. In the last stage, unstructured interviews were conducted again to reinforce the primary findings and enrich the interpretation of the findings.

The qualitative data were gathered from unstructured interviews with seven venture capitalists, four entrepreneurs, two government officials, and four researchers; the semi-structured interviews were conducted with 37 venture capitalists from 34 venture capital firms. The major quantitative data were composed of two sub-datasets: the 'Venture Economics' database and a hand collected database gathered from secondary document analysis and semi-structured interviews. The data cover detailed investment information for 1030 venture capital backed deals, which represent over one third of the venture capital backed projects in China.

This is among the first studies that combine both qualitative and quantitative analyses on venture capital investment. Limitations of the research methodology, such as sampling bias and the weakness of research skills, are hardly avoided.

However, it is hoped that the multi-phased research design and the employment of various research approaches may essentially improve the robustness of this study.

1.4 Summary of Findings

The findings of this study are summarized as follows. Overall, the institutions in China are different from those in the US and other western countries. And, institutions indeed impact venture capitalists' investment activities in China. This study shows that VCs' investment strategies share both commonalities and differences with the practices in the United States. Similar to their US peers, venture capitalists in China also take agency problems and uncertainties as important concerns in their investment. However, the unique institutions in China, especially regulatory institutions, affect venture capitalists' investment strategies. Moreover, the major institutions that affect investment activities are not along the lines of financial systems or the protection for property rights; rather, this study shows that institutions affect investment strategies mainly through the channel of corporate governance.

Primarily, this study reveals that the general institutional environments, especially legal and financial institutions under which venture capital investment operates in China are relatively weaker than those in the US. Associated with these regulatory constraints, venture capital firms in China are divided into two major groups. That is, the organizational structures of most venture capital firms in China are either limited partnerships or limited companies. The Chinese law prohibited limited partnership as a form of organizations until June 2007. Currently, nearly all foreign venture capital firms (FVCFs) are incorporated offshore under the limited partnership structure, whereas all domestic venture capital firms (DVCFs) are structured as limited companies. This difference in the corporate governance of VCFs significantly affects VCs' investment strategies in China.

First, similar to their counterparts in the US, venture capitalists in China support young R&D-oriented companies. Over 70 per cent of venture capital backed deals in the sample are in high-technology industry; about 35 per cent were in early development stages at the time of venture financing. However, VCFs under different governance structures show different risk-taking capabilities in their investments in China. Compared with the VCFs structured as limited companies (LCVCFs), VCFs

under limited partnership (LPVCFs) take higher level of risks by investing more in younger projects and projects with higher R&D intensity.

Second, venture capitalists in China also share many commonalities with their peers in developed countries in terms of the ex-ante project screening criteria. Similar to the US practice, venture capitalists in China consider the characteristics of the entrepreneur as the utmost important factor in their project screening. In addition, the market and financial considerations are also emphasized by venture capitalists in China, as that in the US. However, venture capitalists in China are more demanding than their peers in developed countries, imposing more screening criteria as additional conditions to reduce the problems raised from the weak regulatory institutions. For example, besides the commonly recognized screening factors, venture capitalists in China emphasize the integrity and social network of the entrepreneur. Additionally, venture capitalists in China consider the public policies of local governments as major concerns. Moreover, again, the screening criteria are also associated with the corporate governance structure: VCFs under limited partnership are more demanding than VCFs structured as limited companies, paying more attention to the market growth rate and the financial returns of the potential portfolio companies, and are more concerned about regulatory institutions.

Thirdly, similar to practice in the United States, for sectors where agency problems are more severe, stage financing is used more frequently in China. However, this pattern is not shown with all VCFs in China. VCFs under the different governance structures behave differently in stage financing. VCFs under limited partnership employ stage financing much more frequently and show clear regularities in their stage financing arrangements. The stage financing strategy deployed by VCFs under limited partnership in China is closely related to agency problems and transaction uncertainties. The more serious the agency problems one expects, the more intensive stage financing is used. Financing durations between stages are negatively and significantly correlated with the R&D intensity but positively and significantly correlated with the age of the company. At the same time, the investment performance of VCFs under limited partnership is positively and significantly correlated to stage financing arrangements. All the discovered stage financing strategies of VCFs under limited partnership are similar to the US practice

documented in the literature. However, VCFs under the limited company structure rarely employ stage financing. Moreover, they do not show visible patterns in the choice and structure of stage financing in their investment.

These findings suggest that institutions indeed matter in venture capital investment in China. On the one hand, the regulatory institutions impact on the corporate governance structure of VCFs in China that in turn affects the operation of the venture capital firms and incentives provided to the investment professionals. The different incentive schemes then determine the investment strategies carried by the investment professionals. VCFs structured as limited companies are organized hierarchically that provide lower-powered incentives to venture capitalists to take more risks and responsibilities in their investment. VCFs under limited partnership are more decentralized in governance that provide higher-powered incentives to investment professionals to pursue higher risks and responsibilities for more opportunities and higher return.

1.5 Thesis Structure

The structure of this thesis is organized as follows. Chapter 2 introduces the background for this study and the motivations for the research questions. It analyzes the difficulties in R&D financing followed by a discussion on why venture capital investment, as a solution for financing R&D projects, is significant to innovation and economic growth. The major characteristics and the history of venture capital investment are then introduced. Based on the discussion on venture capital investment and the evolution of venture capital industry in the United States, this chapter justifies why agency problems and institutions are the key issues in this study.

Chapter 3 reviews relevant studies with the focus on agency problems and institutional issues in venture capital investment. Studies on how the business actors resolve the agency problems and uncertainty involved in the double-sided agency relationships (i.e. the agency relationship between venture capitalists and the ultimate investors of venture funds, and, the agency relationship between venture capitalists and entrepreneurs) in venture capital investment is discussed. It also reviews the previous studies that address the interactions between venture capital investment and

institutions. This chapter concludes with a summary of the limitations with the existing literature and what knowledge gaps this study may fill up in particular.

Chapter 4 justifies the methodology and research design of this study. It first analyzes the features of different research approaches and then presents a detailed design that covers the research process, methods of data collection, the choice and access of research subjects, and data analysis methods. In the last section, the major limitations of the methods used are addressed and the methodological findings are analyzed.

Chapter 5 introduces the institutional environments and arrangements of venture capital investment in China. With an introduction on the major arguments in new institutional economics, it suggests that new institutional economics provides an appropriate platform to understand and explain venture capital investment in China. It then introduces the development of venture capital industry and the institutional settings and arrangements under which the industry has been developed. Finally, it discusses how the framework of new institutional economics may be applied to help in achieving the research objectives of this study.

Chapters 6 through 8 present the major findings of this empirically study. Chapter 6 examines venture capitalists' investment preferences in the development stage and technological intensity of their portfolio companies. By answering this question, it reveals whether venture capitalists indeed support young high-technology companies in China; whether venture capital firms are different in their capabilities to finance young R&D-oriented companies; and, what the major factors are that impact on venture capitalists' investment preferences. Chapter 7 explores how venture capitalists make ex-ante investment decisions in China with the focus on venture capitalists' project screening criteria. With this analysis, it finds out what the major risks and opportunities are considered as the most important by venture capitalists in their investment in China. Chapter 8 explores and examines venture capitalists' ex-post monitoring activities in China with a focus on stage financing. The relationship between venture capitalists' stage financing arrangements and the agency problems and uncertainties associated with the investment is investigated. In addition, the impact of the agency relationship between venture capitalists and the ultimate fund investors on VCs' stage financing strategies is also examined.

Furthermore, the impact of stage financing on the performance of venture capitalists' portfolio companies is tested. By comparing venture capitalists' investing activities in China and their counterparts in the US, where venture capital investment originated, these chapters discuss how institutions impact on venture capital investment in China.

Chapter 9 draws together the key findings of this empirical analysis and assesses the limitations with this study, followed by a discussion on the potential further research directions and the implications of this study.

Chapter 2 Institutional Background of Venture Capital Investment

2.1 Introduction

This chapter introduces the institutional background and conceptual framework of venture capital investment. Questions like what venture capital is, how venture capital is different from other financial means and what makes venture capital investment significant for economy are discussed. At the same time, the interaction between venture capital investment and institutional environments is analyzed based on the introduction of the history of venture capital investment in the United States.

This chapter is organized as follows: the next section introduces the nature of venture capital investment; Section 3 describes the history of venture capital industry in the US; Section 4 discusses the economic and social impacts on venture capital investment with the focus on its effects on innovation; The last section summarizes the chapter by addressing the importance of agency problems and institutions for understanding venture capital investment.

2.2 The Nature of Venture Capital Investment

2.2.1 What is Venture Capital Investment?

Venture capital was first used as a term by Jean Witter in his presidential address to the 1939 Investment Bankers Association of American Convention. However, for Witter, venture capital was not a specialized area of finance like modern concept that focuses on early-staged technological enterprises; rather, it was a traditional component of some wealthy individual's portfolios, i.e. investment in businesses in experimental stages (Reiner, 1991). In the past sixty years, venture capital industry has experienced dramatic dynamics and it has been well established and professionalized. The definition for this special investment form is more standardized.

According to the definition of the US National Venture Capital Association (NVCA), venture capital is 'money provided by professionals who invest alongside management in young, rapidly growing companies that have the potential to develop into significant economic contributors. Venture capital is an important source of

equity for start-up companies'³. Although private equity and venture capital are combined both statistically and in the mind of policy-makers for much of the world, the definitions for venture capital investment share many commonalities with the 'American model'(Kenney et al., 2004). For example, according to the European Venture Capital Association (EVCA), venture capital is 'Professional equity co-invested with the entrepreneur to fund an early stage (seed and start-up) or expansion venture. Offsetting the high risk the investor takes is the expectation of higher than average return on the investment'⁴.

Normally, three major groups of stakeholders are involved in venture capital investment, i.e. the ultimate investors of venture capital funds, venture capitalists and the entrepreneurs. The ultimate investors of venture capital funds are normally private or public pension funds, endowment funds, foundations, corporations, wealthy individuals and foreign investors etc. (Gompers and Lerner, 1999). In the context of venture capital investment, an entrepreneur is normally a person who operates a venture, which is normally with limited operating history and cannot raise funds from a bank or public capital market. In this case, the entrepreneur normally gives up certain portion of equity and control rights to gain the capital from venture capitalists to support the growth of the venture (Gompers. 1995).

A venture capitalist is a professional who channels the ultimate investors of venture funds and entrepreneurs with their expertise. They raise funds from those ultimate investors and then invest the capital on behalf of the investors in newly established ventures. According to NVCA, VCs not only make many efforts to seek and evaluate the projects and provide capital to the ventures; but also very actively participate in the management of their portfolio companies. It is suggested that as shareholders, VCs normally take part in all the important decision-makings in the ventures including the recruitment of major executive managers, the development of new products and services, large investment, M&A or IPO schedule etc.

2.2.2 The Process of Venture Capital Investment

The process of venture capital investment includes fund raising, capital investing, and, investment exit (see Figure 2.1). Fundraising is the first step for

³ See www.nvca.org

⁴ See www.evca.com

venture capital investment. VCs normally raise funds from institutional investors, large corporations, wealthy individuals and foreign investors who look for investing part of their portfolios in opportunities with higher risks and commensurate opportunities for higher returns. Since the 1980s, over 80 per cent venture capital firms are structured as limited partnerships in the United States with the venture capitalists serving as general partners and the investors as limited partners. In a limited partnership, investors are limited partners who contribute the majority of the capital (normally 97-99%) and venture capitalists are general partners who contribute the minority of capital. The life span of the partnership is normally between seven to ten years. Most venture capital firms are responsible for managing several pools of capital, each representing a legally separate limited partnership. The relationship between fund investors and VCs is governed by a partnership agreement that spells out the rights and obligations of each group (Sahlman, 1990).

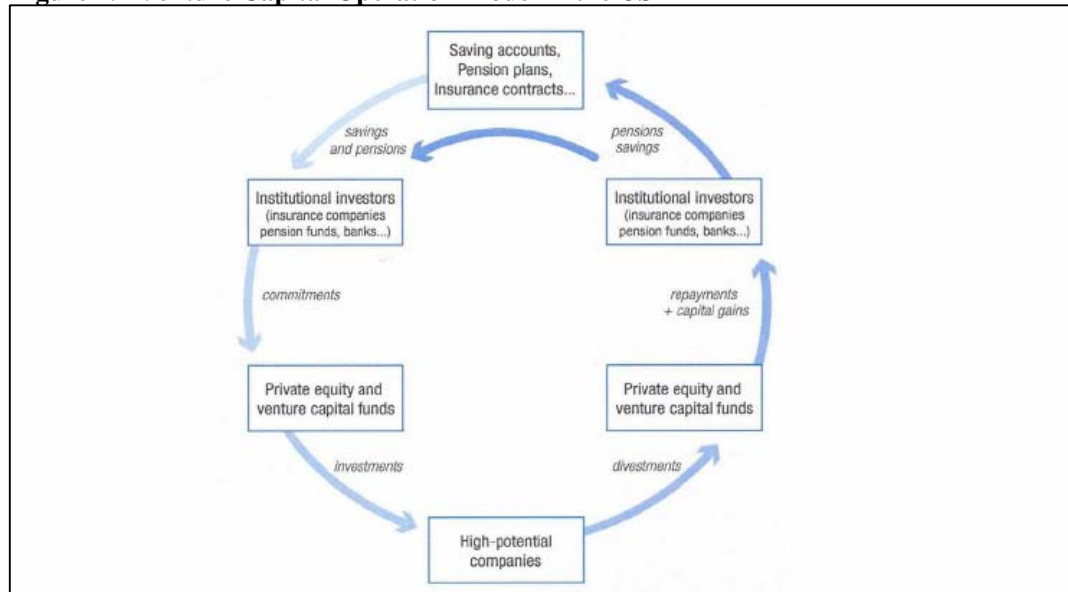
After fundraising, venture capitalists concentrate on investing the capital in growing ventures. Normally, the capital is invested in new ventures during the first three to five years of the fund. Deal sourcing, ex-ante project screening, due diligence, contract design and ex-post monitoring are the major activities of venture capitalists in venture financing (Tyebjee and Bruno, 1984). Studies show that venture capitalists not only provide the needed capital to entrepreneurs but also very actively participate in the management and governance of the ventures they invested (Sahlman, 1990; Lerner, 1994; Gompers, 1995; Kaplan and Per Stromberg, 2003). Researchers suggest that venture capitalists differentiate themselves from other institutional financiers by exerting intensive monitoring efforts and providing value-added supports to their portfolio companies (Gompers and Lerner, 1999).

The goal for venture capitalists is to begin divesting after the investments are made, i.e. converting the existing investments to cash. According to NVCA, VCs eventually seek to exit the investment in three to seven years. The major exit methods are IPO, M&A, share sale and clearance. IPO is considered as the most favourite type of exit by both venture capitalists and entrepreneurs. There have been over 3000 venture capital backed companies issued IPO at the US stock markets in the past twenty years that has brought great profits to entrepreneurs, venture

capitalists and their investors (NVCA). Normally, the distributions are made to the partners rather than reinvested in new ventures.

Typically, well before all of the capital from a venture-capital pool is distributed to the partners, a new fund is raised and invested in new ventures (Sahlman, 1990). The value of a venture capital fund is measured by the valuation of the portfolio companies in which the fund invests. Generally, by the end of the fund's life, the average internal return rate is calculated subject to a liquidity discount in the portfolio valuation. Consequently, the performance of a venture capital institution is guided by the valuation of funds it manages. Normally, the size of further fundraising and the terms of the covenant are dependent on the performance of the venture capital firm (Gompers and Lerner, 1999).

Figure 2.1 Venture Capital Operation Model in the US



2.2.3 Agency Problems in Venture Capital Investment

From the foregoing introduction on venture capital investment, it can be seen that venture capital investment is associated with serious agency problems due to the severe information asymmetry problems and high level of uncertainty.

Principal-agent problems normally arise when one person (an agent) acts on behalf of another (the principal). Specifically, the delegation of authority to the agent may result in the agent taking actions that are not in the principal's best interests which are unknown to the principal (Jensen and Meckling, 1976). The fundamental assumption of agency problem is that individuals are self-interested and will act

opportunistically. When there is conflict between the interests of the agent and the principal, the agent might act in his/her own self-interest.

In the context of venture capital investment, there are two sets of agency relationships involved, i.e. the relationship between the venture capitalist and the ultimate investors of venture capital funds and, the relationship between the venture capitalist and the entrepreneur. In the 'venture capitalist-fund investor' relationship, VCs act as agents who invest the capital on behalf of the ultimate investors whereas the ultimate investors of venture funds act principals who delegate their authority to VCs. In the 'venture capitalist-entrepreneur' relationship, however, VCs act as principals who provide capital to entrepreneurs whereas entrepreneurs act as agents who are involved in daily management of the ventures on behalf of VCs.

Agency problems can be more serious when the contracts are written in a world with more severe information asymmetry and higher level of uncertainty. Information asymmetry occurs when one party to a transaction has more or better information than the other party (Akerlof, 1976). When the agent has better information on his/her own skill and on how well the investment is made than the principal, it is hard for the principal to monitor and assess the performance of the agent that the agent may have an to act inappropriately (from the view of the principal) if the interests of the agent and the principal are not aligned (Spence and Zeckhauser, 1974; Stiglitz, 1971). In addition, higher level of uncertainty may also lead to more serious agency problems. Researchers suggest that even when the information is symmetric to the two parties, contracts are not complete in reality because human beings' rationality is bounded (Simon, 1979). The contract difficulties are more serious when the transaction is associated with more uncertainty that may lead to (Holmstrom and Milgrom, 1987; Hart, 1988). In this case, the more uncertainty the investment encounters, the more serious the agency problems emerge.

Venture capital investment encounters severe information asymmetric problems and high level of uncertainty that determine the agency problems are more serious. Primarily, as stated, venture capital investment is highly specialised that the ultimate investors of the venture capital funds are not able to fully observe how many efforts the venture capitalist exerts and how well the funds are managed whilst the venture capitalist has much more and better information. At the same time, there are

also severe information asymmetries between venture capitalists and the entrepreneurs they back. That is, it is very hard for venture capitalists to fully observe and verify the efforts made by the entrepreneurs and the performance of the projects. First, the information disclosure rule for privately held companies is not as rigorous as those for public companies. Second, it is normally more difficult to verify the quality of information since the young companies are lack of historical records. Finally, the uncertainty associated with venture capital investment is very high since the targeted young companies normally face more uncertainty with the technology, product and service, market acceptance and management capability etc. than the mature ventures.

In summary, the severe information problems and high level of uncertainty involved in venture capital investment induce serious agency problems in both fund raising and capital investing processes. Almost all the widely used mechanisms in venture capital investment are therefore focused on how to provide appropriate incentives to the parties and control and reduce these agency costs.

2.2.4 How Venture Capital is Distinguished from Other Financial Forms?

According to the above introduction, venture capital investment is distinguished from other financial instruments. Primarily, it is different from bank loans. Venture capital investment is not in the form of debt; rather, it is in the form of equity investment. Made as cash in exchange for shares of the portfolio companies, venture capital investment normally takes higher degree of uncertainties than bank loans since the investment thus might be fully sunk if the project fails. At the same time, as shareholders, VCs are much more heavily involved in the management of their portfolio companies than banks (Gompers and Lerner, 1999).

Moreover, venture capital is also different from public equity investment. Venture capital investment targets young companies with growing potentials, which are normally not able to issue public offerings. By investing in privately held ventures, venture capital investment encounters poorer liquidity than those investments in public capital markets. At the same time, venture capitalists as investors face much more severe information asymmetric problems than investors in public capital markets where the listed companies have to face very rigorous information disclosure rules.

Furthermore, venture capital is also different from non-venture private equity investments, e.g. buy-outs, restructure and mezzanine funds etc. Even though both as in the form of equity investment, normally, the targets of venture capital investment are companies at earlier or expansion stages of development whereas the targets of non-venture private equity investments are those at later stages of development. In addition, most of non-venture private equity investments are associated with debts. Thus, targeting immature ventures, venture capital investment bears more uncertainties than non-venture private equity investments.

Finally, venture capital investment is also different from angel capital. Normally, angel investors are affluent individuals who provide capital for a business start-up, usually in exchange for convertible debt or ownership equity. Similar to venture capital investment, angel capital is also a form of private equity investment. However, unlike venture capitalists, who manage the pooled money of others in a professionally managed fund, angel investors typically invest their own funds. In this case, venture capital investment is more complex than angel capital in terms of the stakeholder composition and the layers of agency issues. In addition, the size of capital and the portfolio for venture capital funds are normally larger than those of angel capital are.

In summary, venture capital investment is different from many other forms of investment by funding younger ventures in the form of private equity. It encounters more severe information asymmetries that might lead to more serious agency problems. In addition, the poorer liquidity and the lack of collateral requirements may also reduce the downside protection for the investment. Therefore, VCs normally carry a higher risk-return profile than other institutional investors to compensate the higher rate of failure.

Since the great success of ‘Silicon Valley’, venture capital investment has been recognized as one of the most important factors that impact on the rapid development of high-technology companies in the US. In the past twenty years, many nations began to initiate venture capital programs with the expectation to stimulate entrepreneurial R&D activities by duplicating the ‘American model’. However, it should be noted that even in the United States, modern venture capital industry is still young and the development of this industry has been closely

associated with the special institutional changes in this country. In the next text, the evolution of venture capital industry in the US is introduced.

2.3 The History of Venture Capital Industry in the US

2.3.1 The Emergence of Venture Capital Investment

Venture capital investment emerged as an innovative financing instrument under a special political and economic context in the US in the 1940s. Historical events such as The Great Depression in 1929, the First New Deal in the 1930s and, the World War II in the 1940s all had impacts on the appearance of venture capital investment⁵. The emergence of venture capital investment as a financial means was not only a result of market and technological development of industries and the practical choice of businessmen and investment bankers, but also an ideological ideal of government officers and scholars.

First of all, the decline of venture investing from both wealthy individuals and investment banks after The Great Depression made it very difficult for new businesses to gain start-up capital from private markets. In addition, the regulations on IPO issued during the First New Deal (e.g. Securities Exchange Act of 1934; Glass-Steagall Act of 1933; competitive bidding requirements for underwriting etc.) further reduced the opportunities for young companies' financing from the public stock markets.

At the same time, investment bankers were under heavy pressures due to the increase of internalized investment of large corporations and government funding during the World War II when more funds and decision-making power shifted from individuals to institutional financiers like investment banks. They were eager to find out some new ways to invest the funds.

During the World War II some technologically intensive enterprises generated great amount of profits with the supports of the US government. The successes based on the collaboration of funds, R&D activities and management expertise attracted institutional financiers. Therefore, they called for a new way of venture financing to overcome the potential post-war depression and take good use of the technologies developed during the war. An important part of this approach was

⁵ See Reiner (1991) for more detailed analysis of the emergence of venture capital investment in the US.

to develop distinctive networks of information about human resources, technologies and markets.

The first venture capital institution, the American Research & Development Corporation (AR&D) was established in 1946 in Boston by General George Doriot with a group of businessmen, scientists and university administrators⁶. Raising funds from both institutions and individuals and investing the capital in new technological businesses, the venture capitalists assessed and managed the projects in more professional ways. The greatest success of AR&D was the \$ 70,000 investment in Digital Equipment Company in 1957 which issued IPO in 1968 with the market value of \$355 Mil.

2.3.2 The Professionalization of Venture Capital Investment

Venture capital sector did not attract much attention in the early years of its emergence. The industry has been modest in terms of the size of capital pool and disbursements of capital for about 30 years. Even though the Small Business Investment Act of 1958 authorized the US Small Business Administration (SBA) to license private ‘Small Business Investment Companies’ (SBICs) to provide financing and management assistance to small entrepreneurial businesses in the United States, the industry developed very slowly due to the lack of institutional investors (see Figure 2.1). Because institutional investors are reluctant to invest, most venture capital funds were closed-end fund and marketed to individuals or SBICs before the 1970s (Gompers and Lerner, 1999).

The growth of venture capital industry accelerated in the 1970s associated with legislative, regulatory, market, and technological dynamics in the United States. The industry experienced significant changes in terms of fundraising, disbursement, sources of capital and the organizational structure of the venture capital institutions in the 1970s. Primarily, the stock market went into slump after the IPO wave in 1968. Then, after the Congress legislated against the abuse of pension fund money in 1974,

⁶ The major founders of AR&D were as follows: General Georges Doriot, a French-born military man who is considered as ‘the father of venture capital’. He has been a professor at Harvard Business School after the World War II until 1966. Ralph Flanders, an American mechanical engineer and industrialist who has been the president of the Federal Reserve Board in Boston, Massachusetts from 1944 to 1946. Karl Compton, a prominent American physicist who has been the president of the Massachusetts Institute of Technology (MIT) from 1930 to 1948. Merrill Griswold, an American investment banker who was the Chairman of Massachusetts Investors Trust in 1946.

all high-risk investment in these funds was halted. However, when the NYSE tightened up the regulations on IPO, NASDAQ was established in 1971. It is an electronic stock market targeting young companies without sufficient profit records but have promising potentials. It provided an alternative exit channel for venture capital investment.

In addition, there were regulations on investment of pension funds and taxation in the late 1970s that allowed the inflow of funds into the venture capital industry. First, the capital gains tax rate was reduced from 49.5 per cent to 28 per cent in 1978. Then the amendment to the 'Prudent Man' rule in 1979 confirmed that pension fund managers are allowed to invest part of the funds in high-risk assets. The relaxation of regulation on pension fund investment led a great increase of fund inflow into the venture capital market (Gompers and Lerner, 1999).

Moreover, the technological improvement also accelerated the development of the venture capital industry. The increasing use of personal computers in research and business and the development of biotechnology attracted much attention from investors. There were a number of venture capital-backed innovative companies issued IPO with great success. These included Fed-Ex in 1978, Apple Computer and Genetech in 1981. This phenomenon attracted further interests from individual and institutional financiers. A great amount of capital flowed into the venture capital industry from public and pension funds, endowments, foundations, insurance companies, banks, individuals and other entities. The industry experienced its first sharp increase in the 1980s. In 1978, the new fund raised per year was less than \$ 500 million. The amount rose to more than \$ 6.2 billion in 1987.

Associated with the increase of fundraising and the expansion of capital sources, the composition of venture capitalists and the structure of venture capital institutions also experienced changes. First, increasing number of investment advisors began to enter into the market since the 1980s. They mainly advise large public or pension funds in project selecting and monitoring based on their professional knowledge and pooled resources. At the same time, limited partnership as an organizational structure gained more popularity among venture capital institutions in the 1980s. The percentage of limited partnership rose from 40 per cent in 1980 to 80 per cent in 1988.

Venture capital industry has achieved a steady growth during most of the 1980s and then a reverse in the late 1980s and the early 1990s. Researchers suggest that the decrease was due to the disappointing performance of inexperienced venture capitalists who stepped into the industry in the early 1980s (Gompers, 1994). In addition, the crash of the stock markets in 1987 obviously influenced the industry negatively. In 1991, the size of new raised funds dropped to less than \$ 1.8 billion from \$ 6.2 billion in 1987.

2.3.3 The Boom and Fluctuation of Venture Capital Investment

The boom of venture capital investment arrived in the second half of the 1990s with the economic recovery and the rapid development of the internet industry.

After the crash of stock market in 1987, venture capital industry has experienced a long-term downturn. According to the statistics of National Venture Capital Association, the average of internal rate of return (IRR) of the venture capital firms dropped to 8 per cent by 1990 from 25 per cent in the 1980s. Disappointed fund investors withdrew from venture investing. At the same time, many inexperienced venture capitalists that entered into the industry in the 1980s left due to the unsatisfactory performance.

However, the economic recovery and the IPO booms in the first half of the 1990s established a friendlier macroeconomic environment for venture capital investment. The annual GDP growth rate increased from -0.2 per cent in 1990 to 4 per cent in 1994 in the United States. At the same time, the total number of IPO cases in NYSE and NASDAQ sharply rose from 89 in the year of 1990 to 424 in 1995. With the economic growth in the early 1990s, high-technology industry also experienced rapid development. The most striking phenomenon is the emergence and rapid rise of the internet industry. It was estimated that the internet industry grew by 100 per cent per year, with a brief period of explosive growth in 1996 and 1997 (Coffman and Odlyzko, 1998).

Realizing the remarkable rise in the market value of the internet sectors and related fields, venture capitalists moved fast into the industry. At the same time, the low interest rates in the late 1990s further helped to increase the venture capital investment. According to the data of VentureEconomics, the amount invested by

venture capitalists in the United States increased from \$7 billion in 1995 to \$ 11.5 billion in 1997 and further rose to \$103 billion in 2000.

However, the increase did not sustain for long. The crash of the 'Dot Com Bubble' in 2000 and then the collapse of NASDAQ led to a sharp drop of the industry. In 2001, the annual fundraising size reduced to \$41 billion and further dropped to \$8 billion in 2002 which was lower than that in 1996. The depression was not overcome till the end of 2003. From 2004, with another wave of investment in the internet industry and the increasing globalization of venture capital investment, the industry began to steadily recover. In the United States, the new funds raised in 2005 were \$25.6 billion which was still much lower than \$32.9 billion in 1998.

In general, the venture capital industry experienced the most dramatic rise and fall from 1996 to 2003 and then got back to a steady recovery track by 2004 in the United States. If the dynamics of the sector in the 1980s were mainly due to institutional changes, then the significant fluctuation during the late 1990s was mainly credited to the changes of market speculations on the internet industry.

To summarize, the development of the venture capital industry in the United States shows that the development of venture capital market is path-dependent. It is a result of complicated interaction of different institutions including legal, political, economic and technological elements. In particular, the government has played an important role in the development of venture capital industry. For example, the government initiatives such as the Small Business Investment Corporations program, the changes of capital gain tax policy and the relaxation of investment regulation for pension funds etc. have helped accelerating the capital accumulation and professionalizing VCs' investment activities (Kenney et al., 2004; Gompers, 1994). Besides, the individuals have also tried to adjust the ways on how they govern the relationship between each other with the overall institutional dynamics. For example, with more interests from institutional investors since 1980s, venture capital funds are mainly organized as limited partnerships currently instead of being structured as close-ended public traded funds. All these phenomena suggest that institutions have strong impact on the development of venture capital industry as a whole on the one hand, and on how the individuals structure their business organizations on the other hand. This is consistent with new institutional economics that believes economic

growth and business activities result from institutions and institutional changes both at a given time and over time (North, 1990; Williamson, 1991).

2.4 The Significance of Venture Capital Investment

2.4.1 The Globalization of Venture Capital Investment

Venture capital investment has attracted increasing interests from both researchers and policymakers since the 1980s. It is widely believed that venture capital investment is a good solution to fill up the funding gaps faced by young R&D ventures, and consequently, stimulates national innovation and economic growth (Bygrave, 1987; Gompers and Lerner, 1999). Since the 1980s, many nations in Europe and Asia began to initiate public programs to stimulate venture capital activities⁷. Most countries try to duplicate the ‘American Model’ to build up a friendly environment for the venture capital sector by stimulating both demand and supply sides of the investment, i.e. providing subsidies and preferential taxation policies to both start-up companies and venture capital institutions, undertaking regulatory changes in pension funds and insurance funds management, and building up secondary stock markets etc⁸.

Currently, there are over 30 national venture capital associations around the world. Venture capital has become a central institution in some of the most dynamic, innovative firm clusters in the world (Kenney et al., 2000). According to the Global Venture Capital Insight Report produced by Ernst & Young, in 2005, venture capital investments worldwide reached to \$31.3 billion (€25.8 billion). Additionally, in 2005, \$26.5 billion (€22.3 billion) new venture funds were raised in the United States, Europe, and Israel according to Dow Jones VentureOne.

At the same time, the increasing cross-boarder operations of the United States, European and some Asian venture capital and private equity institutions further speed up the globalization of the innovative financing means. In particular, developing countries have attracted strong interests from the cross-boarder funds. According to the 2005 Global Venture Capital Survey conducted jointly by Deloitte

⁷ For example, Yozma in Israel, SBICs in Japan, SEAVI in Singapore, BTU in Germany, AEFI in Ireland, RVCF in UK, etc.

⁸ For example, the capital gains tax rate was reduced from forty-nine point five percent to twenty-eight percent in 1978. Additionally, the amendment to the "Prudent Man" rule in 1979 confirmed that pension fund managers are allowed to invest part of the funds in high-risk assets.

& Touche LLP and NVCA, the countries of greatest investment interest in the next five years for the 222 surveyed venture capitalists in the United States, are China (20%), India (18%), Canada/Mexico (13%), Continental Europe (13%), Israel (12%) and the United Kingdom (11%) Meanwhile, the United States maintains as the most favourite destination of venture capital funds in the world.

Despite the decline after the Dot-com bubble, the venture capital industry around the world has been marked by unprecedented transition, growth and optimism in the past decade. At the same time, although the development of venture capital markets around the world is far from homogeneous (Jeng and Wells, 2000; Allen and Song, 2005), studies have shown that the economic and social impacts of venture capital investment in many parts of the world are remarkable.

2.4.2 The Impact of Venture Capital Investment on Innovation

The significance of venture capital investment is particularly seen in its strong positive impacts on innovation. Above all, venture capital investment has shown great power in financing young R&D ventures that are normally neglected by traditional financiers. Moreover, empirical studies show that venture capital investment has significant impacts on innovative capability and knowledge absorptive capacity of their portfolio companies (Kortum and Lerner, 2000; Romain and Pottelsberghe, 2004).

The perspective that innovation is one of the most critical factors for sustainable economic growth and social development has no longer been a new idea since Schumpeter⁹ (Solow, 1956; Cass, 1965). Studies further suggest that R&D activities, especially entrepreneurial R&D activities are utmost important for innovation and consequently economic growth (Romer, 1986; Aghion and Tirole; 1997). However, traditional financiers are reluctant to invest in R&D activities, especially newly established R&D ventures due to the serious agency problems and high level of uncertainty associated with R&D investment (Hall, 2002). Studies show that the underinvestment problems for R&D activities are rigorous even in the United States where financial systems are considered as very advanced (Jones and Williams, 2001).

⁹ Schumpeter (1942) discussed the power of technological changes to economic development since industrial revolution.

With the great success of ‘Silicon Valley’, venture capital investment is recognized as a good solution to fill up the funding gaps faced by young R&D ventures. Primarily, although venture capital investment by definition does not target at high-technology companies, evidence shows that venture capital investment is heavily concentrated on high-technology companies. It is widely accepted that venture capital organizations have much to do with the rising leadership of US companies in high-technology industries (Lerner, 2001). A group of most prominent US high-technology giants such as DEC, Apple Computer, Intel, Microsoft, Google and Yahoo! etc. were backed by venture capital investment in the past three decades. Moreover, venture capital investment has shown increasing capability in supporting young R&D ventures in other parts of the world. As seen in Table 2.1, in most countries and regions except Japan, the majority of venture capital investment is made in high-technology industries though the distribution varies substantially across countries. In particular, high-technology companies have attracted overwhelmingly intensive interests from venture capitalists in the United States, Israel and Taiwan. In addition, more than half of the companies were at early or expansion stages at the time of venture financing in all the countries in the table. Again, venture capitalists in Taiwan and Israel stand them out from their peers in other countries with their capability to fund companies at earlier stages.

Table 2.1 Distribution of Venture Capital Investment across Countries (1990-2006)¹⁰

	US	Israel	Taiwan	UK	France	Japan
Hi-tech (%)	84.19	93.01	87.37	63.10	61.03	25.49
Early (%)	21.8	31.01	44.69	21.13	17.64	5.63
Expansion (%)	44.85	59.93	39.85	50.65	38.12	50.19
Late (%)	33.35	9.06	15.46	28.22	44.24	44.18

More importantly, studies shows that venture capital investment has positive impacts on innovative capability of their portfolio companies. According to NVCA, venture capital backed ventures invested almost three times as much in R&D as the average non-venture capital backed public companies in the US in 2002. At the same

¹⁰ For each country, the distribution of venture capital investment by technology and development stage is calculated by the author based on the firm level data provided by ‘VentureEconomics’ database.

time, Kortum and Lerner (2000) estimate that one dollar of venture capital produces three times more patents than one dollar of traditional corporate R&D investment in the United States. They show that while from 1983 to 1992, the ratio of venture capital investment to R&D was on average smaller than three percent, venture capital investment have accounted for eight per cent of industrial innovations during that period. In addition, based on a survey of 149 ventures in Silicon Valley, Hellmann and Puri (2000) find that venture capital backed firms bring their products to the market faster than other non-venture-capital backed firms in the United States. Using Multi-Factor Productivity (MFP) growth as a measure of innovation, Ueda and Hirukawa (2003) find that MFP growth is significantly and positively associated with subsequent VC investments in the US. This effect is especially visible seen in computer and communication sectors.

The impact of venture capital investment on innovation in other parts of the world is also documented. According to an EVCA report, venture capital backed companies spent on average 50500 Euro per employee per year on R&D activities that is six times more than the R&D expenditure per employee of the 500 companies in the EU 25. At the same time, every third employee in the venture capital backed companies works in R&D with 13 per cent of the employees holding a PhD or equivalent degree in 2004¹¹. Based on a panel of 16 OECD countries from 1990 to 2001, Romain and Pottelsberghe (2004) find that accumulation of venture capital investment improves the output elasticity of R&D. Increased venture capital intensity makes it easier to absorb the knowledge generated by universities and firms. In addition, based on aggregate data in Germany, Audretsch and Keilbach (2002) provide similar evidence by showing venture capital investment is a significant and important factor that shapes output and productivity in a region. Besides, anecdotal evidence shows that the rising of electronic and semi-conductor industries in Taiwan and the software industry in Israel are also significantly benefited from venture capital investment (Kenney et al, 2004).

¹¹ For details, see research report 'Employment Contribution of Private Equity and Venture Capital in Europe' conducted by Ann-Kristin Achleitner and Oliver Klockner in 2005 on behalf EVCA. (http://www.evca.com/images/attachments/tmpl_9_art_129_att_953.pdf)

2.4.3 General Social and Economic Impacts of Venture Capital Investment

Besides the direct impacts of venture capital investment on R&D entrepreneurial activities and innovation, the positive economic and social impacts of venture capital investment from other stands are also documented and discussed by researchers and policymakers.

Primarily, statistics show that venture capital investment has great capability in job creation and revenue generation, and, consequently has positive impacts on local economy. According to the 'Global Insight 2004' released by NVCA, venture capital backed companies accounted for \$1.8 trillion in revenue and provided 10.1 million jobs in the US in 2003. In addition, according to a study carried out by Data Resources Inc. and Wharton Econometric Forecasting Association (DRI-WEFA)¹² in 2002, US venture capital backed ventures had approximately twice the sales, paid three times the federal taxes and generated almost twice exports than non venture capital backed ventures over the period from 1970 to 2000.

In Europe, according a survey conducted by EVCA¹³, 420,000 new jobs were created by venture capital backed companies between 2000 and 2004. Employment in venture capital backed companies grew by an average rate of 30.5 per cent annually over the period between 1997 and 2004. This is nearly forty times the annual growth rate of total employment in the European Union (EU) member states (0.7%) between the 2000 and 2004. Among the surveyed companies, 73 per cent increased the number of employees by more than 25 per cent on average per year. In the United Kingdom, according to a survey conducted by British Venture capital Association (BVCA) in 2006, venture capital backed companies increased their UK employment by nine per cent per year, compared to a national fall in employment of 0.4 per cent per year over the five-year period to 2005/2006. In the year 2006, over 2.8 million of Britons, or 19 per cent of private workforce in the United Kingdom was employed by private equity backed firms in 2006¹⁴. It also suggests that private equity backed firms grow three times faster than firms in Financial Times Stock Exchange Index 100 in the United Kingdom. Similarly, with a panel dataset of about

¹² DRI-WEFA now called Global Insight, Inc. was formed to bring together the two most respected economic and financial information companies in the world, DRI (Data Resources Inc.) and WEFA (Wharton Econometric Forecasting Associates).

¹³ For details, see http://www.evca.com/images/attachments/tmpl_9_art_129_att_953.pdf.

¹⁴ See <http://www.bvca.co.uk>.

1,000 German start-ups, Engel (2002) shows that the surviving German venture capital backed companies seem to achieve significant higher growth rates compared to non venture capital backed companies.

Moreover, studies also provide that venture capital investment plays an important role in IPOs. Comparing the IPO price of venture capital backed and non venture capital backed companies between 1978 and 1987, Barry et al. (1990) find that venture capital backed companies are less underpriced in the US. Megginson and Weiss (1991) suggest that venture capital investment may have positive certifying effects to investors. Based on the data from the US, the authors provide further evidence that the underpricing of venture capital backed companies are far less than that of non venture capital backed ventures. At the same time, the author find that the underwriters for venture capital backed companies are much more experienced, and, the costs for IPOs of venture capital backed companies are much lower, compared with those of non venture capital backed companies. Bottazzi und Da Rin (2002) support the above findings by providing evidence that European venture capital financed firms are able to come up with significantly more capital in the IPO process.

In summary, although in terms of the capital size, venture capital investment is still modest compared with other institutional financiers, the economic and social impacts of venture capital are remarkable in many parts of the world. The impact of venture capital investment is particular seen in its capability to fill up the funding gaps faced by young R&D ventures, and, consequently stimulate innovation and economic growth.

2.4.4 The Heterogeneity of Venture Capital Markets around the World

Although venture capital investment has been transferred to many regions of the world and both studies and statistics suggest that venture capital investment have positive impact on innovation and economic growth, it is noted that the development of the market is heterogeneous.

As it is discussed, the disbursement and the total capital pool across countries are not balanced distributed (see Table 1.1 for details). In some countries, the venture capital market has developed very fast whereas in some others it grows slowly (Jeng and Wells, 2000; Allen and Song, 2005).

Moreover, studies show that there are substantial variations in venture capitalists' capability to support R&D entrepreneurial activities. Above all, researchers find that the distribution of venture capital investment by technology and development stage varies across countries (Jeng and Wells, 2000; Mayer et al., 2005). For example, in some European countries, venture capitalists invest more in companies at later stages and with less technological intensity compared with those in the United States. This heterogeneity is even seen within the United States. For example, venture capital institutions and their portfolio companies in the United States are clustered in Silicon Valley, Boston and New York City. Additionally, researchers find that venture capitalists in Silicon Valley and Massachusetts invest more in early-staged projects compared with those in New York City (Saxenian, 1990). In addition, the mechanisms used in venture capital investment in different countries are also different (Cummings et al, 2003; Kaplan et al., 2003). These phenomena have attracted increasing interests from researchers to find out what the major factors are that affect the transplantation of venture capital investment.

2.5 Summary

As an innovative private equity investment instrument, venture capital investment stands out from traditional financing means in many ways. By devoting both capital and management expertise, venture capitalists finance projects of higher level of uncertainties by channelling institutional and individual wealth to a class of businesses. It is recognized as a good solution to fill up the funding gaps faced by young R&D ventures, which are normally neglected by traditional institutional financiers.

This form of investment, however, is encountered with high level investment uncertainties. The severe information asymmetry problems in both fundraising and capital investing processes determine that the agency problems in venture capital investment are more complex and more serious than those in traditional financial means. Moreover, the poor liquidity and the lack of collateral requirements of venture capital investment further reduce the downside protection of the investment.

At the same time, the trajectory of venture capital industry in the US shows that that the development of venture capital investment is not isolated from institutions. The institutional dynamics have strong impacts on both the supplying

and demanding sides of venture capital investment on the one hand; and, on the ways of how the individual stakeholders govern the relationship between each other on the other hand.

In summary, the characteristics of venture capital investment and the development of venture capital industry suggests that the two major issues are important for us to understand venture capital investment: i.e. the agency problems in venture capital investment and, the interaction of the players of venture capital investment and the related institutional environments and arrangements. In the next chapter, the existing literature is therefore introduced with the focus on the mechanisms employed in venture capital investment that deal with the agency problems and institutional issues.

Chapter 3 Agency and Institutional Issues in Venture Capital Investment: Literature Review

3.1 Introduction

This chapter reviews relevant studies on venture capital investment with the focuses on how venture capital investment works to deal with the agency and institutional issues. The studies on agency issues in venture capital investment are reviewed with two strands, i.e. the literature on agency relationship between venture capitalists and the ultimate investors of venture funds, and, the studies on agency relationship between venture capitalists and the entrepreneurs. The existing studies on institutional issues in venture capital investment are discussed with the emphasis on the impacts of legal and financial institutions. Based on the critical review of the existing literature, the knowledge gaps are discussed, and, the specific research questions in this study and how this study may contribute to the existing literature are consequently clarified.

This Chapter is organized as follows: The next section introduces the literature on the relationship between venture capitalists and venture fund investors. Section 3 discusses the mechanisms employed by venture capitalists in governing portfolio companies. Section 4 introduces the literature on institutions and the relationship between institutions and venture capital investment. Section 5 addresses issues and knowledge gaps in the existing literature. Section 6 clarifies the research questions of this study based on the discussion on knowledge gaps in China's venture capital investment. The last section summarizes this chapter.

3.2 Fundraising: Relationship between VCs and Fund Investors

As stated in the foregoing section, venture capitalists need to raise funds from various sources and conduct venturing investment on behalf of the ultimate fund investors. This raises agency problems because monitoring the prospects and understanding the business of each individual investment case is extraordinary difficult for investors. Venture capitalists have opportunities to behave opportunistically and take the advantage of the delegated power (Schmidt, 2003). Currently, research on the relationship between venture capitalists and fund investors

is mainly based on observations in the United States. Studies suggest that limited partnership as an organizational form for venture capital firms and the sophisticated covenants of the venture fund contracts are the most powerful solutions in dealing with agency problems in venture capital fundraising (Gompers and Lerner, 1996, 1999; Fenn and Liang, 1995).

3.2.1 Limited Partnership and Agency Problems

Limited partnership as an organizational form is widely used in venture capital investment in the US since the 1980. In a limited partnership, fund investors, who are normally private and public pension funds, endowment funds, corporations, wealthy individuals and foreign investors, are limited partners who contribute the majority of the capital (normally 99%) (Sahlman, 1990). The fund investors are not involved in the daily operation of the partnership in order to retain limited liability status and to receive favourable tax treatment¹⁵. Venture capitalists are general partners who are responsible for running the partnership. The limited partnership is normally designed to be self-liquidating; a lifespan of a fund is around 7-10 years. Under the terms of the limited partnership agreement, profits are distributed when realized, either in cash or in the form of shares of portfolio companies. Venture capitalists typically manage several funds and raise funds sequentially. About halfway through the life of one fund, they begin raising the next. In general, no liquid market for partnership interests exists, and, limited partners are normally restricted from selling the partnership interests (Gompers and Lerner, 1996).

Based on analysis on 140 private partnership contracts in the US, Gompers and Lerner (1996) suggest that the potential agency problems in venture capital fund management are serious since fund investors are not allowed to interfere daily management of the limited partnership that they may not have enough information on how many efforts the venture capitalists exert and how well the investments are made. According to the authors, venture capitalists may not exert enough efforts since his/her share is small. At the same time, the venture capitalist may be reluctant

¹⁵ Venture capital limited partnership can operate tax-free as mutual funds. In addition, the transfer of securities to individual limited partners will not have tax consequences until they are sold. These tax advantages can be achieved as long as the limited partnership satisfies four conditions: 1) a finite term life; 2) transfer of limited partnership interests is restricted; 3) early withdrawal from the partnership is prohibited; 4) and limited partners can not participate the active management of the partnerships (Sahlman, 1990).

to take risks for higher return since he/she takes unlimited liability of the loss. Furthermore, the venture capitalist begins raising a new fund before his current fund ends. It may create the bias toward producing currently visible results at the expense of long-term value. It also may create an incentive for the venture capitalist to take excessive risks at the late stages of fund's existence, especially if the fund has done poorly. Researchers suggest that there are two primary mechanisms in the limited partnership agreement that address the agency problems. The first is a set of covenants that restrict the venture capitalist's activities. The second is a compensation structure that aligns the interests of venture capitalists with the ultimate investors of the venture funds.

3.2.2 Covenants in Venture Partnerships

Gompers and Lerner (1996) find that sophisticated covenants are designed to address the agency problems in venture capital partnership agreements. Three major groups of covenants are explored in their study.

According to the authors, the first group of covenants relates to the management of the venture fund. These covenants include '*(a) restrictions on the amount invested in a single firm, (b) restrictions on the retention of partnership profits, (c) restrictions on the extent to which one fund can invest in the portfolio companies of another fund run by the same venture capital firm, and (d) restrictions on debt*' (Gompers and Lerner, 1996). The authors suggest that this set of covenants imposes financial discipline on the venture capitalist. '*They limit the venture capitalist's ability to prop up under-performing firms in his portfolio; they prevent him from using a successful fund to salvage an unsuccessful fund; they make the performance of each fund more transparent to investors; and they limit the venture capitalist's ability to take risk. In addition, the requirement that the venture capital firm distribute profits prevents him from accumulating funds and thereby inflating his percentage-of-assets fee*'.

The second group of covenants addresses the opportunities for conflicts. The covenants restrict the venture capitalist to invest personal capital in the portfolio companies. With these covenants, investors try to prevent the venture capitalist taking benefits disproportionate to those of the investors on the one hand, and keep the venture capitalist concentrate on the current fund on the other hand.

The last group of covenants restricts the investment focus of the fund. These covenants again aim to prevent the venture capitalist from using investors' money to create private benefits. In some cases, *'a venture capitalist might want to experiment with certain types of investments, such as leveraged buy-outs, in order to establish a reputation in a new field that he plans to target in a future fund'* (Gompers and Lerner, 1996).

In summary, research suggests that the covenants of venture capital fund agreements mainly deal with the potential interest conflicts between the two parties with the financial restrictions on venture capitalists and the restrictions on the investment strategies of the venture funds.

3.2.3 Compensation Structure of the Venture Partnership

According to Sahlman (1990), venture capitalists usually receive 2.5 per cent of total capital per year as annual management fees and, 20 per cent of total profits as compensation. This compensation package is highly sensitive to venture capitalists' performance. The shared profit part of the compensation is more than three times higher than the base pay part. As long as the compound return rate is positive, shared profits always increase faster than the base pay. Researchers suggest that the strong performance sensitive compensation for general partners may help align venture capitalists' interests with investors' interests (Fenn and Liang, 1995).

Gompers and Lerner (1996) provide empirical evidence for the performance sensitivity of the compensation in venture partnership. Based on an analysis of 140 venture capital partnership agreements in the US, the authors find that more experienced venture capitalists take a lower fixed fee. The compensation of these venture capitalists is thus more performance-sensitive than that of others. However, the compensation of the least-known venture capitalists is less performance-sensitive than that of the best-known venture capitalists. The authors suggest that new venture capitalists have incentives to perform in order to build up reputations that will yield rewards in the future. Consistently, Gompers and Lerner (1999b) find that the performance-sensitive pay for venture capitalists does not correlate with better fund performance. It confirms that new venture capitalists' extra-contractual incentives are as powerful as the contractual incentives of established venture capitalists.

In summary, the existing studies suggest that the limited partnership is an appropriate organizational structure to solve the agency problems in venture capital fund management. However, almost all the existing studies are based on the US data. How limited partnership impacts on venture capital investment in other venture capital markets is not well studied.

3.3 Venture Capital Investing: Relationship between VCs and Entrepreneurs

As discussed, investment in young companies with high growing potentials is associated with serious agency problems due to the severe information asymmetries. How venture capitalists control the agency problems and other uncertainties have long been the major interests among researchers. Researchers suggest that venture capitalists are able to reduce informational asymmetries and control agency costs with their special pre-investment decision-making process, unique contract design, active post-investment oversights and value added activities (Gorman and Sahlman, 1989; Gompers, 1994; Kaplan and Per Stromberg, 2003). This section introduces the relevant studies on the mechanisms employed in venture capital investment that deal with the agency relationship between venture capitalists and entrepreneurs.

3.3.1 VCs' Decision-making Process

Studies on venture capitalist's decision-making process are among the first literature in venture capital research. Most of the existing literature focuses on documenting the decision-making process of venture capital investment in details.

Wells (1974) describes venture capital investment decision-making process based on interviews with venture capitalists from eight venture capital firms in the United States. According to Wells' exploratory study, searching for projects, screening proposals and evaluating projects are the sequential processes in decision-making of venture financing. Besides, Tyebjee and Bruno (1984) find that deal structuring is also an important step in pre-investment decision making. Additionally, other researchers further reveal that due diligences during which the venture capitalist investigates the projects in field is also a common process in ex-ante decision-making of venture capital investment (Hall and Hofer, 1989; Fried and Hisrich, 1994; Boocock and Woods, 1997; Bliss, 1999).

The existing literature provides stylized facts on how venture capitalists make investment decisions in developed countries with only one exception that is focused

on Poland (Bliss, 1999). There is little known about the decision making process in developing countries where have different institutional arrangements from the developed economies.

3.3.2 Ex-ante Project Screening in Venture Capital Investment

According to the existing literature, venture capitalists employ sophisticated project screening strategies to avoid investing in bad projects. The project screening criteria have been studied extensively. The literature covers three major topics. Most studies in this area explore the criteria used by venture capitalists and ascertaining the relative importance of various criteria in the proposal screening (Wells, 1974; Tyebjee and Bruno, 1981; Macmillan et al., 1985; Knight, 1994; Maigart et al., 1996; Bruton and Ahlstrom 2003). Some other researchers identify the relationship between the screening criteria and the performance of the selected projects (MacMillan et al., 1987; Tyebjee and Bruno, 1984). Some more recent studies analyze the relationship between screening criteria and contracting arrangements of venture investment based on financing contracting theories (Kaplan and Per Stromberg, 2003, 2004).

Tyebjee and Bruno (1984) are those who first identified a set of project screening criteria in venture capital investment. Following this work, a number of studies were conducted to confirm their findings. Focusing on venture capitalists' screening criteria in the United States, the studies yielded almost the same set of investment evaluation criteria. MacMillan et al. (1985), based on interviews with 14 venture capitalists in the US, came up with a list of 27 criteria. The authors categorized them into six sets, namely, (i) the entrepreneur's personality, (ii) the entrepreneur's experience, (iii) the characteristics of the product or service, (iv) the characteristics of the market, (v) financial considerations and, (vi) the characteristics of the venture team. It is revealed that 'human factors' like the entrepreneurs' personality and experience and, the capability of the management team are utmost important for venture capitalists when they screen the venture projects. For instance, according to MacMillan et al. (1985), five of the top ten most important criteria had to do with the entrepreneur's experience or personality. At the same time, other factors including the attractiveness of products and service, market size and growth, business model, the customer adoption, favourable competitive position and cash out

potentials are also important concerns of venture capitalists in their proposal screening in the United States though the levels of importance of the criteria are different by studies.

Echoing to the criteria that are seen as advantages by venture capitalist in project screening, the risks concerned by venture capitalists are also studied. Again, based on investigations in the United States, MacMillan et al. (1985) identified six categories of risks. Half of the risk factors are related to human aspects that further confirms the concerns with human capital from venture capitalists in their project screening.

The second research wave of studies in this area emphasizes venture capital industries outside of the United States. Researchers suggest that influenced by legal and economic environments, the risks faced by venture capitalists should differ across countries. It is thus anticipated that the screening criteria employed by venture capitalists across countries should be different. However, studies show that venture capitalists around the world employ very similar screening criteria (Knight, 1994; Muzyka, et al., 1996; Manigart et al., 1996). Similar to their US peers, venture capitalists in most nations see the quality of entrepreneurs and management teams as one of the most important factors in their project screening. For instance, based on a questionnaire survey with venture capitalists from 10 European countries, Muzyka et al., (1996) suggest that five human resource criteria, i.e. the leadership of the entrepreneur, the leadership of the management team, the professional expertise and track record of the entrepreneur and the management team are ranked in the top among the 35 criteria. Moreover, studies on developing countries also show strong consensus in screening criteria used by venture capitalists (Ray and Turpin, 1991; Zutshi, et al., 1999).

Nonetheless, heterogeneity indeed exists in screening criteria. Manigart et al. (1996) find that in younger venture capital markets such as European countries like Belgium and France, financial information is shown as more important for venture capitalists than that for their counterparts in the United States. Bruton and Ahlstrom (2003) find that networks (i.e. *Guanxi*) of the entrepreneur and the location of the enterprise are the additional concerns of venture capitalists in Asian countries.

After the first exploratory studies on documenting venture capitalists' screening criteria, researchers start to question whether there is a relationship between the screening scores and the performance of venture capital backed projects (i.e. MacMillan, et al., 1987; Khan, 1987; Fried and Hisrich, 1994; Bliss, 1999). Macmillan et al., (1987) identify two major criteria that are predictors of venture success, which are: 1) the extent to which the venture is initially insulated from competition and 2) the degree to which there is demonstrated market acceptance of the product. With similar research questions, Khan (1987) find that venture capitalists consider the entrepreneur' desires for success and the uniqueness of products as essentials for potential success of the projects. However, the study also shows that venture capitalists' judgments are poor in predicting the actual performance of the projects.

Furthermore, some researchers examine the interaction between venture capitalists' screening criteria and their other investment activities. Kaplan and Per Stromberg (2003, 2004) look at the relationship between project screening and contracting terms of venture investment. Based on interviews and archive analysis on venture capitalists' investment theses in the United States, the authors examine what venture capitalists see as risks and advantages from a projects and how they react accordingly while constructing the investment contracts. The researchers find that venture capitalists' initial appraisal is important for the contract design including the allocation of cash flow right, the stage financing arrangements and CEO's compensation etc. As the first studies in linking venture capitalists' project selection to contract design, this comprehensive work not only provides insights in venture capitalists' ex-ante decision making, but also empirically examines some advanced financial theories based on intensive hand-collected materials though the statistical analysis is not without biases.

3.3.3 Venture Capital Contracting

Most of the existing literature on venture capital investing focuses on contract design and ex-post oversights from agency perspectives. Three major agency problems may be involved in venture capital investment. First, the efforts exerted by the entrepreneur are either unobservable or unverifiable after the capital is infused (Holmstrom, 1979; Hart and Moore, 1994). The entrepreneur may therefore take

opportunistic activities at the prices of the shareholder's interests. Second, the entrepreneur may have more information about their own capability and the projects than the investors (Akerlof, 1976). The entrepreneur may have the incentives to continue the projects inefficiently even he/she knows the projects may fail. Third, entrepreneur may hold up the investors by threatening to leave the company when human capital is valuable in the young high-technology companies (Hart and Moore, 1998). Researchers suggest that venture capitalists design sophisticated financial contracts to control the potential agency problems. The allocation of control rights and cash flow rights, and CEO's compensation arrangements are identified as major contracting mechanisms used in venture capital investment.

3.3.3.1 Allocation of Control Rights

The allocation of direct control rights including voting rights, board seats and veto rights is a widely used mechanism in venture capital investment. The control right mechanism in venture capital contracts is unique in two ways. First, the allocation of control rights is contingent with the potential agency problems in the investment and the performance of venture capital-backed companies. Second, the allocation of control rights is usually disproportionate to the shareholdings of the contracting parties in venture capital investment.

First, the allocation of control rights between the venture capitalist and the entrepreneur is significantly related to the performance of enterprises. Theoretically, Chan et al., (1990) argue that venture capitalists need to retain control rights because they do not have sufficient information on the capability and the efforts exerted by the entrepreneurs. In this model, the entrepreneur's capability and the chosen actions are observed neither ex-ante nor ex-post. Thus, venture capitalists use cash-flow as a signal for the abilities of the entrepreneur. If cash-flow falls below a critical value, venture capitalists take over control in the second period and pay the entrepreneur a fixed salary. If the cash-flow surpasses a critical level, the entrepreneur controls the enterprise and is paid on a pay-for-performance package. Some empirical findings are consistent with the prediction. Kaplan and Per Stromberg (2003) report that control rights such as voting rights and the number of board seats shift gradually from venture capitalists to the entrepreneur as the venture performance improves. Venture capitalists have 66 per cent the voting majority in the pre-revenue stage

compared to 49 per cent in the post-revenue stage under the condition that the contractually specified milestones are met. If the enterprise does not meet the contractually specified milestones, venture capitalists have 87 per cent the voting majority in the pre-revenue stage compared to 59 per cent in the post-revenue stage, respectively. Also, the findings prove that venture capitalists take over control of enterprises more frequently with low performance.

Second, the allocation of control rights between venture capitalists and the entrepreneur is contingent with the level of agency problems and uncertainties of the projects. Deriving from control theory, Aghion and Bolton (1992) and Dewatripont and Tirole (1994) argue that when the risk of the investment is increasing, the more control rights should be held by the financier whereas the risk reduces or performance improves more control should be transferred to the entrepreneur. In accordance with the control theory, Cornelius (1997) finds 62 per cent of the total 77 venture capital investments in their sample use voting restrictions at seed stage investments while only 25 per cent of the venture capital investments employ this control mechanism for funding late-staged projects. Lerner (1995) also finds that the number of venture capitalists on the board of directors significantly increases in situations where monitoring is most important, for example when the CEO of an enterprise is replaced. Also, there is a positive relationship between the R&D intensity and the number of venture capitalists representing in the board of directors.

Third, venture capitalists commonly have control rights that are disproportionate to their shareholdings. These control rights can be included in contracts between the venture capitalist and the entrepreneur, or they can be attached to the class of equity that the venture capitalist holds. Gompers (1998) finds that venture capitalists commonly have veto rights over the following decisions: (a) asset sales, (b) changes in control, (c) asset purchases, and (d) issuance of securities. The presence of these veto rights is unrelated to whether the venture capitalist has board control. In addition, Gompers (1998) also finds that veto rights tend to be greater in early-staged companies. Black and Gilson (1998) argue that the disproportionate allocation of control to the venture capitalist may play an additional role. The authors hypothesize that, since the entrepreneur derives private benefits from control, the initial transfer of control to venture capitalists is costly to the entrepreneur. Thus, the

opportunity to regain control at the time of IPO creates powerful non-monetary incentives for the entrepreneur to increase the value of the company. This contracting arrangement is analogous to a call option on control, which the entrepreneur can exercise when the company is successful enough to go public.

3.3.3.2 Cash-flow Allocation: the Use of Convertible Security

As a cash-flow oriented mechanism, the use of convertible security is popular in venture capital finance. In the sample of Kaplan and Per Stromberg (2003), more than 94 per cent of the venture capital-backed enterprises are financed with convertible preferred stocks. The systematic preference for convertible preferred stock is also noted in Sahlman (1990) and Gompers (1998). Furthermore, Kaplan and Per Stromberg (2003) also report that venture capitalists often employ a variant of convertible preferred stock called participating preferred. Explanations for the overwhelming use of convertible securities mainly focus on its function in allocating the cash flow rights between entrepreneurs and venture capitalists that addressing the entrepreneurs' compensation and some other incentive problems.

1. Entrepreneurs' compensation

Studies show that a very popular compensation mechanism utilized by venture capitalists is to have the entrepreneur and critical employees receive a substantial fraction of compensation in the form of equity or options in addition to the fixed salaries.

Researchers normally attribute the arrangement of entrepreneurs' compensation to moral hazard and adverse selection problems when there is severe asymmetric information distributed between the contracting parties. The traditional principal-agency theory pioneered by Holmstrom (1979) stresses that providing monetary incentives or cash flow rights to the entrepreneur is an optimal option. Based on this theory, Lazear (1986) shows that compensation contract also can be used as a screening device if the ability of the entrepreneur is uncertain. By setting the entrepreneur's compensation as an increasing function of performance, the venture capitalist discourages the entrepreneur of less capability from accepting the contract.

Empirical studies are largely consistent with the above theories. First, Baker and Gompers (2000) find that fixed salaries are lower and the size of the equity stake

held is higher for venture capital-backed chief executive officers, when compared to similar companies not financed by venture capital. Moreover, entrepreneurs of venture capital-backed enterprises usually accept smaller basic salaries compared to their income as dependent employees (Sahlman 1990), i.e. entrepreneurs give up a share of their safe income for their entrepreneurial activities. Furthermore, venture capitalists provide cash flow incentives to the entrepreneur depending upon the entrepreneur's performance and investment risks in practice (Kaplan and Per Stromberg, 2003).

2. Convertible security and other incentive problems

Other studies on the use of convertible securities in venture capital investment analyze the type of financing by comparing the pay-off of the enterprises under various contracts, such as equity, debt and convertible security contracts.

Cornelli and Yosha (2003) and Schmidt (1999) suggest that the intensive usage of convertible securities can be explained by the property of this financing type to endogenously allocate the cash-flow after the contract has been signed. The models predict that venture capitalists' conversion of convertible securities depends on the state of the portfolio projects. Combining both debt elements and equity elements with convertible security contracts, venture capitalists can claim on the enterprises' assets, as long as the shares are not converted in a bad state of the project. Or, they choose equity contracts while the project is in a good state. With this property, venture capitalists may enjoy the high level of returns from good projects whilst retaining the downside protection if the project does not do well. Empirical findings are consistent with the predictions. Gompers (1997) finds that, 92 per cent of the contracts specify an automatic conversion that occurs at the time of issuing initial offering of the venture capital-backed company. IPO is generally seen as the signal of the success of a venture capital-backed company. Moreover, the early-staged enterprises, in which the risk to lose the investment is highest (Ruhnka and Young 1987, 1991), are more often financed with convertible securities than enterprises at later stages (Gompers 1997, Kaplan and Per Stromberg, 2003). However, the models do not clearly explain the frequent use of combination of straight preferred stock, common equity and participating preferred stock that has been found in several empirical studies (Kaplan and Per Stromberg, 2003, 2004).

Furthermore, Cornelli and Yosha (2003) argue that the use of convertibles reduces the entrepreneur's incentive to engage in short-term earnings management. For example, when the venture capitalist stages the capital infusion, the entrepreneur may have the incentives to conduct 'window dressing' in order to assure subsequent financing. With convertible securities, this manipulation increases the likelihood that the venture capitalist converts the convertible securities into equity, thereby diluting the entrepreneur's claim. However, since venture capital contracts often comprise automatic conversion at the time of an initial public offering (Kaplan and Per Stromberg, 2003), the modelled uncertainty about the true performance at the time of conversion seems not plausible. Nonetheless, Hellmann (2002) gives more convincing explanation for the automatic conversion by suggesting that convertibles are an optimal solution to the trade-off between the need to allocate cash flow rights to venture capitalists and the need to make efficient exit decisions.

Another explanation of the prevailing usage of convertible preferred stock is offered by Gilson and Schizer (2002). The authors argue that firms that issue convertible preferred stock may lead more favourable tax treatment to the entrepreneur and other employees. Instead of being taxed at ordinary income rates, entrepreneurs and employees can defer taxation until the incentive compensation is sold, at which time a preferential tax rate is available. Gilson and Schizer (2002) suggest that the favourable tax treatment of such compensation is likely to be of first-order importance in the choice of this security type. Empirical works based on the US data prove that tax concerns indeed matter. However, there is no clear evidence for the level of importance of the feature (Gompers and Lerner, 1999a).

Even though researchers have explained many prevalent aspects of the use of convertibles, and empirical works show that it is widely employed in venture capital contracts in the United States, it is less clear whether it is an optimal arrangement under other institutional settings. Employing a novel dataset of venture financing in Canada, Cumming et al., (2002) report that the preference for convertible preferred does not extend to Canada. The findings suggest the need for further research on the choice of the convertible securities in different institutional settings.

3.3.4 VCs' Ex-post Monitoring and Value-added Activities

Moral hazard is a major concern for investors due to the separation of ownership and management in modern industrial firms. Theories of financial intermediation tend to focus on the monitoring role of intermediaries (Diamond, 1984). Researchers argue that venture capitalists are uniquely positioned to undertake ex-post monitoring activities because they have access to the detailed knowledge of their portfolio companies. The most widely used ex-post monitoring activity in venture capital investment is to stage the capital infusion. In addition, several studies confirm that venture capitalists serve such a role in their decision to liquidate or sell the firm and the decision to replace the CEO.

3.3.4.1 Stage Financing and Agency Costs

Empirical studies find that stage financing is extensively used in venture capital investment in the United States (Sahlman, 1990; Gompers, 1995). Normally, venture capitalists do not provide the capital needed by the entrepreneur in full upfront. Rather, they infuse the capital by instalments according to the performance of their portfolio companies. Usually, the two parties pre-set milestones as the performance measurements. As the most potent mechanism used in venture capital investment, stage financing needs many extra monitoring efforts and costs from venture capitalists. The opportunistic costs of time spending on evaluation, renegotiation and preparation for contracts, and the payments for legal and accounting fees etc. are considerably high. Sahlman's (1990) comprehensive work empirically demonstrates that venture capitalists visit and communicate with entrepreneurs more frequently than usual when they need to make the decision for the next round of financing.

Theorists give different interpretations for the intense usage of stage financing in venture capital investment. The rationales are mainly focused on the benefits of 'option to exit' retained by venture capitalists in terminating bad projects and mitigating agency problems. The majority of the literature emphasizes the relationship between the characteristics of the venture capital backed projects and the exertion of efforts on ex-post monitoring.

Primarily, theoretical studies rationalize stage financing from agency perspectives. As discussed, there are various agency problems involved in venture

capital investment. Researchers suggest that stage financing can effectively reduce agency problems. First, stage financing may serve as a ‘pay-for-performance’ mechanism since the next round of financing depends on the performance of the venture capital backed companies. Entrepreneurs thus need to exert efforts to achieve the pre-set milestones in order to gain the next round of capital (Cornelli and Yosha, 2003). Furthermore, drawing from ‘Stealing theory’ developed by Townsend (1979) and the ‘Hold-up model’ developed by Hart and Moore (1994), Neher’s model (1999) suggests that stage financing is helpful to control entrepreneur’s hold-up problems. The author attributes stage financing in venture capital investment to the lack of collaterals. According to the author, the human capital is embedded in physical assets of the venture with the growth of the company. He argues that the growing physical assets may serve as collaterals for investors for future investment. In a dynamic agency model, Bergemann and Hege (1998) emphasize the information learning through stage financing. The authors assume that the value of the venture project is initially uncertain to both the entrepreneur and the venture capitalists. More information can be revealed with the development of the project that may help the venture capitalist make better decisions.

Furthermore, researchers argue that stage financing may serve as a signalling mechanism. Lazear (1986) argues that good entrepreneurs may signal their capability by accepting a more performance sensitive compensation arrangement. At the same time, Dewatripont and Roland (1999) and Huang and Xu (1998) suggest that the option to abandon the venture can ultimately harden the budget constraints that investors commit not to provide further funding if the project is not satisfactory. In this way, the entrepreneurs with low-quality projects are deterred from seeking venture financing and hence screened out. This model is also related to the theories developed by Ross (1977) and Diamond (1991) that suggest the ability to liquidate can be used to screen for good entrepreneurs.

In addition, researchers also advise that stage financing may also serve as an ex-post screening mechanism and help venture capitalists to reduce transaction costs. Even though venture capitalists normally design sophisticated contracts to reduce potential agency problems, contracts can never be complete (Hart, 1995). There are risks and uncertainties out of control of both entrepreneurs and venture capitalists.

The ex-ante arrangements alone may not be enough to control the uncertainties. By staging the capital infusion, venture capitalists may terminate unsuccessful projects on time to minimize the loss (Cornelli and Yosha, 2003). Since venture capital investment normally does not require collaterals, timely termination is seen as important given the default liquidation value is low.

Even though stage financing has been rationalized by many theorists, empirical investigations are scarce. Gompers (1995) empirically examines stage financing from an agency perspective based on investment information of 794 venture capital backed companies in the United States. Taking the average industry ratio of tangible assets, R&D intensity, age and the development stage of the companies at the time of investment as major measurements for agency problems and uncertainties, the author shows that the more severe the potential agency problems are, the shorter are the staging intervals and the more frequently do venture capitalists reevaluate the company. In addition, the author also finds that the performance of the investment is positively correlated with the use of stage financing. It thus provides the evidence for the strength of stage financing in terminating bad projects. The other important empirical literature is the comprehensive studies of Kaplan and Per Stromberg (2003, 2004). Based on their analysis of the detailed investment theses of venture capital investments in the United States, the authors reveal that both internal risks (the agency problems) and external risks (risks and uncertainties that are not under the control of either the entrepreneur or venture capitalist) have relationship with the use of stage financing.

There are two major limitations with the existing literature on stage financing. First of all, the studies overlook the impact of incentive schemes provided by the venture capital funds to venture capitalists on stage financing arrangements. The existing literature mainly focuses on the relationship between stage financing arrangements and the potential agency problems associated with the venture capital backed projects. It is mainly based on an assumption that all venture capitalists may automatically exert enough efforts to control the agency costs and the uncertainties of their investments. However, as discussed, venture capital investment involves two sets of agency relationship, i.e. ultimate investors of venture capital funds-venture capitalists, and venture capitalists-entrepreneurs (Salmann, 1990, Cassamata,

2003). In the relationships, venture capitalists act as ‘principals’ to entrepreneurs on the one hand, and ‘agencies’ to the ultimate fund investors on the other hand. Alongside with this line, the incentive schemes provided by venture capital funds to venture capitalists may have an impact on how venture capitalists exert efforts in ex-post monitoring. However, to my knowledge, there is no discussion on stage financing from this strand yet. Secondly, the existing empirical evidence are based on examinations in the US market where the institutional environments for business activities are among the best and the governance structures of venture capital institutions are more homogeneous (e.g. over 80% of venture capital institutions in the United States are structured as limited partnership (NVCA). Stage financing outside the United States are not well documented and examined.

3.3.4.2 Other Ex-post Monitoring and Value-added Activities

According to the existing literature, venture capitalists also undertake some other monitoring and value-added activities in their venture financing. Studies mainly focus on the influence of venture capitalists on portfolio companies’ recruiting process, employment contracts, the replacement of CEOs and the commercialization of products, etc.

Gorman and Sahlman (1989) confirm that venture capitalists devote considerable time to oversee their portfolio companies, e.g. visiting them and reviewing their financial performance. Lerner (1995) finds that the probability that a firm can obtain venture capital financing is related to the geographic proximity of the firm to the venture capitalist. Furthermore, the likelihood that a venture capitalist will sit on a portfolio company’s board is closely related to the proximity. Specifically, there is a 47 per cent probability that a venture capital firm is located within five miles from the portfolio company will serve as a director, as compared to a 22 per cent probability for an investor 500 miles away. Bruton and Ahlstrom (2003) provide evidence that the geographic proximity is also matters in Asia.

Similarly, Kaplan and Per Stromberg (2003, 2004) find that the venture capitalist plays a primary role in shaping the top management team of the companies in which they invest. The authors also report that the monitoring activities of venture capitalists are closely related to their pre-investment appraisal and the structure of the financial contracts. Furthermore, Hellmann (1998) predicts that venture capitalists

have stronger incentives to attract professional managers than entrepreneurs do. The results of Hellman's model show that under reasonably common conditions, an entrepreneur will agree ex-ante to cede to a venture capitalist control over future decisions to hire a new CEO. Empirical evidence on the outcomes of this trade-off is mixed. Hellmann and Puri (2002) find that a venture capital backed firm is twice likely to replace its CEO with a non-founder than a firm without venture capital. However, Baker and Gompers (2000) find no significant relationship between venture capital financing and the likelihood of the takeover of CEOs.

Besides, researchers suggest that venture capitalists also help entrepreneurs to raise additional funds by certifying the quality of a start-up company. Megginson and Weiss (1991) hypothesize that venture capitalists certify the value of venture capital backed companies in an initial public offering. They argue that venture capitalists are repeat players in the IPO market, their success allows them to establish profitable follow-on funds, and entrepreneurs give up substantial equity stakes to venture capitalists in exchange for relatively small capital infusions. Consistent with the valuable certification, the authors find that venture capital backed IPOs exhibit lower underpricing and lower underwriter spreads than a matched set of non-VC-backed IPOs. However, Lee and Wahal (2002), using more sophisticated econometric techniques to control for endogeneity, find that venture capital backed IPOs exhibit greater underpricing, particularly during the internet boom of the late 1990s. They conclude that their findings are inconsistent with the certification hypothesis.

In addition, studies show that venture capital backed companies perform better in R&D activities. Kortum and Lerner (2000) estimate that one dollar of venture capital produces three times more patents than one dollar of traditional corporate R&D investment in the United States. Moreover, Hellmann and Puri (2000) find that innovator (as opposed to imitator) firms are more likely to be financed by venture capitalists. At the same time, firms financed by venture capital tend to bring their products to market more quickly. These findings are consistent with the view that the expertise of venture capitalists gives them a comparative advantage in identifying valuable innovations and assisting the companies in bringing their product to market.

To summarize, the literature shows that venture capitalists provide many benefits to entrepreneurial companies that are not normally offered by traditional financial intermediaries. Of course, these benefits are not costless to entrepreneurs. The close involvement of venture capitalists can be time consuming for both parties. More importantly, venture financing is associated with a significant reduction in the entrepreneur's decision-making and control rights. Finally, venture capitalists tend to demand higher rates of return for their investments compared with other private equity investors (Sahlman, 1990). This makes venture capital a relatively expensive source of financing. These costs must be traded off against the benefits of venture capital financing.

3.3.5 Syndication of the Venture Investment

Syndication of investment is also a popular mechanism used in venture capital investment. According to Sorenson and Stuart's (2001) survey of the US venture capital market, over two thirds of 7590 venture capital backed firms in his data are financed by more than one venture capital firms. Researchers suggest that similar to other mechanisms, syndication also addresses agency problems and uncertainties inherent in the relationship between the venture capitalist and the entrepreneur. Currently, studies in this area mainly focus on rationales to syndicate investments and benefits of syndication. Researchers explain the motives for syndication from various aspects including financial concerns, resources sharing requirements, and social networking expansions.

3.3.5.1 Financial Motives for Syndication

Studies on financial motives for syndication mainly emphasize reducing risks by diversifying portfolios. According to the traditional financial theory, rational investors diversify their portfolios to reduce idiosyncratic risks and to make their portfolios more efficient (Markowitz, 1952; Wilson, 1968). However, venture capital investment is private equity investment. It is not easy for venture capitalists to diversify portfolios because normally venture capital funds are smaller than mutual funds and venture capital investment has poor liquidity since it is private equity investment. Researchers suggest that in order to gain an optimal level of portfolio diversification with limited amount of funds, venture capitalists choose to syndicate with each other. Bygrave (1988) provides evidence for this argument with a survey

in the United States. Furthermore, examining five European countries, Manigart et al., (2003) show the same results. However, the findings are quite plausible since they fail to explain why venture capitalists syndicate frequently even if the financial value at risk is low and they do not have visible financial constraints (Bygrave, 1987; Brander et al., 1999).

3.3.5.2 Resource Sharing Perspectives

The other explanation for syndicated financing focuses on the value of resource sharing among different venture capitalists. Researchers suggest that venture capitalists may share information and expertise to gain more access to potential deals, improve ex-ante decision-making, provide more value-added assistance to entrepreneurs and increase capability in monitoring portfolios by syndicating.

Based on resource sharing perspectives, Sah and Stiglitz (1986) suggest that the problems of adverse selection during the deal selection will be mitigated by syndicating finance. The authors state that if several independent investors first check each other's willingness to invest in a potentially promising firm and then jointly invest in it, the selection they make may be superior to a decision based on only one decision-maker. Such a hierarchical or at least partly hierarchical decision-making mechanism reduces the risk of selecting inferior companies in the portfolio. Lerner (1994) supports this decision-making improvement opinion with his empirical findings that in first round investments established venture capital firms syndicate with one another, and in later rounds with less established organizations. Also, Bygrave (1987) and Kaplan and Per Stromberg (2003) find that venture capitalists tend to syndicate when the investment-related information is highly asymmetric.

Furthermore, the improvement of adding value may also motivate syndication (Bygrave, 1987; Brander et al., 1999). The venture capitalist plays a much more active role in managing their investments than public market investors (Gorman and Sahlman, 1989; Hellman and Puri, 2000; 2002). From the resource-based perspective, syndication allows venture capitalists to add more value to the investments without the need to accumulate specialized resources for a long time (George et al., 2000). Venture capitalists have heterogeneous skills, information and networks. They may add value to the target firm in complementary ways. The existing research suggests

that this reason dominates others as motives for syndication (Brander et al., 1999; Lerner, 1994; Manigart et al., 2003). However, syndication does not ensure superior value added. Hold-up and free-rider problems may emerge after the syndicated investment has been made (Dewatripont and Maskin, 1990; Bolton and Scharfstein, 1990). How venture capitalists deal with the problems and balance the benefits and the costs of syndicated financing need more investigations.

3.3.5.3 Window Dressing Perspectives

Lerner (1994) further discusses the motives of syndication based on financial concerns from another aspect: 'window dressing'. The author suggests that in order to raise a new fund after closing the previous one, venture capitalists normally have to be able to demonstrate a good track record of the past performance. Hence, venture capital firms may be tempted to enter deals that have proved to have a good chance of providing a successful exit in the future. As a result, venture capitalists may want to invest in later-staged deals which have been invested by other venture capitalists. Such investments allow venture capital firms to associate themselves with the potential success stories of these investments. Normally venture capitalists have to syndicate their investments at relatively high prices. However, even if the 'window dressing' hypothesis may partly explain syndicated investments in late-staged projects, it fails to explain syndication activities in the case of early-stage investments.

3.3.5.4 The Social Structure Perspectives

Sociological studies suggest that there are some social reasons for syndication in venture capital investment. Sorenson and Stuart (2001) examine syndication and the spatial distribution of US venture capital investments. They find that while venture capitalists in general are focused geographically and industry-wise, syndication networks diffuse information across these boundaries, and expand the spatial radius of exchange. Venture capitalists in a syndication network invest more frequently in spatially distant companies. The authors suggest that the structure of networks affects both the flow of information and the propensity to syndicate investments. This opinion is also supported by some other empirical studies which show that venture capitalists form tightly coupled syndication networks and that

syndication relationships are often repetitive and reciprocal (Bygrave, 1987; 1988; Lerner, 1994).

3.4 Institutions and Venture Capital Investment

New institutional economics has been widely employed by economists for its broadness in understanding and explaining economic phenomena. The central argument of new institutional economics is that the institutional framework of a society provides formal rules regulating economic activities and hence influencing human beings' beliefs, goals, and behaviours. In this way, institutions produce a structure to reduce uncertainties in daily life (North, 1990) and govern the relationships between individuals and organizations (Williamson, 1991). Researchers suggest that new institutional economics provides an appropriate framework in studies on venture capital markets, especially in cross-country comparison (Black and Gilson, 1998; Mayer et al., 2005). Primarily, venture capital investment encounters more serious agency problems and higher transaction costs, which are the central research issues of new institutional economics. Furthermore, the development of venture capital investment itself is path-dependent to and embedded in institutional environments. The evolving trajectory of venture capital investment in the US shows that venture capital investment emerged from the dynamics of institutional changes in the country (Lerner, 2000; Kenney, 1989). The existing literature therefore focuses on how institutions interact with the development of venture capital industry on a macro level (Black and Gilson, 1998; Jeng and Wells, 2000) and the business behaviours of the practitioners on a micro level (Kaplan and Per Stromberg, 2004; Cummings, 2003; Lerner and Schoar, 2005; Bruton and Ahlstrom, 2003).

3.4.1 *New Institutional Economics*

According to new institutional economics, institutions exist due to the uncertainties involved in human interactions. Institutional frameworks comprised of a set of political, social, cultural and legal ground rules form the basis for production, exchange, and distribution in a society, with the aim to establish an optimal system and provide incentives to actors in the social economy (North, 1990). Institutional development may lead to a path-dependent pattern of development (North, 1990). Therefore, institutions vary widely in their consequences for economic performance.

There are two major perspectives in new institutional economics. The first focuses on institutional environments, which refers to the background constraints or 'rule of the game' that guide individual behaviours. These institutions can be formal, explicit rules, such as constitutions, laws, and property rights, or informal, implicit rules, such as social conventions and norms (Davis and North, 1971; North, 1990). Researchers categorize institutions as normative, regulatory, and cognitive (DiMaggio and Powell, 1991; Zucker, 1991). The most formal ones are regulatory institutions, representing standards provided by laws and other sanctions. Normative institutions are less formal. They normally define expected roles or actions and are often manifested through accepted authority systems. Cognitive institutions represent the most informal, taken-for-granted rules and beliefs that are established among individuals through social interactions among various participants.

Among these sets of rules, legal environments have attracted the most attention. Particularly, researchers are most interested in the efficiency of common law (Priest, 1977), contract law (Macneil, 1974), and property law (Alchian, 1965; Demsetz, 1967; Cheung, 1970) to constrain individuals' behaviours and reduce uncertainty. North (1991) argues that economic development is a response to the evolution of institutions that support social and commercial relationships. Economic growth thus depends on the degree to which the potential hazards of trade can be controlled by institutions. Along with this line, researchers suggest that the growth of product markets depends on establishing secure protection of property rights and strong enforcement of laws (North, 1990). Empirically, studies provide evidence that the divergence in financial and legal systems is the major factor to explain the corporate performance and business behaviors across countries (La Porta et al., 1997, 1998; Allen and Gale, 1999; Rajan and Zingales; 2003). Besides, informal rules defined by codes of conduct, norms of behaviours and conventions are also important institutional environments. Some researchers argue that social norms and conventions can be superior to administrative and judicial disputes resolution among people with close social ties and repeated business partners (Scooter, 1981; Ellickson, 1991).

The other perspective in new institutional economics emphasizes institutional arrangements that are the agreements made by specific individuals to govern their

own relationships. Business firms, long-term contracts, public bureaucracies, organizational structures, and other contractual agreements are examples of institutional arrangements. The boundary of firms is the major concern of the institutional arrangement approach. New institutional economics views a firm as a set of arrangements. Differing from neoclassical economic theory that suggests a firm is a production function or production possibility that transforms inputs into outputs, firm theory explains that the boundary of a firm not only depends on the productive technology but also on the various costs involved in the business exchange (Coase, 1937). It is suggested that the decision to organize transactions within the firm or on the open market depends on the relative costs of the internal and external exchanges (Williamson, 1979; Crawford and Alchian, 1978; Grossman and Hart, 1986; Hart and Moore, 1990). Therefore, the core issue of firm theory is how to reduce costs under different circumstances.

Firm theory comprises several approaches, among which agency theory, transaction cost economics, and the property right approach are the best developed. Agency theory emphasizes the moral hazard problems that result from the separation of ownership and control in large firms (Berle and Means, 1932). Based on the assumption of self-interest, the authors suggest that managers use their discretion to shirk or pursue personal objectives at the expense of shareholder value. Agency theory thus studies the design of ex-ante incentive-compatible mechanism to reduce agency costs (Jensen and Meckling, 1976; Fama, 1980; Jensen, 1986). Agency costs refer to the sum of monitoring expenditures of the principal, the bonding expenditures of the agent, and the residual loss. According to agency theory, a firm is a nexus of contracting relationships; thus, the question of interest is the degree to which various contracts mitigate these conflicts.

Transaction cost and property right approaches criticize agency theory by pointing out that contracts are not able to solve all of the problems associated with exchanges. Researchers suggest that contracts are not complete in reality, because human beings' rationality is bounded (Simon, 1979); outcomes of contracts are either unobservable (Holmstrom and Milgrom, 1987) or unverifiable (Hart, 1988). Contract difficulties are even more serious under weak institutional environments. Even when the contract is relatively complete, it is difficult to enforce under the weak protection

of property rights and law enforcement (Hart and Moore, 1990; Williamson, 1996). This incompleteness of contracts leads to various risks among which the hold-up problems associated with asset-specific investments is the best-known (Hart, 1995). Therefore, transaction cost and property right approaches suggest that appropriate governance structures must protect the transacting parties from risks (Williamson, 1985; Grossman and Hart, 1986).

Governance structures are normally divided into decentralized market structures (buy) and hierarchical structures (make). Researchers argue that under a market structure framework, transactions are dealt through the market system. Market prices provide strong incentives for exploiting profit opportunities, and actors are quick to adapt to changing circumstances as information is revealed through prices. However, when relationship-specific assets are at stake, a bilateral coordination of investment decisions may be desirable, and a combined ownership of these assets may be efficient (Milgrom and Robert, 1992; Holmstrom, 1992; Shleifer, 1985).

Hierarchical structures refer to integrated firms, where trading parties are under unified ownership and control. Researchers argue that such hierarchies offer greater protections for specific investments and provide relatively efficient mechanisms for responding to changes where a coordinated adaptation is necessary. Compared with decentralized structures, however, hierarchies provide managers with weaker incentives to maximize profits and normally incur additional bureaucratic costs (Milgrom and Roberts, 1990). The movement from market to hierarchy thus entails a trade-off between high-powered incentives with the adaptive properties of markets and lower-powered incentives with central coordinating properties of the firm.

Although the organizing scheme of institutions is not without controversy, the institutional arrangement approach has been proven helpful for analytical purposes in many fields. Studies mainly focus on the relationship between a certain organizational form and the transaction costs, including the asset specificity, the uncertainty, the complexity and the frequency of the transaction (Monteverde and Teece, 1982; Williamson, 1985). Long-term contracts and partial ownership or

equity are also examined as alternative integrating arrangements (Goldberg and Erickson, 1987; Pisano, 1990).

3.4.2 Legal Institutions and Venture Capital Investment

The interaction between legal institutions and individual business performance and behaviours has attracted intensive interests from researchers in finance. Following La Porta et al. (1997, 1998, and 2000), King and Lavine (1993) and Rajan and Zingales (2003) demonstrate that legal systems are important in understanding and explaining economic activities and financial systems. In the case of venture capital investment, studies examine the impact of legal systems on the growth of venture capital markets and venture capitalists' investment activities from both contractual and non-contractual aspects.

Kaplan et al. (2003) analyze how financial contracts allocate cash flow, board seats, liquidation, and other control rights under different legal systems. Examining 145 venture capital contracts in 23 developed countries and comparing them to those in the United States, the authors find that venture capital contracts differ across legal regimes. In particular, investments in common law countries are more likely to look like the US contracts while investments elsewhere are likely to differ. However, the authors also find that legal systems cannot explain all the differences. According to their examination, more experienced venture capitalists implement US style contracts regardless of the legal regime. Thus, the authors draw the conclusion that the fixed costs of learning appear to explain contracts along a wide range of legal regimes.

Bottazzi et al. (2004) also examine how the contractual relationship between a venture capitalist and an entrepreneur depends on the legal system, but from both contractual and non-contractual aspects based on a hand-collected dataset consisting of 1457 deals made by 121 venture capital firms in 15 European countries for the period 1998-2001. The researchers find that better legal systems tend to be associated with more venture capitalists' governance and more downside protection for the investors. Additionally, using the information from investments that cross legal system boundaries, they find that investors from stronger legal traditions provide more support, exercise more governance, and demand more downside protection, both within and outside their legal system.

While both the above studies are based on developed countries, Cumming et al. (2004) examines the impact of legal systems on the governance of venture capital investment in both developed countries and developing countries. With a dataset on 3848 venture capital backed companies in 39 countries from North and South America, Europe and Asia spanning 1971-2003, the authors find that better laws facilitate faster deal screening and deal origination, a higher probability of syndication and a lower probability of potentially harmful co-investment, and facilitate board representation of the investor. They also show better laws reduce the probability that the investor requires periodic cash flows prior to exit, which is in conjunction with an increased probability of investment in high-technology companies. All the studies provide evidence that stronger law protection leads to more formal and innovative tools for venture capitalist to control and provide incentives to entrepreneurs.

Furthermore, according to theoretical works, countries with inferior investor protection will have less developed markets for new venture financing (King and Lavine, 1993; Rajan and Zingales, 2003). Therefore, a hypothesis may be made that countries with more investor protection might have more developed venture capital market that support more innovative hi-tech projects. However, according to Obrimah's (2004) empirical analysis, the property right protection and the enforcement of contracts do not always impact on the supply and demand sides of venture capital markets. The author finds that that the quality of the contract enforcement is a risk factor, while the quality of property rights protection is not. The quality of contract enforcement affects the supply of entrepreneurs who are willing to invest in the creation of intangible assets. Meanwhile, the poor quality of property right protection only affects the demand for growth financing, with supply unaffected.

3.4.3 Capital Market and Venture Capital Investment

Black and Gilson (1998) argue that the venture financing market is strongly linked with the stock market in a country. The authors suggest that venture capital market can flourish only if there is also an active stock market. First, financing contracts between entrepreneurs and venture capitalists typically allow entrepreneurs to reacquire control from venture capitalists at the time of IPO. Second, an IPO provides venture capitalists with the opportunity to exit their investment and return

capital to the investors of the funds. Therefore, the authors make the prediction that countries with well-developed stock markets, such as the United States and the United Kingdom tend to have venture capital commitments that are higher as a percentage of GDP than do countries with less stable stock markets, such as Japan and Germany.

Drawing from Black and Gilson (1998), Jeng and Wells (2000) analyze the determinants of venture capital development for a sample of 21 countries and find that IPOs are the strongest driver. In particular, IPOs are a significant determinant of late stage investments while have no effect on early stage investments across countries. Similarly, Milhaupt (1997) compares the different institutional environments for venture capital in the United States and Japan. He shows that US venture capital firms are larger, more independent than Japanese ones do. Moreover, they normally take larger equity stakes, invest more in early-staged projects and new technologies, and, are more involved in the governance of their portfolio companies than their peers in Japan. The author suggests the US market-based system increases both the supply of venture funds and the demand for venture financing relative to a bank-centred system as found in Japan.

3.4.4 Taxation and Venture Capital Investment

Tax policy also has an impact on venture capital activity either by affecting the supply of funds or by affecting the incentives of individuals to become entrepreneurs. Poterba (1989) analyzes the link between capital gains taxation and venture capital activities. He argues that the supply of funds is unlikely to be greatly affected by lower taxes because more than half of venture investors are tax-exempt. However, he shows that lower capital gains taxes might increase the demand for venture capital by increasing the incentive of individuals to pursue entrepreneurial ventures. Consistent with Poterba's (1989) analysis, Gompers and Lerner (1999) provide empirical evidence that lower capital gains tax rates are followed by larger amounts of venture capital fundraising. Because this increased fundraising comes from both taxable and tax-exempt investors, the authors suggest that the effect of capital gains taxes stems from its impact on the supply of entrepreneurs.

Based on an analysis of R&D financing, Hall (2002) generalizes a model, which systemically explain how taxation impacts on the development of venture

capital investment. Comparing the costs of capital for early stage investment in hi-technology under different assumptions of taxation systems, this model shows that venture financing is relatively more expensive for R&D projects than for ordinary investment, and that the consideration such as the lack of collaterals further reduces the possibility of debt finance. So, reducing capital gain tax might be a helpful solution to encourage venture capital investment in newly established R&D-oriented companies.

3.4.5 Social Norm/Culture and Venture Capital Investment

Besides legal and financial systems and taxation policies, researchers suggest that social norms might also influence venture capital investing (Wright, 1992; Bruno and Tyebjee, 1986; Bruton and Ahlstrom, 2003; Wang, 2002). Bruton and Ahlstrom (2003) examine how institutional arrangements impact venture capital investment practices in China. Based on 36 interviews within 24 venture capital firms that are active in China, the authors find the screening criteria and due diligence activities of venture capitalists in China are different from those in the United States. Fewer monitoring and value-added activities are provided by venture capitalists in China than their peers in the United States. The researchers suggest that various institutional elements including regulatory, normative and cognitive arrangement may exert influences while the less formal cognitive institutional elements such as ‘*Guanxi*’ (relationship) ‘*Mianzi*’ (face) etc. may play stronger roles in characterizing venture capitalists’ activities in China. Bruton et al. (2003) also gain the similar results from their studies on venture capital investment in East Asia.

In addition, Manigart et al. (2003) and Locket and Wright (2001) examine venture capitalists’ investment activities in European countries in terms of their project evaluation, syndication, and some other controlling mechanisms. The authors find that, venture capitalists in Europe act more like their US counterparts though differences indeed exist across countries. For example, venture capitalists in France and Belgium emphasize more on informal information for projects than those in the United Kingdom. The authors attribute the results with more emphasis on the influences of social norms and cultures.

3.5 Limitations of the Existing Studies

Reviewing the existing literature on venture capital investment, it can be seen that there are some important unanswered questions left for further studies in risk return of venture capital investment, venture capital investment under institutions outside the United States, and, also, the essential mechanisms employed in venture capital investment.

3.5.1 Limitations of Studies on Venture Capital Investment Mechanisms

As shown in previous sections, even though the mechanisms used in venture capital investment in the United States have been extensively discussed both theoretically and empirically, there are many unresolved questions on the way to fully understanding venture capital finance.

Primarily, empirical examinations on the ‘double-sided’ moral hazard problems in venture capital investment are scarce in the existing literature. Previous studies are either interested in discussing the incentive mechanisms in the ‘fund investor-venture capitalist’ relationship or the ‘venture capitalist-entrepreneur’ relationship. How the incentives provided by venture capital funds to investment professionals may impact on the venture capitalist’s investment strategies is seldom tested. Almost all studies confirm that venture capitalists are the key in venture financing that bridge the other two stakeholders, i.e. the investors of venture funds and the entrepreneurs. The efforts exerted by venture capitalists in selecting and governing their portfolio companies should be critically important for the success of venture investment (Cassmata, 2003, Schmidt, 2003). Therefore, the mechanisms to solve the incentive problems between venture capitalists and the investors of venture funds should have impacts on investing activities and the performance of the investment.

Limited partnership as an organizational structure is widely employed by venture capital institutions as a privileged mechanism to deal with the incentive problems between fund investors and venture capitalists. However, there is little empirical research on the comparison of this arrangement with other organizational structures of venture funds and the relationship between this arrangement and the performance of the venture funds. Moreover, there is even little study on the

interaction of this arrangement of limited partnership with venture capitalists' investing activities.

Furthermore, there are also limitations in empirical studies on mechanisms used by venture capitalists to solve the agency problems in their selecting and managing the portfolio companies. Primarily, empirical study on stage financing is scarce. As the most potent mechanism used in venture capital investment, stage financing has been discussed extensively by theorists. However, empirical investigations are rare and, the few studies are all based on the US data. Moreover, most existing studies discuss the mechanisms separately rather than considering the interactive relationships and interwoven effects of the mechanisms in venture capital investment. For example, the use of convertible security, stage financing and syndicated financing are all considered as important mechanisms used in venture capital investment. The mechanisms are often used simultaneously. Some theorists suggest that the use of the various mechanisms may have relationships between each other. For example, Conelli and Yosha (2003) argue that the use of convertible security in venture capital investment may help to reduce the 'short-termism' of entrepreneurs in stage financing. At the same time, Huang and Xu (1998) suggest that syndication of investment may act as a commitment device for venture capitalists to terminate bad projects through stage financing on time. The studies remind us of further empirical examinations on the interwoven effects of the various mechanisms used in venture capital investment.

3.5.2 Limitations of Studies on the Effects of Venture Capital Investment

Although previous studies implicitly suggest that venture capital may be especially important for innovative companies, they devote only modest attention, however, to concern about the causality: the possibility remains that more innovative firms select venture capital for financing, rather than venture capital causing firms to be more innovative. As referred to Lerner (2001), policymakers have a perception that venture capital organizations have much to do with the rising leadership of US companies in high-technology industries (which can be measured through patent counts or more qualitative measures). But demonstrating a causal relationship between the presence of venture capital investment and innovation or job growth is a

challenging empirical problem. Most of the existing literature fails to control the endogenous alternatives for the effects of venture capital investments on innovation.

Furthermore, studies on the factors that influence on venture capitalists' capability to support entrepreneurial R&D activities and innovations are also limited. As stated, studies show that there are substantial variations in the distribution of venture capital investment. However, systematic studies on what affect venture capitalists' investment focuses, especially those outside the US, are scarce.

Finally, little work has been done on analyzing the risk and return characteristics of venture capital investment. Unlike publicly traded companies, private firms are not subject to rigorous disclosure requirements. Thus, it is hard to gain accurate data concerning the rate of return of venture capital investment before the venture capital backed firms go public. The existing literature that estimates the risk return of venture capital investment mainly takes IPOs of venture capital backed companies as the measurement of success. However, Cochrane (2001) and Gompers and Lerner (2001) point out that this might create a sample selection bias in that only the better performed companies choose to go public whereas a substantial number of companies elect to remain private. So, it is less clear whether the returns of venture capital investments are different from those of public equity. If so, an argument may be made that whether these differences can compensate the lack of diversification and severe informational asymmetries faced by venture capitalists, and the costs of value added and monitoring activities venture capitalists provide.

To summarize, although much efforts have been exerted to measure the economic effects of venture capital investment, the knowledge remains incomplete. Currently, policymakers around the world make many efforts to promote venture capital programs in order to boost R&D financing and national innovation in their countries. It is therefore emerged as a very important question to assess the risk return of venture capital financing and, to what extent venture capital supports young R&D-oriented companies under various institutions in different countries.

3.5.3 Limitations of Studies on Venture Capital Investment outside the US

As discussed, there has been a surge in venture capital investment in a wide variety of nations across Asia, Europe, and Latin America since the 1980s. However, most of the studies mentioned in foregoing sections are based on the US market. Due

to the short history and the lack of data, examinations on venture capital industry outside the United States are still limited. Research on European venture capital markets started in the 1990s whilst studies on Asian venture capital just started in the second half of the 1990s. Recently, researchers examine how intuitions influence the growth of venture capital markets and shape venture capitalists' investment and governing activities in different countries (Cumming and MacIntosh, 2003; Gilson and Black, 1998; Jeng and Wells, 2003; Bruton et al., 2003). However, most of the studies are based on theories that are generated from the observations in developed countries. It is questionable whether the indicators and measurements derived from the existing theories are suitable in understanding and examining venture capital investment in developing economies where the institutions are different from those in developed countries in many aspects.

3.5.4 Knowledge Gaps in China's Venture Capital Investment

Studies on venture capital investment and entrepreneurship in China did not begin until the years 2000 due to the short history and lack of data. There are many questions left unanswered.

White et al. (2002) are among the first researchers discussing venture capital investment in China. The authors document the institutional and policy trajectories of China's venture capital industry before the year 2000. Bruton and Ahlstrom (2003) explore how foreign venture capitalists (FVCs) invest in China under an institutional framework. This study is a qualitative research based on interviews with practitioners. The authors find that both formal and informal institutional settings affect FVCs' investment behaviours in China. However, the degree of the impacts is not homogeneous. For example, the researchers find that regulatory and cognitive institutions impact nearly all aspects of foreign venture capitalists' investing activities in China, but normative institutions only matter in the project screening. Similarly, Feng (2004) analyzes the impact of institutional dynamics on the evolution of China's venture capital industry with the focus on the changes of FVCs' investment strategies in China. Based on interviews and secondary document analysis, Feng finds that the protection of property rights has a dominant impact on investing behaviour whereas the agency perspective is not as powerful in explaining FVCs' investment strategies in China.

There is no doubt that such studies have improved our understanding of venture capital investment in China. However, knowledge gaps remain due to the scarcity of the research. Questions like whether venture capital investment indeed supports young R&D-oriented companies; how the structure of venture capital institutions interacts with venture capitalists' investing activities in China; and how institutions, especially regulatory institutions, impact venture capitalists' financial contracting are left unanswered. Furthermore, the existing studies only look at foreign venture capitalists' investing activities; the sample cannot represent the whole group of venture capitalists in China so far. Finally, these studies are mainly conducted based on the qualitative approach, which leads to inevitable weaknesses in validating the findings.

To summarize, although venture capital industry in China has remarkably developed in the past years, studies on venture capital investment in China remain extremely immature. The lack of investigation is shown in both the content of the research and the methodology used in the existing literature.

3.6 Research Question Statement

From the above survey of the existing literature, it is seen that there are many aspects of venture capital investment remain uncovered. The lack of scrutiny is especially seen in venture capital investment outside the US. This study therefore tries to fill some of the knowledge gaps by exploring and examining venture capital investment in China under an institutional framework.

Primarily, new institutional economics provides an appropriate framework for exploring and examining venture capital investment in China. Above all, as stated, new institutional economics provides a deeper understanding of the mechanisms employed in venture capital investment. As previously discussed, the central concern of new institutional economics is how institutions may control agency problems and uncertainties in transactions. While agency problems and uncertainties are more severe in venture capital investment, institutions might be more powerful to explain how venture capital investment stands out from traditional financial means in dealing with the agency problems and uncertainties. For example, researchers argue that equity arrangement is more efficient in investment in R&D-oriented projects (Armour and Teece, 1980; Joskow, 1985; Pisano, 1990) that is consistent with the

practice of venture capital investment. Furthermore, the development of venture capital investment itself is path-dependent to and embedded in institutional environments. The evolving trajectory of venture capital investment in the US shows that venture capital investment emerged from the dynamics of institutional changes in the country (Lerner, 2000; Kenney, 1989).

Moreover, the new institutional perspective is even more important to understand China specifically. As a transitional economy with the largest population and longest history, China has a unique economic structure, political system, legal system, and diverse culture. Researchers argue that the differences in institutional environments may influence the behaviour of actors in China's economy on the one hand, and the reflection of the actors then influences changes in institutional environments on the other hand (Lieberthal and Oksenberg, 1988; Pistor and Xu, 2005).

China is different from western countries due to the socialism legacy. In particular, the political and legal framework under which the country has created significant economic growth differs from many other developed or developing countries (Qian and Xu, 1993; Jin et al., 1999). Before the economic reform, China was under a central planning system. Administrative bureaucracy was the only regulatory institution to solve business disputes and govern the State-owned Enterprises (SOEs) that composed the absolute majority of the country's economy at that time. The legal system that regulates business practices almost did not exist, especially during the twenty years following the political turmoil of the 1950s. Even though the government has made substantial efforts to improve the legal and financial systems to during the transformation from the centrally planned economy to a more market-oriented economy since the late 1970s, the institutional environments are far from developed due to the short history of the legal system construction and the legacy of the political system in the country (Allen et al, 2005). Currently, the country is still criticized for its lack of a comprehensive legal system, weak protection of property rights, and problematic law enforcement. The governance structure and the effectiveness of the government in China are also major concerns.

Normative institutions are also unique in China. First, due to the legacy of the central planning system, the country has long lacked social infrastructure serving the

market economy. For example, professional managers are scarce in China; intermediary and consultancy are still immature compared to developed countries. Cognitive institutions such as social norms, culture, and customs are considered one of the most important factors influencing on business behaviours in China. Networking (Guanxi), face value (Mianzi), and excessive concern for family (Jiating Guannian), which are all rooted in Confucianism, carry much weight in Chinese society (Ford, 1997; Graham and Lam, 2003).

To summarize, the nature of venture capital investment and the uniqueness of China in institutions suggest that new institutional economics provides an appropriate platform for exploring and understanding venture capital in China. However, although scholars have recognized the importance of China in the global economy and the impact of institutions on its development, there are few empirical studies focusing on the role of different institutional environments in China's economy and how these differences can help create different organizational and commercial systems (Allen et al., 2005; Peng, 2001; Pistor and Xu, 2005), especially in the R&D financing and entrepreneurial domains. This study therefore tried to fill up the knowledge gaps by exploring and examining institutions of venture capital investment and the impact of the institutions on venture capitalists' investment strategies.

The overall institutional environments and institutional arrangements related to venture capital investment are first discussed with a detailed introduction on the trajectory of China's venture capital industry in the past twenty years. It explores the overall legal and financial systems, public policies and social norms under which venture capital investment operates on the one hand, and, the governance structures of the individual venture capital funds on the other hand.

This study then examines whether these institutions affect VCs' investment strategies in China; and, if the answer is yes, how these institutions impact VCs' investment in China. The impacts of institutions on VCs' investment activities are examined through three aspects: i.e. VCs' investment preferences in terms of the technology and development stage of their portfolio companies, VCs' ex-ante project screening criteria and VCs' stage financing strategies.

Examining venture capitalists' investment preferences in terms of the development stage and R&D intensity of the portfolios, this study explores whether venture capitalists in China indeed support young high-technology companies as the policymakers and researchers asserted; and, how institutions impact VCs' capability to support the young R&D-oriented companies. After that, VCs' ex-ante screening strategies are explored. It discovers what factors are considered as important for venture capitalists in their project screening in China. By comparing the screening criteria used in China with those of developed countries, this study examines how the unique institutions in China impact VCs' ex-ante screening. Finally, VCs' ex-post monitoring activities are investigated with the focus on stage financing. It explores the relationship between agency problems associated with the investment and VCs' stage financing strategies in China. By comparing VCs' stage financing structure in China with those in the US, it tried to explore whether and how institutions impact on VCs' ex-post monitoring activities in China.

By addressing the above questions, this study provides an empirical exploration and analysis on institutions of venture capital investment and VCs' investment strategies in China. It is among the first empirical studies exploring venture capital investment in China. It is also among the first attempts examining the interaction between institutions and investment activities in developing countries.

3.7 Summary

This chapter reviews the existing literature on venture capital investment with the focus on agency and institutional issues associated with this innovative financial form. The existing studies suggest that the two agency relationships: i.e. the agency relationship between the ultimate investors of venture funds and venture capitalists; and, the agency relationship between venture capitalists and entrepreneurs are the major concerns of practitioners in venture financing. Nearly all the mechanisms employed in venture capital investment deal with these two sets of agency problems. At the same time, studies also show that institutions, especially legal and financial institutions are important factors to explain and the development of different venture capital markets and individual investment strategies of the practitioners.

Although the existing literature has substantially improved our understandings in venture capital investment, many questions remain unanswered.

The lack of scrutiny is especially seen with the systematic analysis on the economic effects of venture capital investment, the interaction of mechanism employed in venture capital investment and, the venture capital markets in emerging markets etc.

Based on the review of the existing literature, the research questions for this study are further clarified. This study tried to fill the knowledge gaps by exploring and examining venture capital investment in China under an institutional framework. The institutions under which venture capital investment operates in China, and, the interactions between VCs' investment strategies and these institutions are the focuses of the discussion.

In summary, this study contributes to the existing literature by providing empirical evidence on how venture capital funds are governed and how venture capitalists manage their investments under the special institutions in China. In the next chapter, the methodological issues, which instruct how the research goals of this study are achieved, are discussed.

Chapter 4 Methodological Justification

4.1 Introduction

This chapter discusses the methodological issues of this study. The nature of this research and the pragmatic considerations of the researcher suggest that a ‘triangulation’ methodology, which combines both qualitative and quantitative approaches, is appropriate for this study. Consequently, a multi-phased research design that covers various data collection and analysis methods was chosen to fulfil the research objectives in this study. Unstructured and semi-structured interviews with venture capitalists, entrepreneurs, government official and researchers were taken to gain qualitative data. The quantitative data were mainly gained from semi-structured interviews, secondary document analysis and commercial databases.

This chapter is organized as follows: The next section analyzes the features of different research approaches in social science to build up the rationale for methodological justification. Section 3 discusses the methodological choice in this study. After that, a detailed research design of the fieldwork, which covers the research process, methods of data collection, the choice and access of research subjects, and the data analysis methods are discussed. Section 5 analyzes the methodological limitations and documents the methodological findings in this study. This chapter is summarized in Section 6.

4.2 Methodologies in Social Science

There are two major streams of research approaches employed in social science: one is often labelled as ‘quantitative’ research or ‘survey’; the other one is often termed as ‘qualitative’ research (as opposed to ‘quantitative’) (e.g. Filstead, 1970; Schwartz and Jacobs, 197; Tylor and Bogdan, 1984) or ‘field research’ (as opposed to ‘survey’) (e.g. Burgess, 1982; Singleton and Straits, 1999). The two approaches differ from each other in terms of the nature of data that each engenders and the level of analysis at which each operates. However, they are not absolutely exclusive. More recently, a ‘triangulation’ approach, which combines both the two methods, is also employed by researchers in social studies. Researchers suggest that the choice of research methods must be made based on understandings of the

advantages and limitations of the two approaches and their appropriateness for the research questions (Bryman, 1988; Silverman, 2001).

4.2.1 Quantitative Approach

Originated from the positivism perspective (Comte, 1842¹⁶; Durkheim, 1938), quantitative approach is typically taken through methods employed in natural science such as social survey and experimental investigations. It seeks for the facts and causes of social phenomenon apart from the subjective states of individuals, and believes that sociology should conceive itself only within what can be observed with the senses and that theories of social life should be built in a rigid, linear, and methodical way on a base of verifiable facts (Comte, 1842),

Quantitative approach is often conceptualized by its practitioners as having a logical structure in which theories determine the problems to which researchers address themselves in the form of hypotheses derived from general theories (Bryman, 1988). It is meriting in its logic structure, relative objectivity, causality, generalization, replication, and comparability that makes it a major methodological approach in many social disciplines such as political science, economics, business and psychology.

However, limiting its conception of valid or warranted knowledge to observable data, and possessing characteristics of nature science research, quantitative approach is criticised by commentators. Hindess (1977) argues that it is hard to judge the warranty of knowledge by comparing the observed phenomena with the theories, which are developed by human beings. Furthermore, the assumption to what extent a theory-neutral observable language possible is also a concern with quantitative approach since observation itself is by no means absolutely objective. Finally, to what extent the researcher could extract the ‘real’ law and regularity and the causal relationship by reduction the factors from complex social phenomena is also questioned by commentators (Spinelli, 1989). It is argued that quantitative approach encourages a misleading emphasis on superficial facts without enough attention to understand the underlying mechanisms that cannot be observed directly.

¹⁶ Auguste Comte, 1830-1842, *Cours de philosophie positive* (Martineau (tr.), 1896, *The Positive Philosophy of Auguste Comte*, Volumes I, II, and III. London: Bell

Although quantitative approach is criticized in its ignoring the meanings of human society and the inability in exploratory work, the problems above mentioned are by no means merely located in quantitative approach.

4.2.2 Qualitative Approach

Following the interpretivism perspective (Deutscher, 1973), which is committed to understand social phenomena from the actor's own eyes and examining how the world is experienced, qualitative research tends to be associated with participant observations and unstructured, in-depth interviews which are widely employed in philosophical and sociological studies.

Opposing constructing rigid scientific laws, causality and fixed determinations about the observations in the society, qualitative approach emphasizes that researchers can only gain the knowledge about the reality based on understanding and interpreting of human being's experiences by phenomenology, verstehen, ethnomethodology, etc. By emphasizing seeing through the eyes of the subjects, narrative descriptions, processes and the contextual analysis, qualitative approach entails that researchers study the society as an insider to gain contextual and dynamic understanding of its complexity. In addition, the flexibility of qualitative approach provides researchers with a relatively open and unstructured research strategy (Bryman, 1988). Finally, qualitative approach does not impose a potentially alien framework on their subjects. It is thus good at exploring and developing theories. In the past twenty years, qualitative approach has gained great attention for its capability to explore social issues in-depth (Bryman, 1988; Deniz and Lincoln, 2000; Silverman, 2001).

Although qualitative approach is prevalent in recent years in social research, the approach is criticized for its limited capability to objectively represent the society. The problem with interpretation is a major concern. To what extent researchers understand the research subjects is a challenge because they may have different background and hold diverse perceptions about the issues (Cicourel, 1964). The respondent validation is also a problem. It is hard for the informants to understand the academic descriptive style that makes cross checking difficult. Moreover, it is difficult to code and analyse the normally huge amount of data gained from the field. The limitation in generalization, replication is also a problem with

qualitative research that may attract critiques about the reliability and validity of the research.

4.2.3 'Triangulation': A Combination of two Approaches

According to the above discussion, quantitative research relies on detached and inferential materials which may introduce systematically measurement errors, whereas qualitative inquiry involves intensive interactions between the researcher and the informant in a limited number of settings and may therefore lead to 'observer biases'. Quantitative approach aims to achieve the breadth and hence may not completely understand the context, whereas qualitative inquiry targets gaining the depth therefore may lack of the generalisability (Simon, 1963).

Even though there are obvious differences between the two approaches, the distinction is never exclusive (Bryman, 1988; Stinchcombe, 1964). A proper combination of the two research methods that is labelled as a 'triangulation' approach may bring researchers greater confidence in their findings according to the need of their research questions. That is, the two approaches may facilitate each other with their own strengths and provide mutual confirmations for the findings and hence improve the validity of the research.

There are a number of ways in which qualitative approach may facilitate quantitative research. For instance, qualitative research can act as a precursor to the formulation of problems and the development of instruments for quantitative research. Moreover, qualitative research can also facilitate the construction of scales and indices for quantitative research. Furthermore, qualitative research may facilitate the interpretation of relationships between variables in quantitative examinations; the richness of qualitative data may greatly assist analysis of quantitative data.

On the other hand, quantitative research may also facilitate qualitative research in many ways. For example, quantitative research may facilitate qualitative research is in the judicious selection of cases for further qualitative studies by mapping the issues to be addressed. In addition, the quantitative approach may assist qualitative research in providing an account of the regularities, and hence patterns of the structure. Furthermore, quantitative approach may also help qualitative research to improving the reliability and generalisability of the qualitative findings.

Researchers suggest that the triangulation approach not only reinforces the findings and improves the validity of the research, but also leads discrepancies to the findings. The discrepancies may further prompt the researchers to probe certain issues in greater depth, which may lead to fruitful areas of inquiries in their own right.

4.3 Methodological Choice

Methodology refers to the way in which people approach problems. Thus, it is suggested that the assumptions, interests and research purposes determine which methodology is chosen in a study. However, most of the existing literature on venture capital investment is solely based on reduced form analysis, which is challenged for not being able to explore and understand the insights of the emerging phenomenon. This study therefore tries to achieve the research goal by combining both qualitative and quantitative approaches according to the research purposes and the pragmatic considerations.

4.3.1 Methodological Limitations of the Existing Literature

As stated in the previous section, venture capital investment was studied until the 1980s in the US and the 1990s outside the US. Research in venture capital investment is far from mature even under the US settings. Currently, the major research interest is located in principal agency problems between venture capitalists and entrepreneurs. Most of the research questions are derived from the existing financial and contract theories that the studies are mainly conducted with theoretical deduction. Questionnaire surveys (Bruno, 1984; MacMillan *et al*, 1987; Hellmann and Puri, 2000; Manigart *et al.*, 2003), structured interviews (Wells, 1974; Fried and Hisrich, 1994; Muzyka *et al.*, 1996, Bliss, 1999), archive researches (Lerner, 1995; Kaplan and Per Stromberg, 2003; Riquelme and Rickards, 1992), real-time approaches such as verbal protocols (Sanberg, *et al.*, 1987, Hall and Hofer, 1993) and experiments (Muzyka *et al.*, 1996; Shepherd, 1999) are widely employed. However, qualitative approaches such as unstructured interviews (Bruton and Ahlstrom, 2003) and participant observations (Silva, 2004) are not employed as widely.

There are some methodological limitations located in the existing literature. Above all, quantitative approach is not at the advantage in exploring new emerged issues and understanding insights of the society due to its reductive features.

Researchers might miss some very important aspects and issues by testing models derived from the existing theories given venture capital is still a very new growing industry even in developed economy, not mentioning that in developing countries.

In addition, there are also practical issues related to data collection methods in the existing studies. For instance, most of the studies are associated with retrospective reporting questionnaire responses (e.g. Tyebjee and Bruno, 1984; MacMillan et al., 1987. Elango, et al., 1995). Some researchers try to solve the retrospection biases by applying some real-time data gathering methods. Typing verbal protocol, in which the researcher asks the research subjects to ‘think aloud’ their thoughts as they perform a particular task, has been used in Hall and Hofer (1993). And, as another real-time data gathering method, experiment is used by Riquelme and Rickards (1992) and Muzyka et al. (1996) in their conjoint analyses. Although these methods might be helpful to avoid the retrospective problems, they rely on self-reporting data that may cause other issues. For instance, the research subjects in professional business circles may give standard answers to questions in a consultancy style. In addition, there is also the possibility that the similar patterns arose because the research subjects want the report to be ‘respectable and legal’. Another potential problem is that both parties are professional communicators. They could have been ‘spin doctoring’ to each other.

Despite of the significant contributions made by the researchers, there are limitations in methodology of venture capital research. As discussed, it is hard for researchers to explore the real issues inside the industry and to avoid the retrospective/ self-reporting problems without intensive interactions with the research subjects and observations on the spot. This issue is more serious in the case of studying venture capital investment in emerging markets where the general institutions and this specific industry are not well understood by researchers yet.

4.3.2 Methodological Choice

The nature of this research and the practical considerations determine that a ‘triangulation’ methodology, which combines both qualitative and quantitative approaches appears appropriate for this study. In this research, qualitative approach is taken to explore and understand the institutional background, how venture capital

funds are structured, how venture capitalists make their investment, and how the venture capital investment mechanisms interact with the institutions in China etc. Quantitative approach is undertaken to systematically examine the specific questions and assumptions raised from the qualitative study and the existing literature. That is, qualitative position plays a major role in exploring the undiscovered facts and providing insightful understandings and interpretations on the one hand; quantitative position generalizes the regularities and consequently provides harder evidence on the other hand.

Primarily, the exploratory feature of this study calls for the inquiry of qualitative position. As stated, this study aims at exploring venture capital investment under an institutional framework in China. As an expressly exploratory work with questions like 'who', 'what', 'how' and 'why', this research tries to explore the institution of venture capital investment and the interactions between the institutions and venture capitalists' investment strategies in China. Rather than testing hypotheses extracted from the existing framework under which the major variables and the relationships between variables are precisely clarified at the outset, the researcher tries to raise the specific research questions based on the qualitative finding and, the understanding in the existing literature together. As stated, it is suggested that qualitative approach is privilege in exploring, understanding and explaining the undiscovered facts in the field (Bryman, 1998; Silverman, 2001). Therefore, the exploratory nature of this research determines that qualitative approach is critical in gaining a set of rich and insightful data for this study.

In addition, the feature of this study in seeking for the cause-and-effect relationship between venture capitalists' investment activities and the institutions in China also calls for a qualitative position. According to Singleton and Straits (1999), statistics can tell whether there is a relationship between factors while it hardly provides information on whether the relationship is causal or not. This problem is especially serious when there are more than two independent factors. Scholars suggest by deeper involvements with the research subjects in the field and figuring out the contextual process, researchers would gain more possibilities in proposing a reasonable mechanism to account for the cause-and-effect relationship (Bryman,

1998; Yin, 1994; Lee et al., 1999). Therefore, this study asks for the helps of qualitative techniques.

Moreover, the theoretical framework employed in this study also suggests qualitative approach is important in this research. This study explores venture capital investment in China under a new institutional economics framework. New institutional economics, given the broader scope of analysis, relies less heavily on econometric techniques but more on comparative method to collect information and pursue generalizations about the economic activities of human groups (Polanyi et al., 1977; Stanfield, 1986). Qualitative methods like interviews and participant observations are specified in recording activities, rules, and applicable understandings or cultural underpinnings that comprise human behaviours unfolding in an institutional context (Stanfield, 1999).

Furthermore, the emphasis of this research on accurately reflecting the reality calls for a qualitative position. It is widely known that venture capitalists are all well-trained professionals and communicators. As discussed, it may be hard to avoid the research subjects repeating standard consultancy line when they face survey questionnaires or structured interviews. It is thus suggested that qualitative methods that provide on spot observations of the researcher and direct interactions between the researcher and the research subject may help to mitigate the retrospective reporting problems. In addition, a flexible and rapport atmosphere in relaxed conversations may stimulate more opinions emerged simultaneously that is very valuable for gaining the insights.

Finally, practical concerns also suggest deploying qualitative approach. The research subjects are mainly financiers or entrepreneurs who are normally too busy to respond to a questionnaire survey. The face-to-face interviews may help to improve the response rate. People working in financial institutions are sensitive about providing information to outsiders. A more relaxed atmosphere in interviews can help in building up a more trustable and rapport relationship with the research subjects and, consequently to ease the sensitivities. This is even more important while doing research in China where '*Guanxi*' (networks) is a visible part of the culture. These networks are critical in the whole process of the fieldwork including gaining access to the research subjects and the sensitive information, etc. The

connections normally come through a referral from friends rather than formal channels in China. Such a requirement encourages qualitative approaches that might provide closer and more relaxed interactions with the subjects.

Even though qualitative techniques are good at social reality exploration, understandings and causal relationship analyzing etc., the objectives of this research can not be fully achieved with qualitative methods solely. The nature of this research also calls for assistance of quantitative approach. Primarily, the validity of the research findings needs to be improved with quantitative techniques. Qualitative approach has long been challenged for its lack of representativeness and objectiveness due to the limitation of the sample size and the deep involvement of the researcher with the research subjects. By contrast, quantitative approach is not only at the advantage in generalizing the research findings and providing systematic evidence, but also privilege in keeping the researcher with a more objective strand as an outsider. Thus, in order to reinforce the validity of qualitative findings, this study also employs quantitative approach to examine the findings systematically and objectively, and consequently generalize the results. Moreover, the research questions and theoretical framework also suggest that quantitative techniques are important in this study. The discussion in this study is based on initial knowledge and understandings of venture capital industry evolution and the institutional environments in China. This entails us to ask for assistance from statistical data and other secondary documents analysis.

At the same time, the practical concerns also encourage to employ quantitative techniques. Due to the economic and time constraints, it is impossible to gain all the needed information with the field observations or interviews. The sample size is always limited for qualitative research. Thus, quantitative techniques such as secondary documents and commercial database are used in this study to generalize the research findings.

To summarize, the nature of this study and the practical concerns suggest that a ‘triangulation’ strategy which combines both qualitative and quantitative approaches is proper for this study. Qualitative approaches are taken as the major methods to answer the questions with ‘who’, ‘what’, ‘how’ and ‘why’ etc., whilst

quantitative approaches are taken to test the hypotheses derived from the existing literature and the findings from the qualitative analysis.

4.4 Research Design

Consistent with the methodological choice, this study consists three different phases with various data collection methods. Unstructured in-depth interviews, semi-structured interviews, secondary document analysis, and commercial database are employed to collect data for this study. This multi-method approach helps to illuminate different facets of the questions and, thus increase the validity and reliability of this study.

4.4.1 Research Process: A Multi-phased Design

A three-phased research design was constructed in order to achieve the research objectives. The three different stages were composed of the exploration of the specific questions, the systematic examination on the questions, and, the explanation for the findings from the exploration and systematic analysis (see Table 4.1).

At the initial stage, the researcher aimed to clarify the specific research questions based on the understanding of the existing literature and the explorations from the field. Unstructured in-depth interviews, semi-structured interviews and secondary document analysis were major data collection methods at this stage. It was divided into three parts. At first, the general research questions were addressed based on the understanding in the existing literature (as shown in section 3.6). The questions served as a conceptual framework in the researcher's mind to draft the inquiry of the unstructured interviews and direct the secondary document analysis. With the guidance of the conceptual framework, unstructured interviews and secondary document analysis were then taken to explore the major features of venture capital institutions and venture capitalists' investment strategies in China. The unstructured interviewees included venture capitalists, entrepreneurs, researchers and government officials. Information on the major mechanisms, especially the unique features of venture capital investment in China was collected directly from the practitioners including venture capitalists and entrepreneurs. In addition, the subjects' views on institutions related on venture capital investment were gathered from the interviews with the practitioners, researchers and government officials, and,

the secondary documents analysis. In this way, better understandings in what happens in the field, what the major questions are, and, whether there are any factors, definitions or measurements unique under this research context were gained. Based on these initial findings, an inquiry for semi-structured interviews with venture capitalists was drafted to address the questions raised from the field. With the analysis of the findings from semi-structured interviews, the specific research questions, mostly in the form of hypotheses, were clarified.

At the second stage, systematic analysis on the hypotheses and questions raised from the initial stage was conducted. Data from semi-structured interviews, secondary documents analysis and commercial database were combined for the analysis. Primarily, the analysis on venture capitalists' screening criteria was mainly based on the data gained from semi-structured interviews. In addition, the information gathered from the semi-structured interviews with venture capitalists mainly served for providing indicators and measurements for the econometric analysis on venture capitalists' investment preferences and stage financing strategies. Commercial databases and secondary document analysis provided detailed investment information of the venture capital firms and their portfolio companies for statistical examinations.

The third stage consisted of unstructured interviews with venture capitalists again to reinforce the primary findings and enrich the understandings and explanations for the findings. The primary findings from both the qualitative and quantitative examinations were discussed with the interviewees to review whether the key points were caught by the author. In addition, insightful explanations for the puzzles in the analysis from the insiders were gained in this way.

Table 4.1 A Multi-phased Research Design

	Data collection methods	Purposes	Outcomes
Stage I: Initial exploration	1. unstructured interviews, 2. secondary analysis, 3. Semi-structured interviews	1. exploring the insights 2. clarifying the specific research questions	1. inquiry of the semi-structured interviews 2. specific research questions
Stage II: Systematic examinations	1. semi-structured interviews 2. commercial databases	1. systematically examining the research questions	1. quantitative analysis result
Stage III: explanation & reinforcement	1. unstructured interviews	1. reinforcing the findings 2. explaining the results	1. more validated results 2. enriched explanations & understandings

4.4.2 Data Collection

As shown in the foregoing subsection, unstructured interviews, semi-structured interviews, secondary documents analysis, and commercial survey data were the major sources of the data in this study. The choice of data collection methods echoes Simon's (1977) view: 'One must avoid limiting oneself to a narrow choice of methods... several methods together may provide better and cheaper answers than any single method can.'

4.4.2.1 Unstructured Interviews**1. Why unstructured interviews?**

An unstructured interview is a spontaneous conversation where questions can be changed or adapted to meet the respondent's intelligence, understanding or belief. It does not offer any set format but in which the interviewer may have some key questions formulated in advance. The interviewer aims to listen to how each individual person responds to the questions. . Normally, the respondent may have more control over the conduct of the interview in that they are often allowed to discuss issues as they arise and not necessarily in an order predetermined by the interviewer. Unstructured interview is good in delving deep beneath the surface of superficial responses to obtain meanings that individuals assign to events, and the complexities of their attitudes, behaviours and experiences. The major advantages of

unstructured interview are that more complex issues can be probed and answers can be clarified. The result of this more open-ended approach is a richness of data which is unbiased by any interpretation which the interviewer may have placed on it.

Unstructured interviews have played an important role in this study. As stated, at the initial stage of this research, unstructured interviews provided a general understanding of the problems and helped to clarify further research questions and construct the inquiry for semi-structured interviews. In addition, unstructured interviews also facilitated the author to understand and interpret the findings of the quantitative analysis. Finally, cross-checking the research findings with the interviewees through unstructured interviews helped to improve the credibility and reliability of this research.

However, there are also inevitable disadvantages of unstructured interview. The main difficulty with unstructured interviews is that they are time consuming and the data are difficult to sort and analyze. Only small size of samples can be interviewed that the representitiveness is not guaranteed. Moreover, the data collected from different respondents will obviously be different, and therefore not always comparable; this may raise issues of reliability and validity for data collected in this way. Furthermore, even though more intensive interactions and involvements with research subjects may provide greater depth, the researcher may lose objective judgments and understandings. In this study, the weaknesses of this qualitative approach were compensated with the helps of quantitative techniques that are being discussed in the next sections.

2. Sampling of unstructured interviews

To invest in China, venture capitalists not only need to interact with entrepreneurs but also have to deal with related governmental agencies or other external relations. To explore venture capitalists' investment in China while ignoring the related participants in this market might bias further inquiry. Therefore, the unit of analysis was not pre-determined in this study. Rather, it was identified in the field. In order to achieve this exploratory goal, a practical non-probability sampling strategy was chosen for the unstructured interviews. Convenience sampling and snowball sampling approaches were the major methods for accessing the research subjects.

Both convenience and snowball sampling approaches are widely employed in social research. A convenience sampling approach is a sampling strategy where the subjects are selected, in part or in whole, at the convenience of the researcher. Since the major targeted research subjects are people working in financial sector, who are very busy and traveling often, it is very hard for the researcher to reach them. It suggests that a convenience sampling might be more practical to gain access to them. Similarly, snowball sampling uses recommendations to find research subjects of the major interests of the researcher. It allows the researcher to identify the resources and determine the stakeholders, and, consequently locate information-rich locating information-rich key informants. Using this approach, a few potential respondents are contacted and asked whether they know of anybody with the characteristics that the researcher is looking for. Normally, snowball sampling is not a stand-alone tool; the tool is a way of selecting participants and then using other tools, such as interviews or surveys.

Convenience and snowball sampling are the easiest and potentially most dangerous approaches that might lead to sampling biases. However, in this study, the researcher makes little attempt to insure that this sample is an accurate representation of the larger group or population. The major purpose of conducting the unstructured interviews was to exploring the potential questions and explaining the quantitative results.

Friends, former colleagues and classmates who work as venture capitalists and entrepreneurs were firstly interviewed at convenience. Then, some other interviewees were accessed through referrals. In this way, 17 unstructured interviews were taken at the initial stage for exploring the major issues. The sample of the unstructured interviews was composed of seven venture capitalists from five venture capital firms, four entrepreneurs, two government officials and four researchers. Among the seven venture capitalists, four were from three foreign venture capital firms, three were from three domestic venture capital firms. All the entrepreneurs interviewed were in high-technology industry. Among them, one was backed by venture capital investment; one was in the process of negotiating with venture capitalists; two were not involved in venture capital investment. One of the two government officials was from the Ministry of Science & Technology (MoST)

and the other one was from the Administrative Committee of Zhongguancun Science Park. Two researchers were from the research division of Zero2IPO, which is the largest venture capital investment survey company in China. The other two researchers were from universities.

The samples of the interviews with entrepreneurs, government officials and researchers are summarized in Table 4.2 and Table 4.3. The samples of interviews with venture capitalists are summarized in Table 4.4.

Table 4.2 Samples for Interviews with Entrepreneurs

INTERVIEWEES	RESEARCH METHODS	VC-BACKED?	DATA ANALYSIS ID
Entrepreneur 1	Unstructured interview	Yes	EN1
Entrepreneur 2	Unstructured interview	In process	EN2
Entrepreneur 3	Unstructured interview	No	EN3
Entrepreneur 4	Unstructured interview	No	EN4

Table 4.3 Samples for Interviews with Researchers and Government Officials

INTERVIEWEES	RESEARCH METHODS	ORGANIZATION	DATA ANALYSIS ID
Gov Officer 1	Unstructured interviews	MoST	GO1
Gov Officer 2	Unstructured interviews	Zhongguancun Science Park	GO2
Researcher 1	Unstructured interviews	Zero2IPO	RE1
Researcher 2	Unstructured interviews	Zero2IPO	RE2
Researcher 3	Unstructured interviews	University	RE3
Researcher 4	Unstructured interviews	University	RE4

3. Inquiry of the unstructured interviews

The inquiries of the unstructured interviews with different units of analysis varied from each other. The emphasis was the interviews with venture capitalists. As stated, the inquiry framework was guided but not limited by the existing literature. The existing studies served as a general framework that led the conversation into major questions.

Two broad topical areas were examined in the unstructured interviews with venture capitalists. The issues related to fundraising and governance of venture

capital firms were discussed. Questions on venture investing including the ex-ante project selection, the management of the portfolios and divestment were also investigated.

The interviews were designed to yield in-depth data. They ranged from one hour to three hours in length. The interviews were taken in either Chinese or English according to the subjects' preference. Field notes or audio-records were taken according to the consents of the participants. The notes or tape records verbatim were then generated and sent back to the informants for their review to ensure the accuracy. New issues and elements raised from the interviews were particularly concerned and marked. The interviews were loosely structured. The major open-end questions for venture capitalists were as follows:

- 1) How do you find out the potential deals? Who is in charge of finding new deals in your firm?
- 2) How do you make ex-ante project screening? What do you consider as important factors in your project screening? Why?
- 3) What kind of project is the most attractive for venture capital investment in China? Why?
- 4) How do you do due diligence? What is the major information you need? Why?
- 5) How do you design the mechanisms to provide incentives to entrepreneurs? What kind of mechanisms is most important and valid in China from your experience? How does it work?
- 6) Would you like to stage the capital infusion? If so, why? What kinds of projects are mainly financed by stage? Why? How does stage financing work?
- 7) What do you consider as the major risks and what as the major advantages in investment in China?

The interviews with entrepreneurs were mainly focused on how they finance their start-up companies and how they view the impact of venture capital investment on their own entrepreneurial activities. The questions with entrepreneurs were as follows:

- 1) How did you gain the initial capital for starting your company?
- 2) What kind of difficulties did you face in funding your company?
- 3) Why did you choose venture capital investment?
- 4) What do you think are the major factors for the venture capitalist to invest in your company? Why?
- 5) Why didn't you look for venture capital investment? What are the major alternative financing sources?
- 6) How did you negotiate with venture capitalists? What are your major concerns in negotiations?
- 7) How do the stage financing arrangements influence your business strategy making?
- 8) What kind of supports do venture capitalists provide to you? Do you think they are helpful? Why?

Interviews with government officials and researchers were much looser than those with venture capitalists and entrepreneurs. The focuses were mainly on the dynamics of the institutions in China and their opinions on how the institutions interact with venture capitalists' investment in China. The interviews provided important background knowledge for further interviews with venture capitalists and entrepreneurs and secondary documents analysis.

4.4.2.2 Semi-structured Interviews

1. Why semi-structured interviews?

Semi-structured interviews were conducted to obtain the both qualitative and quantitative data. Based on the findings from the unstructured interviews and the understanding in the existing literature, the inquiry of the semi-interviews was constructed.

Initially, the researcher aimed to gain systematic data with structured interviews. However, the plan was adjusted in the field after three structured interviews with venture capitalists. First, it was found that the interviewees were reluctant to answer some close-ended questions due to confidentiality concerns whereas very often the answers were emerged under a more relaxed and rapport environment when the rigid structured interviews ended. Second, with more

interview experience, the researcher found that more insights were needed to understand the complexity of the issues. While a structured interview has a formalized framework, a semi-structured interview is flexible, allowing new questions to be brought up during the interview as a result of what the interviewee says. Therefore, semi-structured interviews were chosen to gain more insightful understandings from a broader scale of research subjects and, obtain the objective information with the close-ended questions at the same time.

The semi-structured interviews were guided by both open-ended and close-ended questions. The opened ended questions were the same to those for the unstructured interviews in order to gain more insightful qualitative data. The close ended questions served for quantitative analysis. Some of the quantitative data from the semi-structured interviews were used for direct analysis on venture capital institutions and their investment strategies. The other part of data collected from the semi-structured interviews was used as pilot tests for further data collection. Since part of the firm-level investment data was gained by the researcher with secondary document analysis in this study¹⁷, the researcher tried to compare the data gained from direct interviews with those gained from secondary document search. In this way, the researcher tested the credibility of the publicized investment information. According to the researcher's comparison, the data gained from secondary document analysis are reliable.

Similar to the unstructured interview, however, a semi-structured interview is also challenged for its weaknesses in lacking capability to generalize the findings. At the same time, it is difficult for the researcher to balance the relaxed conversations and the pre-set inquiry in semi-structured interviews. However, the fieldwork experience shows that guided by both open-ended and close-ended questions, semi-structured interviews substantially improved the respondent rates and enriched the findings in this study.

2. Sampling of semi-structured interviews

The unit of research subjects for semi-structured interviews was venture capitalists. Both telephone and face-to-face interviews were taken at the convenience of the research subjects.

¹⁷ Please refer section 4.4.2.3 for details.

With the concerns about the difficulties in accessibility to the research subjects, convenience sampling and snowballing were again chosen for sampling strategy in the semi-structured interviews that was similar to that of the unstructured interviews. That is, the convenience and snowball sampling strategies were taken for the semi-structured interviews. However, more efforts were made to access venture capitalists that are more active in China's market.

After hundreds of telephone and email contacts with the potential research subjects that were referred by friends or former interviewees, 37 venture capitalists from 34 venture capital firms were interviewed. 18 of the 37 venture capitalists are from the top 30 venture capital firms in China. The 34 interviewed venture capital institutions have invested in over 600 deals in China which consist more than one fourth of the total venture capital investment by the number of deals.

Among the 34 venture capital firms, 22 are foreign venture capital firms whereas 12 are domestic ones. The majority of foreign venture capital firms are from the US among which 12 are from California or Massachusetts. In addition, 19 out of the 22 foreign venture capital firms are structured as limited partnership whereas three are structured as limited companies. As for the domestic venture capital firms, the majority are from Beijing. In addition, all of them are structured as limited companies. The samples and research methods used in the interviews with venture capitalists are summarized in Table 4.4.

3. Brief inquiry of semi-structured interviews

Based on the information gathered from initial the documentary analysis and unstructured interviews, the inquiry of the semi-structured interviews was designed to explore more general patterns of venture capitalists' investment activities in China. The inquiry for the semi-structured interviews was composed with two parts. The first part was open-ended questions which were the same to the inquiry of the unstructured interviews. The second part was close-ended questions that covered the firm-level information of the venture capital firms and their portfolio companies, the management of the venture capital firms and the investment strategies of the venture capital firms. The close-ended questions are as follows:

■ General information about the venture capital firm:

- 1) Year of establishment, place of registration

- 2) Fund volume, fund sources
- 3) Organizational structure
- 4) Educational background and professional experiences and age of the professional staff member
- 5) Educational background and professional experiences and age of the senior managers
- 6) Shareholders information and the ratio of their shares
- 7) Industry preference, stage preference and geographical preference
- 8) Average investment size for different stage and industry
- 9) Screening criteria
- 10) Information for due diligence activities
- 11) Major evaluation methods
- 12) Contracting and negotiation process
- 13) Supportive and monitoring activities provided
- 14) Syndication motives
- 15) Syndication structure
- 16) Stage financing motives
- 17) Stage financing structure
- 18) Others
 - Information on the portfolio companies
 - 1) Industry, stage, and place of headquarter
 - 2) Entrepreneur's characteristics
 - 3) Product/service characteristics
 - 4) Market characteristics
 - 5) Financial characteristics
 - 6) Performance of the firm
 - 7) First or repeated investment
 - 8) Forecast sales in business plan
 - 9) Capital committed, capital provided
 - Major measurements for screening criteria
 - 1) Product-market (market size and growth, the attractiveness of products and service, technology, etc.)

- 2) Strategic-competitive (business model, the customer adoption, competition and barriers to entry, etc.)
- 3) Management team (experience, personality, capability, loyalty, networks, etc.)
- 4) Financial (other investors, valuation, performance to date)
- 5) Cash-out potentials (financial market and exit conditions, etc.)
- 6) Regional fit
- 7) Others

■ Major measurements of venture capitalists' monitoring activities:

- 1) Venture capitalists are active in replacing management teams;
- 2) Venture capitalists are active in regular visits to the portfolio companies
- 3) Venture capitalists are active in monitoring the financial statement of portfolio firms;
- 4) Others.

■ Major measurements of venture capitalists' supportive actions before investment:

- 1) Venture capitalists are active in shaping strategy/business model;
- 2) Venture capitalists are active in helping entrepreneur in marketing
- 3) Venture capitalists are active in recruiting senior managers or experts
- 4) Others.

■ Major measurements of deal terms:

- 1) Valuation of portfolio company
- 2) Allocation of shares, voting rights, seats in board, and veto right
- 3) The use of different securities
- 4) Entrepreneur's compensation design
- 5) Stage financing arrangement
- 6) Syndication investment
- 7) Others.

Table 4.4 Samples for Interviews with VCs

INTERVIEWEE	ORGANIZATION	INTERVIEW METHODS*	LOCATION OF THE VCF	FVCF OR DVCF*	STRUCTURE OF THE VCF	POSITION OF THE VC
VC1	VCF1	UI&SI	California	FVCF	LPVCF	Partner
VC2	VCF2	SI	California	FVCF	LPVCF	Vice President
VC3	VCF3	UI&SI	California	FVCF	LCVCF	Investment Manager
VC4	VCF4	2UI&SI	Beijing	DVCF	LCVCF	General Manager
VC5	VCF5	SI	Beijing	DVCF	LCVCF	Investment Manager
VC6	VCF6	SI	London	FVCF	LPVCF	Partner
VC7	VCF7	SI	Washington	FVCF	LPVCF	Investment Manager
VC8	VCF8	SI	Beijing	DVCF	LCVCF	General Manager
VC9	VCF9	SI	California	FVCF	LPVCF	Partner
VC10	VCF10	SI	Cologne	FVCF	LPVCF	Investment Manager
VC11	VCF11	SI	California	FVCF	LPVCF	Vice President
VC12	VCF12	SI	California	FVCF	LPVCF	Investment Manager
VC13	VCF13	SI	Singapore	FVCF	LCVCF	Vice President
VC14	VCF14	SI	California	FVCF	LPVCF	Partner
VC15	VCF15	SI	California	FVCF	LPVCF	Partner
VC16	VCF16	2 UI&SI	California	FVCF	LPVCF	Partner
VC17	VCF16	UI&SI	California	FVCF	LPVCF	Investment Manager
VC18	VCF17	SI	Massachusetts	FVCF	LPVCF	Partner
VC19	VCF18	SI	Tokyo	FVCF	LPVCF	Vice President
VC20	VCF19	SI	New York	FVCF	LPVCF	Partner
VC21	VCF20	UI&SI	Beijing	DVCF	LCVCF	Vice President
VC22	VCF20	SI	Beijing	DVCF	LCVCF	Investment Manager
VC23	VCF21	SI	Shanghai	DVCF	LCVCF	General Manager
VC24	VCF22	UI&SI	Shenzhen	DVCF	LCVCF	General Manager
VC25	VCF23	SI	Taipei	FVCF	LPVCF	Vice President
VC26	VCF24	SI	California	FVCF	LPVCF	Partner
VC27	VCF25	SI	New York	FVCF	LPVCF	Investment Manager

VC28	VCF26	SI	Hong Kong	FVCF	LPVCF	Partner
VC29	VCF27	SI	Oberhaching	FVCF	LCVCF	Investment Manager
VC30	VCF28	SI	Beijing	DVCF	LCVCF	Investment manager
VC31	VCF29	SI	Beijing	DVCF	LCVCF	General Manager
VC32	VCF30	SI	Beijing	DVCF	LCVCF	Vice President
VC33	VCF31	SI	Shanghai	DVCF	LCVCF	Vice President
VC34	VCF32	SI	California	FVCF	LPVCF	Vice President
VC35	VCF33	SI	New York	FVCF	LPVCF	Vice President
VC36	VCF34	SI	Beijing	DVCF	LCVCF	Investment manager
VC37	VCF21	SI	Shanghai	DVCF	LCVCF	Investment manager

*: UI: unstructured interviews; SI: semi-structured interviews

4.4.2.3 Secondary Document Analysis

1. Why secondary document analysis

Secondary documents analysis was conducted both prior to the field work, in field and afterwards for gaining the background knowledge at initial stage and better understandings at later stage. Secondary is at the advantage of richness, accessibility and lower cost. In this study, the secondary document analysis not only helped the researcher to gain important background information but also served as a very important source for gathering quantitative analysis data.

First, the secondary document analysis helped the researcher to gain background knowledge and aggregate data for this study. The websites of the government agencies, international organizations like the World Bank, the International Monetary Fund and venture capital associations around the world provide various reports and statistics concerning entrepreneurship and venture capital investment around the world at an aggregate level and information on institutions that are critically important for the researcher to understand the major issues before the fieldwork. Moreover, published reports, statistics, academic literature, and business magazines are also good sources for gaining the overall information and individual cases. In addition, the websites of the venture capital firms, venture capital backed companies and other company documents were important sources for the

researcher to gain more information on the interviewees. The time for interviews was limited. Being more familiar with the research subjects helped the researcher to catch the key issues before interviews. In addition, the secondary document also helped the researcher to clarify some information as cross-check after the interviews since sometimes information was not accurately noted in the field.

Second, the secondary document analysis also helped the researcher to gather firm-level data for the econometric analysis in this study. The websites of the venture capital firms, the venture capital backed companies and related survey companies provide very valuable information on individual investment cases. As stated, data on venture capital investment in China is extremely scarce. There is almost no commercial database covering the investment details at firm level except the ‘Venture Economics’ database (see details in the next subsection). However, the ‘Venture Economics’ database mainly covers the information on investment deals made by foreign venture capital firms in China. The coverage on deals made by domestic venture capital firms is very limited. It by no means represents the population if a study on China’s venture capital investment misses the analysis on investment made by domestic venture capital firms. Therefore, the researcher tried to gain more firm-level data on investment details through the secondary document analysis to enrich the existing database. More efforts were made to gather the investment data of domestic venture capital firms. In this way, about half of the investment data for econometric analysis in this study was hand collected by the researcher by this way. That is, information on over 150 venture capital firms and over 400 venture capital backed companies were collected from the secondary documents analysis.

As stated, data on venture capital investment in China is extremely scarce. Secondary documents analysis not only facilitated this study with background knowledge but also enriched the researcher’s understandings and improved the accuracy of this study. The major sources of archive research are stated as follows:

■ **Documents and information from the Internet**

1. Information about the venture capital firms being interviewed;
2. Information about portfolio companies of the venture capital firms being interviewed;

3. Legislation regulating venture capital investment;
4. Related information of law, regulation, and public policies.

■ **Other sources of archive: CVCA reports, Zero2IPO reports, World Bank reports, government statistics yearbooks, academic literature, business magazines etc.**

1. Aggregate data about venture capital industry in China;
2. Aggregate data about industrial development in China;
3. Information about the evolution of venture capital policy in China;
4. Institutions in China;
5. Comparison of institutions in China with other countries;
6. Data on venture capital investment in other countries;
7. Case analyses of venture capital investment in China.

4.4.2.4 Secondary Survey Data

Secondary survey data were used for a more systematic analysis in this study. With the information collected from a large number of respondents, secondary survey data allowed the author to use more sophisticated statistical techniques to determine validity, reliability and statistical significance of the research at a lower cost. Two major commercial databases used in this study, i.e. ‘Venture Economics’ and ‘The Survey for Large and Medium Sized Industrial Enterprises in China 1998-2005’.

The ‘Venture Economics’ database provides information on venture capital firms and venture capital backed deals. It is the most prominent database that covers venture capital and private equity investment information around the world. It has been used by many studies on venture capital investment. Thus, the definition and measurements in this database are comparable across countries. Information on the industry, age, location, investment value, investment rounds, investors’ composition, public status etc. of the venture capital backed deals and the information on the venture capital firms are covered by this database. Overall, this database covers over 540 venture capital backed deals in China (some of them are paralleled with the ones collected from secondary documents analysis and interviews). It is accounted about one fifth of the total venture capital backed deals closed in China. However, the majority of the deals (i.e. over 75%) were backed by foreign venture capital firms.

The coverage of this dataset on domestic venture capital firms and their portfolio companies are limited. In this study, the researcher therefore employed secondary document analysis to collect more firm level investment data of the domestic venture capital firms from various sources to complement the biases of the data (as seen in the previous subsection). In total, over 1000 venture capital backed deals made by over 160 venture capital firms were gained from this commercial database and the secondary document analysis. These two different data sources cover about firm level data on over half of venture capital firms and over two fifths of the venture capital backed deals in China.

The ‘Survey for Large and Medium sized Industrial Enterprises in China 1998-2005’ was also used in this study to gain the industry level data for some variable including the R&D intensity and asset intangibility etc. This dataset covers financial information on over 200,000 of China’s industrial enterprises from 1998 to 2005. It is currently assumed to be one of the most detailed firm level databases on industrial enterprises which is publicised to researchers in China. It is suggested that it covers the whole population of the enterprises whose annual sales volume is over RMB 5 million.

4.4.3 Data Analysis

Consistent with the methodological choice which combines both qualitative and quantitative approaches, various data analysis methods were employed in this study.

At the initial stage of this study, data collected from secondary documents were sorted out and coded for the foundation of the interviews. Furthermore, content analysis, a qualitative technique (Berelson, 1952; Simon, 1969) in which the responses to the questions are grouped into a logical and orderly set of discrete categories, were used to measure the immeasurable data from the qualitative fieldwork. Data gathered from the interviews were coded both manually and with the assistance of NviVo (a computer based qualitative package). Based on the coding work, the author translated them into formulated empirical arguments and refined them into systematic analysis models.

At the later stage, quantitative data from the secondary document analysis, interviews and secondary survey database were combined to construct a unique

database for this study. Then, statistical techniques were employed for examining the hypotheses. Stata 9.0 for Windows is the major econometric program for the quantitative analysis. The econometric models and the methods are discussed in details in chapter 6, chapter 7 and chapter 8 respectively.

4.4.4 Validating Procedures

Validity and reliability of a social research work have been concerns of all scholars. The researcher tried to secure the credibility of this study by various ways.

Primarily, the ‘triangulation’ strategy and the multi-phased research design were the most important instrument to improve the validity and reliability of this study. As previously discussed, the researcher aimed to accurately explore and examine venture capital institutions and venture capital investment strategies in China by combining both the qualitative and quantitative approaches.

First, this methodology and research design helped to improve the face validity and content validity. The qualitative approach may help the researcher to address the right issues for this study. Venture capital investment in China has not been well studied. It is therefore very hard to identify a content area without in-depth field investigations (Warwick and Linninger, 1975). In this study, the researcher decided to let the specific questions and the categories of the research subjects emerged from the field rather than conducting a reduced form examination. The interviews allowed the research subjects identify the content of the test to be developed. In this way, the researcher tried to gain enough insights and understandings in the research subjects and address the right questions for this study.

Second, the methodology and the research design of this study also helped to improve the construct validity. As stated, literature survey was an important part of research at the initial stage of this study. Actually, in this whole process of this study, the researcher kept the existing literature in mind for comparison with the observations in the field. Following Carmines and Zeller (1979), the researchers tried to specify the theoretical relationships in the existing literature and, how the theoretical issues are related to the empirical observations. Based on the interviews and secondary document analysis, the researcher then focused on constructing the specific measures for this study based on the empirical findings and the understandings in the existing literature. The theory underlying the construct to be

measured has been considered all the time in this study. The researcher suggests that the validity of operationalization was improved in this way.

Third, the methodology and the research design of this study helped to improve the reliability. The reliability of qualitative approaches are long been challenged due to the small number of samples and the subjective understandings of the researcher. This study therefore employed quantitative approach to examine the qualitative findings in order to improve the reliability. In addition, the researcher also paid much attention to improve the reliability of the quantitative examinations. Above all, the researcher tried to operationalize the variables in a precise way that the definitions of the variables were easy to understand. In addition, the researcher tried to access data on more samples for the quantitative analysis. It is very hard to access the firm-level data on private equity investment. The researcher therefore tried to combine data gained from different sources to make sure the sample can proportionally reflect the population. For example, the researcher on purposely gathered more investment data on domestic venture capital firms and their portfolio companies to compensate the lack of data with this regards.

Moreover, the researcher also tried to improve the validity and reliability by improving the quality of the data collected. For example, the researcher tried to free the informants' minds of apprehensions with the principles of the anonymity and confidentiality. It is guaranteed that the informants and their organizations would not be identified by name in this thesis and future publications. Moreover, the author accessed the informants through trustable channels and built up a rapport during the interviews. In this way, the researcher tried to overcome the 'cover-up' obstacles (Simon, 1969) and gain a more open atmosphere for interviews so that the informants would reduce concerns about confidentiality and expose more accurate and insightful information.

Finally, follow-up reviews and pre-tests were taken to ensure the validity of the study. During the whole process of this study, the researcher tried to keep on reviewing the inquiries of the interviews with the informants in order to reduce misunderstandings or irrelevance problems.

4.4.5 Structure and Time Scale of the Fieldwork

The structure and schedule of the fieldwork are summarized in Table 4.5.

Table 4.5 Structure and Time Scale of the Fieldwork

TIME PERIOD	ACTIVITIES
Jul-Sep, 2004	First field trip to China <ul style="list-style-type: none"> • Preliminary contacts with potential interviewees • Gathering secondary documents for the potential samples • Two unstructured interviews with researchers were taken • Three unstructured interviews with venture capitalists were taken • One unstructured interview with a Government officer was taken • Two unstructured interviews with entrepreneurs
Nov, 2004 –Feb, 2005	<ul style="list-style-type: none"> • Gathering secondary documents • Contacting potential interviewees • Preparing unstructured interview inquiry
Mar-May, 2005	Second field trip to China <ul style="list-style-type: none"> • Four unstructured interviews with venture capitalists • Two unstructured interviews with researchers • One unstructured interviews with a Government officer • Two unstructured interviews with entrepreneurs • Analyzing and sorting unstructured interviews • Consolidating key interview questions • Designed semi-structured interview inquiry
Jun, 2005-Feb, 2006	Third field trip to China <ul style="list-style-type: none"> • 37 semi-structured interviews with venture capitalists • Gathering secondary documents • Gathering and sorting secondary survey data • Sorting out data from interviews • Combining secondary data and the first hand collected data from interviews
Feb-Jul, 2006	<ul style="list-style-type: none"> • Analyzing data • Confirm specific research questions • Preparing empirical report to interviewees for validation

4.5 Methodological Limitations and Findings

4.5.1 Methodological Limitations of this Study

In the previous sections, the rationale behind the research strategies and the methodological procedures undertaken in this study were discussed. Even though the researcher has made many efforts to secure and improve the validity and the reliability, the methodological limitations are inevitable.

Above all, the sample biases with the interviews should not be ignored. As discussed, the samples for the interviews were selected by convenience and snowball sampling strategies. These sampling methods are normally challenged for its lack of capability to represent the population. However, in this study, the researcher did not attempt to claim representitiveness of the interview findings. As a matter of fact, the interview findings mainly served as background knowledge and understandings for the researcher to raise specific research questions and hypotheses in the studies on venture capitalists' investment preferences and the stage financing strategies. As for the study on venture capitalists' project screening criteria, the sampling weakness was not avoided since the majority data for analysis were from the practitioners through the interviews. The researcher tried to send out the survey questionnaires on project screening to the research subjects at the initial stage. However, the response rate for the questionnaire survey was extremely low¹⁸. The way for the researcher to limit this weakness was to access more samples and focus more on the exploratory aspects of the findings.

In addition, the sample biases with the quantitative data also exist. There is no existing dataset that covers the whole population on venture capital investment in China. The researcher chose the samples by accessibility rather than pre-set systematic sampling strategies. The samples therefore might be biased. The researcher tried to compensate the weakness by accessing more samples and, balance the proportion of the samples according to the aggregate statistics. For example, the researcher tried to collect more information on domestic venture capital firms and their portfolio companies through the secondary document analysis to balance the samples of different groups. However, the biases could not be fully avoided.

¹⁸ At the initial pre-test stage, the researcher sent out over 100 questionnaires whereas only 17 venture capitalists responded to the email. However, among those who responded, only four of them returned back valid questionnaires with answers.

Normally, more successful investment institutions intended to release more information to public whereas the less successful ones are reluctant to publicize the information. So, the samples might have overestimated the performance of the venture capital firms in China.

Moreover, there are also potential biases with the data collection methods for the quantitative data. As stated, the data on venture capital firms and venture capital backed companies were gained from two different sources, i.e. one was from a commercial database, and the other one was collected by the researcher with secondary document analysis. The researcher then combined the two data sets together to conduct the econometric analysis. This raises the challenges on the compatibility of the two datasets. The researcher tried to solve this potential problem by digging in the methodology used by the 'Venture Economics'. According to the description of 'Venture Economics' on the data collection methods, for the European and Asian components of the database, 'Venture Economics' collaborates with local consulting and survey companies to solicit the investment information from the venture capital firms. As stated, the majority firm-level data collected in this study were mainly gained from the secondary document analysis. Although it seems that this data collection method is different from that of the 'Venture Economics', the researcher actually has pre-test this method by comparing the data from secondary document analysis and those solicited from the semi-structured interviews. Furthermore, the researcher once worked in Zero2IPO, which is the most leading consulting company in venture capital and private equity investment, for more than four months in order to learn how they contact and solicit the investment information. The researcher suggested that with the cautious research design, the compatibility of the data from different sources might be substantially improved.

Besides, there are potential researcher biases in this study. The researcher bias and subjectivity are commonly understood as inevitable and important by most qualitative researchers. Primarily, the researcher once worked in a venture capital backed company for four years. The familiarity with this field helped the researcher to access more samples and gain more in-depth understandings. However, it also might lead to more researcher reflexivity due to the personal involvements of the researcher with the research subjects (Babcock, 1980). Besides the reflexive issues,

other researcher biases remain in this study. The fieldwork of this study was conducted by the author alone. Fieldwork with a single interviewer, who interacted with a limited number of people under a limited number of settings, is fully dependent on the communicating and interpreting skills of the researcher. At the same time, since venture capital investment is a new phenomenon in China, it is hard to avoid bias-free understandings and observations. The misunderstandings in terms of the definitions happened occasionally in the interviews. Finally, given the time constraints and the difficulties in accessing to the research subjects, some issues could not be discussed thoroughly. Like one of the interviewees said, '*If you want to know what we do in business, you have to give me one month to tell all the stories*'.

The researcher was aware of the potential research biases beforehand and made different arrangements to control the problems. Firstly, the researcher made many efforts on literature review before the interviews in order to shape the interview inquiry with a conceptual framework and reduce the weights of the personal judgements and opinions before the fieldwork. Secondly, the researcher tried to remind herself being aware of the role of the researcher and personally detached from the interviewees to some extent during the interviews. Thirdly, the researcher tried to access more public information in venture capital industry in order to have more background knowledge on the people and terminologies in this field. In this way, the researcher expected to reduce misunderstandings in exchange. Although various validating procedures have been carried out to ensure the quality of the fieldwork, researcher biases are unavoidable in qualitative studies. The systematic examinations based on quantitative data are therefore very valuable to improve the quality of this empirical study.

In summary, due to the knowledge, economic, time and other practical constraints, this study has several methodological limitations. It is expected that the problems can be solved better in future studies.

4.5.2 Methodological Findings of this Study

Methodological findings are summarized in this section. The findings are mainly lessons gained from the failures and difficulties in the field.

Above all, the primary lesson from the fieldwork is that researchers who conduct qualitative research should prepare for unexpected changes in the field,

particularly when the research subjects are organizations which may have serious confidential concerns. Qualitative studies which are based on close interactions with research subjects face dynamics in accessibility to the research subjects and research settings. In this study, the author adjusted data collection methods in the field. Consequently, the specific research questions were adjusted accordingly. According to the original research design, the author planned to conduct participant observations in a venture capital firm for 3-6 months for its advantages in gaining the richest real-time information on spot that is critically important for exploratory work. The researcher gained the access initially. However, all the meetings and negotiations were not open to the researcher due to the confidential concerns of the venture capital firm. It was very hard for the author to participate the research subjects as an insider. Therefore, participant observation plan was cancelled after days of trial, instead, interviews were chosen for gathering the qualitative data. The other change was about the interview methods. As previously mentioned the author originally decided to conduct structured interviews but adjusted to semi-structured interviews instead (see section 4). Meanwhile, the fieldwork schedule, the sampling strategies and sample size were also adjusted in the field.

In addition, difficulties in accessibility are always serious in field research. This includes physical and mental access to the research subjects. In this study, the major research subjects are venture capitalists who are busy all the time. As one of the interviewees said, *'I may be in Beijing this morning and then have dinner in New York at the same day, thank god for the time difference... well, time for me is the most luxury thing...'* So, although the researcher tried to access the interviewees through some very helpful connections, it was hard to ensure the appointments with them. In this study, over 200 phone calls together with over 400 emails were made to achieve the interview opportunities with the 37 individual venture capitalists.

Mental access is also very important. Building up a rapport with research subjects is crucial for gathering information under a natural context. Besides the widely mentioned mental access techniques, professional, educational and cultural background of the research subjects should be taken into considerations to pursue a satisfactory interview. Most of the informants in this study are Chinese overseas returnees who have gained higher education and working experience abroad. On the

professional side, they look more like ‘American’ than ‘Chinese’. However, under a more relaxed context, they are much more ‘Chinese’ in essence. Language, expressions and behaviours of the research subjects are influenced by their mixed background. Fortunately, the author share the educational and working experiences with most of the research subjects that makes it easier to communicate with them and interpret the interviews. This fieldwork experience suggests that knowing the background of the research subjects is important for deeper understanding and better explanations.

Furthermore, data analysis should be taken in the field rather than afterwards. This is especially important for qualitative research. Field research is vast, demanding and complicated. It involves literally hundreds of pages of interview transcripts, field notes and documents. As for this study, it happened that the author lost the thoughts gained from the field because the transcripts were not sorted on time. Although most of the interviews were tape-recorded, the author indeed encountered some confusion about the notes and the recording transcripts afterwards. The author tried to limit the problems with follow-up interviews, but it was very time-consuming and the missing was not fully avoided.

Finally, deciding when to stop data collection is important. There are no clear-cut guidelines on when a researcher should stop the data collection. In this study, the researcher tried to gain as many secondary documents as possible at first. However, at the later stage, there were huge amount of files collected that could hardly be sorted out by the researcher alone. Especially, amounts of the files were beyond the boundaries of this research that made the analysis much harder. The experience of this study suggests that limiting the data collection within the research boundary must be taken into account.

4.6 Summary

In the foregoing sections, the methodology and research design in this study were discussed. Based on the understandings of different research approaches in social studies and the nature of this research, the author suggest that a combination of both qualitative and quantitative approaches is appropriate methodology for this study.

The exploratory nature of this study determines that qualitative approaches are appropriate. Qualitative approaches are at the advantage of exploring and understanding that allows the questions and causality emerged from the field. Venture capital investment in China is almost not studied yet. It is a new area that needs to understand and analyze based on insightful explorations. At the same time, quantitative analysis is also important in this study. Quantitative approach is powerful in its logic structure, relative objectivity, generalization, replication, and comparability. The method is therefore employed to examine to what extent the qualitative findings represent the population and, how much the findings can be generalized. Moreover, based on the hard data, this study is comparable with the findings in the existing literature.

Accordingly, a multi-phased research design was constructed for this study. Unstructured and semi-structured interviews, secondary document analysis and commercial survey database are employed to collect the data for this study. The combination strategy entails the study with insightful understandings without losing the generalisability and objectivity.

Although the researcher tried to secure the validity and reliability of this study in various ways, the limitations and potential biases still remain due to the difficulties in data accessing. The weaknesses are especially seen in the sampling issues of both the qualitative and quantitative data and, the researcher biases in the field. While the biases are unavoidable, this study is the first research which provides both qualitative and quantitative evidence on China's venture capital investment with such a large number of samples. In the next four chapters, the major findings of this study are discussed in details.

Chapter 5 Institutions and Development of Venture Capital Investment in China

5.1 Introduction

As discussed in Chapter 3, new institutional economics has great power to understanding and explaining the development and mechanisms of venture capital investment. In addition, the unique institutions in China further call for attention from researchers while discussing China's venture capital investment. This chapter therefore introduces the trajectory of China's venture capital industry together with the economic, institutional and technological dynamisms in this country in the past twenty years. In addition, the institutional environments and arrangements under which China's venture capital industry has developed are also discussed. Based on the above discussions, the specific questions and hypotheses concerning the relationship between the institutions and venture capitalists' investment strategies are further clarified.

The information on the development of venture capital industry in China and the related institutions were obtained from two major sources. One is the secondary documents from various sources including the publicised reports and statistics released by governments and research institutions, business magazines, academic journals and website resources etc. The other one is the interviews with researchers, government officials and practitioners including venture capitalists and entrepreneurs.

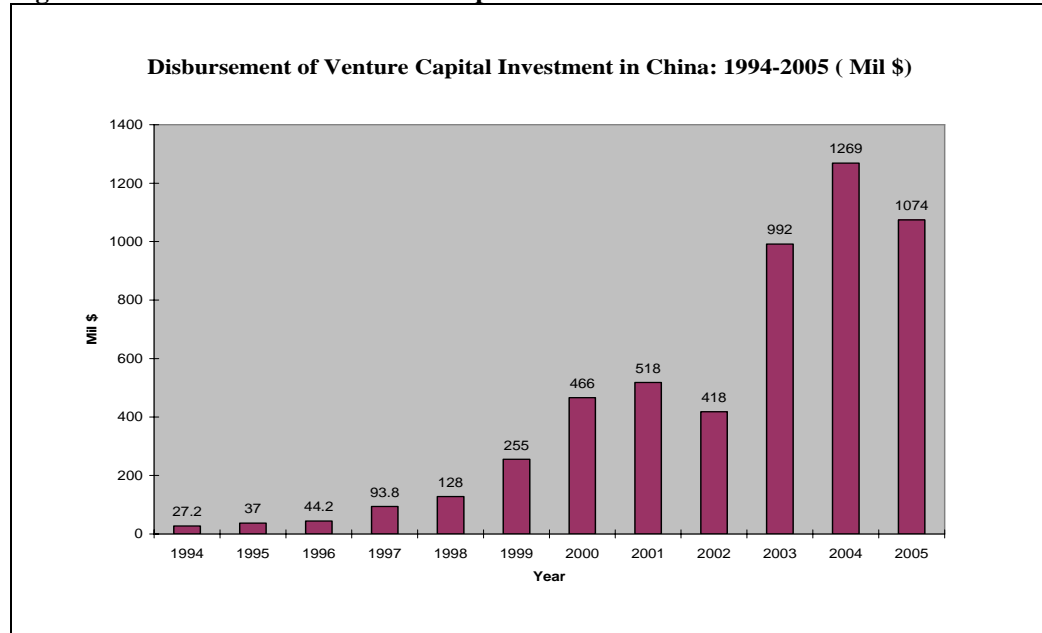
This chapter is organized as follows: the next section introduces the development trajectory of China' venture capital industry; section three focuses on institutional environments related to venture capital investment in China; section four introduces the institutional arrangements related to venture capital in China; the last section summarize this chapter with the clarification of the further research questions on venture capitalists' investment strategies.

5.2 The Development of China's Venture Capital Industry

This section documents the evolution of the venture capital industry and its interactions with economic, institutional, and technological changes in China. Starting from the mid-1980s, China's venture capital market is becoming one of the

most active venture capital markets in the world. By 2005, there were around 250 domestic and foreign venture capital institutions managing over \$16.9 billion funds that can be invested in Mainland China. As seen in Figure 5.1, the annual disbursements of venture capital investment in the Chinese have increased from virtually zero in the 1980s to a high of \$1.1 billion in 2005.

Figure 5.1 Disbursement of Venture Capital Investment in China: 1994-2005



Source: 1994-2001: CVCA Yearbook 2002; 2002-2005: Annual Venture Capital Report in China (Zero2IPO)

The development of China's venture capital industry, however, is not stand-alone but is path-dependent. It is a result of complicated interaction of different institutions including legal, political, economic and technological elements. Initiated by the central government in the mid-1980s, China's venture capital industry has experienced a dramatic transformation during China's transition from a centrally planned system to a more market-oriented economy.

5.4.1 Emergence of the Venture Capital Industry in China: 1985-1990

When initiated by the central government in the mid-1980s as part of science and technology reform, venture capital investment in China was little more than a discussion. It was a top-down initiative from the start. The pace of development in the first decade was very slow due to the economic and institutional constraints at that time.

In 1985, The Chinese Communist Party (CCP) and the State Council made the first effort to create a venture capital industry by releasing ‘The Decision on the Reform of the Science and Technology System’. The decision was considered a landmark of China’s S&T system reform and focused on linking economic growth with the development of S&T activities. Before the 1985 decision, China’s S&T system has long followed the Soviet Union’s model, which was centrally planned, hierarchical and state-funded. This decision suggested expanding funding channels for R&D activities and building up a more competitive funding system. Venture capital as a concept was introduced in this decision for the first time.

In response to this policy, the State Science and Technology Commission (SSTC) and the Ministry of Finance (MoF) established the China New Technology Venture Investment Corp., the first limited corporation in China focusing on venture capital investment, in 1986. This wholly government-backed venture capital institution was considered the official beginning of China’s venture capital industry.¹⁹ At the same time, some foreign private equity funds entered into China. In 1989, China Kezhao High-Tech Ltd., China’s first joint venture capital institution, was founded by China Merchants Holding (Hong Kong), the State Science and Technology Commission (SSTC) and the Commission of S&T and Industry for National Defence (CoSTIND). The venture capital firm was established to support the commercialization of S&T activities nominated by national high-technology programs (863 Program and Torch Program, etc).²⁰

However, China’s venture capital industry developed slowly, and its role in the S&T development was limited. Venture capital firms as institutional investment organizations were not legalized in China at that time; nearly all venture capital institutions were established as state-owned subsidiaries or spin-offs of related government agencies. Moreover, sources of funds were limited. Any form of private fund-raising by individuals and private firms without government approval was strictly prohibited. Therefore, the only fund sources for venture capital institutions

¹⁹ Formed with central government support, the company provided loans, equity investment, leasing and other assistance to technology companies. However, it deviated from its mandate by straying into real property and commodities speculations and was closed in 1997, with a loss amounting to 30 million RMB.

²⁰ 863 and Torch programs are two important projects supporting promising new hi-tech enterprises with low-interest rate loans.

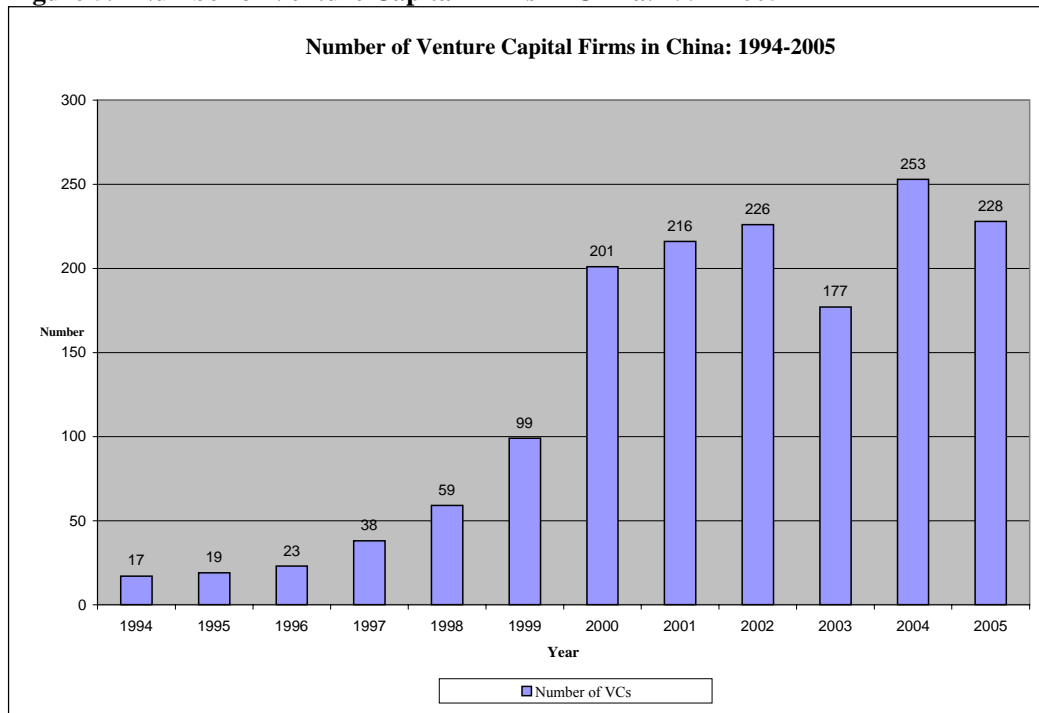
were central or local government bureaus, with the exception of a few joint venture capital institutions. The demand side of venture capital investment was also limited at that time. China's economic reform, which began in 1978, was originally targeted for agricultural reform. The development of non-agricultural sectors was sluggish; in addition, the cut of the state R&D expenditure, the serious 'brain drain', and the decline of international co-operation after the Tiananmen Square Event in the late 1980s and early 1990s also contributed to the slow growth of the venture capital industry.

Due to the lack of accurate data, it is hard to estimate the amount of investment during that period. Nonetheless, it is believed that there were less than ten venture capital institutions operating in China before 1991 (Feng, 2004). The majority were subsidiaries of central government agencies with limited funds. Venture capital was considered complementary financial resources of the federal appreciation for government-backed technological projects in SOEs.

5.4.2 The First Wave of China's Venture Capital Industry:1990-1997

The first wave of China's venture capital industry came in the early 1990s. The number of venture capital institutions, the amount of annual investment, and the source of venture capital funds steadily increased from 1990 to 1998. As seen in Figure 5.2, the number of venture capital firms increased from 17 in 1994 to 59 in 1998. The amount of annual investment rose to \$128 million in 1998 from \$27.2 million in 1994. In addition, government venture capital firms were not the only dominant players in the market. Large SOEs, including some financial institutions and foreign venture capital funds, began to set up venture capital investment business in China's market (White et al., 2002). According to CVCA report, in 1997, domestic corporate venture capital firms and foreign venture capital firms contributed to 11 per cent and 30 per cent of the total venture capital investment, respectively.

Figure 5.2 Number of Venture Capital Firms in China: 1994-2005



Source: 1994-2001: CVCA Yearbook 2002; 2002-2005: Annual Venture Capital Report in China (Zero2IPO)

China's economy and legal system encountered a dramatic turning point in the early 1990s. The Shanghai Stock Exchange and the Shenzhen Stock Exchange were officially opened in 1990 and 1991, respectively. Furthermore, Deng Xiaoping's Southern Tour in 1992 made up for the setback of the Tiananmen crackdown by further stressing the importance of economic reforms and the opening up policy. Alongside these economic and political changes, China's legal system also developed in the 1990s to better serve the socialist market economy. The first corporate law, the Company Law of the People's Republic of China was approved in 1994. It confirmed the legal rights of limited companies for the first time. In addition, a series of laws and regulations were issued to regulate S&T transformation and foreign investment. For example, the 'Science and Technology Promotion Law of China' was approved in 1993. These institutional improvements had a positive impact on the development of China's venture capital industry.

In 1991, the State Council announced the 'Authorization of National High-Tech Zones and Related Policies,' which allowed local governments to set up venture capital funds in high-technology zones. After this policy was issued, the State Science and Technology Committee, the Ministry of Finance, and the Industrial

and Commercial Bank of China set up the Technology Venture Development Centre. In 1992, Technology Venture Development Corporations were sequentially established by the local governments of Shenyang, Shanxi, Guangdong, Shanghai, and Zhejiang.

Moreover, CCP and the State Council announced ‘The Decision on Accelerating Scientific and Technological Progress’ in 1995, emphasizing the development of venture capital and establishing a technology venture capital system. In May 1996, the National People’s Congress approved the ‘Law Promoting the Industrialization of China’s Technological Achievements,’ which was the first legal statement allowing venture capital investment as a commercial activity and permitting funds to be raised from national or local governments, enterprises, organizations, or individuals to support technology ventures. Since then, more venture capital institutions were established by local governments and large SOEs. It enriched the source of venture capital investment. The newly established venture capital institutions mainly supported state-owned technological projects, making them more like government agencies than profit-driven businesses.

At the same time, more foreign venture capital institutions began to enter into China’s venture capital market with the economic and institutional progress. In 1993, ChinaVest invested in Zindart Co. Ltd.²¹ Additionally, in 1994, The Pacific Technology Venture Investment Fund of International Data Group (IDG) established three joint venture capital companies together with the Science and Technology Commissions of Beijing, Shanghai and Guangdong.²²

Most foreign venture capital funds worked as joint ventures with local governments or government-tied, state-owned venture capital institutions. Researchers suggest that the joint venture strategy was made by foreign venture capital firms to build relationships with local governments or large SOEs to help with deal sourcing, project governing, and administrative protection under weak commercial and legal systems in China (Bruton and Ahlstrom, 2003; Feng, 2004). However, the structure also had negative impacts on the investment of foreign venture capital funds. Taking the size of newly raised funds as a performance proxy,

21 Zindart was traded in the form of American Depositary Shares (ADRs) in NASDAQ in 1997.

22 Both ChinaVest and IDGVC are venture capital institutions based in the United States. The two venture capital institutions are among the first FVCFs entered into China that have made very successful investments.

Feng (2004) finds that the performance of most foreign venture capital firms was far from satisfactory in the mid-1990s.

It is clear that, in the first years of development of the venture capital industry, central and local governments played a key developmental role, with a succession of different policy statements. Besides the policies on venture capital development, other important government initiatives on economic reforms, S&T development, and regulatory institutional construction also contributed to the development of China's venture capital market. Venture capital did not develop in isolation but resulted from institutional dynamics and other aspects of the economy.

5.4.3 The Breakthrough of Venture Capital in China: 1998-2001

The breakthrough of China's venture capital industry did not come until the late 1990s. As seen in Figure 5.1 and Figure 5.2, both the number of venture capital institutions and the amount of investment doubled in 1999. The sharp increase continued in the following two years. The annual investment reached a peak of \$518 million in 2001. In addition, a group of successful venture capital backed companies issued public offerings in international capital markets.

China experienced remarkable institutional and technological progress in the late 1990s. The constitutional right of the private sector was recognized for the first time by the Second Session of the Ninth NPC with a statement that 'private sectors are major components of socialism market economy' in 1999. This change significantly impacted the rapid development of private companies and the confidence of investors. Furthermore, the global Internet boom was spreading to China at that time. China made an effort to develop information technology and developed the infrastructure in the second half of the 1990s. Additionally, an increasing number of overseas Chinese students who had working experience in the high-technology industry in western countries began returned at that time.

Policies related to the venture capital industry developed during the same time period. In 1998, the 'Proposal on Developing China's VC Industry' was presented by the Central Committee of Chinese National Democratic Constructive Association at the Ninth Conference of the National People's Congress. It attracted serious attention from policy makers and became the 'Announcement No.1' that year. A series of policies followed to promote the venture capital industry. In October

1998, the State Science and Technology Committee submitted the ‘Proposal for encouraging IPO of hi-tech enterprises’ to the China Securities Regulatory Committee (CSRC), suggesting the reduction of requirements for issuing hi-technology enterprises in China’s primary security markets and encouraging venture capital backed companies to issue in foreign stock markets. This proposal officially raised the question of whether China should set up its own secondary board. In December 1999, the State council approved the ‘Proposal on setting up China’s venture capital investment mechanism,’ which was jointly submitted by seven different governmental bureaus.²³ Additionally, the first discussion regarding the drafting of the Investment Fund Law was held in the same year. As a result, venture capital institutions became officially legitimate in China.

In 2001, the Ministry of Foreign Trade and Economic Cooperation (MoFTEC), together with the Ministry of Science and Technology (MoST) and the State Administration for Industry and Commerce (SAIC) issued the ‘Provisional Regulations on the Establishment of Foreign Invested Venture Capital Investment Enterprises’ (the ‘VC Regulations’). By clarifying the registration requirements for foreign venture capital institutions, the regulation was the first effort from China’s government to confirm the legitimacy of foreign venture capital firms in China, although most of the requirements in this regulation were not really feasible.²⁴

With the institutional and technological progress, the sources of venture funds have been enriched substantially. Local governments, like the local Science and Technology Commissions and the Bureaus of Finance, began to establish venture capital institutions and acted as major shareholders. According to CVCA, by the end of 2001, over 34 per cent venture capital institutions in China were government-funded venture capital firms. In addition, a group of university-funded and large SOE-funded venture capital firms emerged and developed rapidly. They accounted

23 The seven government bureaus are the State Science and Technology Committee, the State Planning Committee, the State Economic and Trading Committee, the Ministry of Finance, the People’s Bank of China, the State Administration of Taxation of China, and the China Securities Regulatory Committee.

24 According to the regulation, foreign venture capital firms must pass through a strict, time-consuming approval process at various government agencies for registration. In addition, the only legal organizational form for foreign venture capital firms in China is the limited company, which is different from the widely-used limited partnership governance structure. Furthermore, the rigid requirements for registered capital (at least \$20 million; 15 per cent of this amount must be paid within 3 months after the issue of the business license; the remainder must be paid in within 3 years whether or not attractive investments are available) are also constraints for foreign venture capital firms.

for 37 per cent of venture capital institutions in 2001. At the same time, a new wave of arrival of foreign venture capital funds occurred. By the end of 2001, one third of venture capital institutions in China were foreign venture capital firms. According to a report by Zero2IPO, more than 40 foreign venture capital firms invested \$258 million in 45 deals in China in 2001.

5.4.4 The Second Wave of China's Venture Capital Industry: 2003-present

The second significant wave of China's venture capital industry occurred in 2003 after a short-term decline in the previous year resulting from the global crash of 'Dot Com bubble' in 2000. However, it did not last long, and the degree of the decrease was not serious. On the other hand, the number of venture capital institutions continued increasing in 2002. The industry saw even more striking development after 2003. The market saw record annual investments of \$992 million in 2003 and \$1269 million in 2004. Even though the market was encountered a temporary setback again in 2005, when the annual disbursement decreased to \$1.1 billion as a result of two regulations on exchange currency control promulgated by the SAFE earlier that year, the newly raised funds set records to over \$4 billion in 2005. According to the newest released report, the annual disbursement of venture capital investment in China raised to \$1.7 billion and \$2.4 billion in 2006 and 2007 respectively.

China experienced even more striking economic growth and institutional dynamisms after 2000. The average growth rate of the GDP increased to 9.5 per cent during the period of 2001 to 2005 (from 8.25 per cent during 1996 to 2000). At the same time, high-technology industries, especially the information, communication, and semi-conductor industry have grown significantly. The production of high-technology industries accounted about 18 per cent of the total GDP in 2004. The volume of high-technology products as a percentage of total export in 2005 rose to 28.6 per cent, which was a significant growth from four per cent in 1991.

On the policy making side, fundamental progress occurred in the new century. Primarily, acknowledging the increasing importance of SMEs to China's economy, the 'Law for promoting China's SME' was approved in June 2002. This law focuses on establishing a support system for developing SMEs, including simplifying the administrative procedures in registration and providing preferred tax treatment and

bank loans to SMEs, especially innovative SMEs, which are the major targets and source of demands for venture capital investment.

More importantly, the constitutional rights of the private sector were fully and clearly recognized in 2004. The Tenth National People Congress (NPC) held in 2004 confirmed that ‘the state encourages, supports and guides the development of the private sector’. Private property was also legalized for the first time by a statement that ‘any lawful private property should not be encroached upon’. As a consequence, the company law was revised in August 2004 and October 2005. In the amended version, the incorporation threshold was substantially lowered, and the value of non-cash assets, including the value of intellectual property, was further recognized. In addition, a variety of changes were made to improve corporate governance, including the reorganization of cumulating voting rights of minority shareholders and the rights of shareholders to check accounting information.

Capital markets have also developed since 2000. First, the long-expected secondary stock market, the Small and Medium Enterprise Board of Shenzhen Stock Exchange opened in June, 2004. Second, the main boards of the Shenzhen and Shanghai Stock Exchange fully opened to the private sectors in 2003.²⁵ The development of capital markets shows the government’s determination in encouraging SMEs and widens the exit channels for venture capital investment, especially investments made by domestic venture capital firms.

Furthermore, the regulations guiding organizational structures and the registration of venture capital institutions have significantly progressed. In January 2003, the amendment of the ‘Provisional Regulations for Establishment of Foreign-Invested Venture Capital Investment Enterprise’ was approved. This version further clarified registration procedures for foreign venture capital firms and reduced the

²⁵ The quota system was established in the early 1990s. Under the quota system, the IPO quota was allocated to local governmental agencies each year. These agencies could use their quota to recommend that a firm be listed to the China’s Securities Regulatory Commission (CSRC). The CSRC usually approved these recommendations. Thus, the most important step in gaining approval for an IPO on China’s stock exchanges was to receive a recommendation from a Chinese government agency that had an IPO quota. SOEs were heavily favored under the quota system. It was highly unlikely for joint venture firms in which international venture capitalists had invested to gain IPO approval. The domestic stock markets were not fully open to non state-owned enterprises until 2003, although the quota system was officially abandoned in 2000. Listing in the domestic stock market was very difficult for venture capital backed companies, if not impossible, before 2003.

requirements for capital utilization.²⁶ Rules regulating domestic and foreign venture capital firms are also becoming more uniform. The ‘Interim Administrative Measures for the Start-up Investment Enterprises’ was approved by the State Council in September 2005 and promulgated by ten different government agencies in November 2005. The regulations established partially uniform rules for both domestic and foreign venture capital firms in terms of preferential treatment and financial support. More importantly, the regulations confirmed the legitimacy of using convertible security and preferred stock by both domestic and foreign venture capital firms. The regulations introduced an autonomous registration mechanism of institutional investors.²⁷ The most recent fundamental breakthrough was the confirmation of the legitimacy of the limited partnership. The amendment to the ‘Partnership Enterprise Law of the People's Republic of China’ was approved at the 23rd session of the Standing Committee of the 10th NPC in Aug 2006. The limited partnership as an organizational form was officially legalized for the first time in China at that time. The regulation was scheduled to take effect in June 2007.

With the above mentioned institutional and economic development, investment confidence in the market recovered in 2003. The market boosted record annual investments in 2004. In addition, a new wave of foreign venture capital fund inflow occurred after 2003. In particular, a group of mainstream Silicon Valley’s venture capital funds entered into the market exactly at the time when venture capital around the world was in a recession. The foreign venture capital firms made some remarkable investments in 2002.²⁸ As seen in Figure 5.3, the annual investment by foreign venture capital firms was more than 80 per cent of the total venture investment in 2003.

At the same time, with the accumulated experience and knowledge in China, foreign venture capital firms have found some ways to avoid institutional and

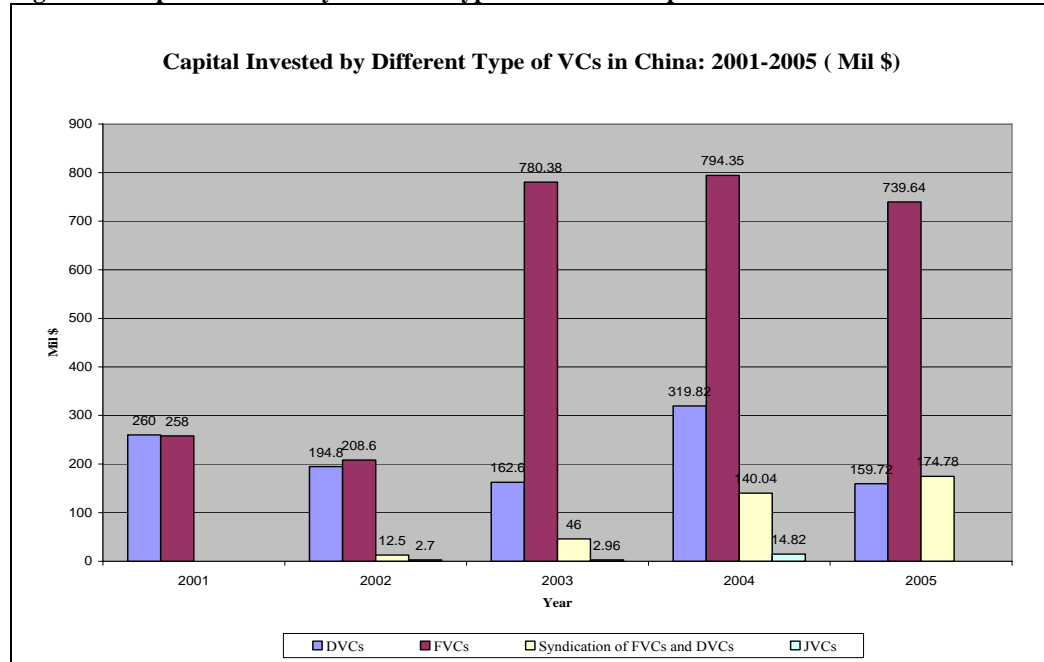
26 According to this revised version, the capital from foreign investors should be exploited within 5 years. It is much more relaxed than the 2001 version, which required the utilization of capital within 3 years.

27 The registration of FVCs is still governed by the ‘Provisional Regulations for Establishment of Foreign-Invested Venture Capital Investment Enterprise’ approved in 2003 that the establishment of foreign venture capital firms is still subject to approval by the Ministry of Commerce, the successor of the MOFTEC.

28 For example, JAFCO, the largest VC institution in Japan, invested \$10 million in 3721.com. in 2002. Other examples include the \$60 million invested in Harbour Networks by Warburg Pincus and DragonTech Ventures, and, the \$58 million investment in Beijing United Platform Technologies by National Enterprise Associates and Doll Capital Management etc.

economic burdens and to work more efficiently and independently from domestic venture capital firms. Since the late 1990s, the joint venture model has been gradually abandoned by foreign venture funds. Currently, the majority of foreign venture capital firms are incorporated overseas, and the operation of the funds is conducted offshore. That is, they invest in China through representative offices in the Chinese mainland. At the same time, foreign venture capital firms also register their portfolio companies overseas as offshore holding companies, with the decrease of investment in state-owned enterprises (Feng, 2004; Bruton and Ahlstrom, 2003). Both domestic and foreign venture capital firms have paid more attention to young high-technology companies which were mainly new-established private firms since the late 1990s. According to the annual report provided by Zero2IPO, over 70 per cent of annual investments have been made in high-technology industry since 2002.

Figure 5.3 Capital Invested by Different Types of Venture Capital Firms in China: 2001-2005

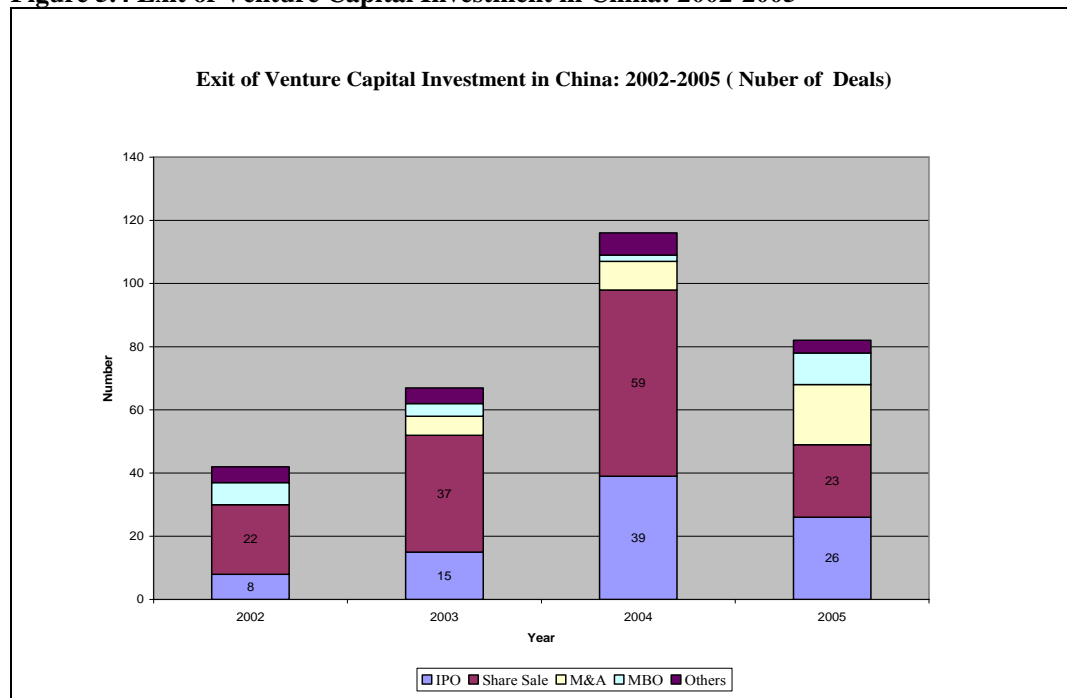


Source: Annual Venture Capital Report in China: 2002-2006 (Zero2IPO)

In addition, China's venture capital market saw more successful exit cases in the 2000s. Divestment through the IPO has greatly increased since 2003. Following the visible IPOs of AsiaInfo and UTStarcom on NASDAQ in the late 1990s, the overseas listing has become the most attractive way for the exit of venture capital investment. There were 15, 39, and 26 venture capital backed companies which issued public offerings in 2003, 2004, and 2005, respectively (see Figure 5.4). More

than three fourths of them were backed by foreign venture capital firms and listed on overseas stock markets. Additionally, the exit channel was further broadened in 2004 when the long-expected secondary board, the Small and Medium Enterprise Board of Shenzhen Stock Exchange opened in June 2004. Five domestic venture capital backed companies were listed at that market in that year. By August 2006, there were 14 venture capital backed companies listed in China's secondary board that opened a door for exit of domestic venture capital investment, although this is a relatively small number compared to the number of companies listed in overseas stock markets.

Figure 5.4 Exit of Venture Capital Investment in China: 2002-2005



Source: Annual Venture Capital Report in China (Zero2IPO)

However, these institutional improvements were by no means always smooth. It was proved to be a typical 'trial by error' process. For instance, SAFE issued a circular on certain issues in relation to the Foreign Exchange Registration for Outbound Investment by PRC Residents in January 2005 ('Circular 11') and another circular on Foreign Exchange Registration for Merger and Acquisition by Offshore Entities in April that year ('Circular 29'). These two circulars tried to develop a more clarified framework, which regulates the movement of assets and control of domestic assets by foreign investors. By tightening the administrative procedures for

registration and approval of cross-border capital investment, the circulars significantly constrained the ability of PRC residents and non-Chinese citizens to set up and hold shares in the offshore companies. Although the intent of these regulations is to control the fraudulent cross-border capital flows by PRC residents, the regulations had a significant impact on foreign venture capital investment, which is heavily engaged in offshore investment, cross-border sales and overseas IPO. According to the report provided by Zero2IPO, the majority FVCs suggested that these two regulations indeed led serious concerns to them. As a result, the venture investment in the first three quarters of 2005 dropped substantially. Realizing the negative impact of the two circulars, in October 2005, SAFE issued a new circular on ‘Relevant Issues Concerning Foreign Exchange Control on Domestic Residents’ Corporate Financing and Roundtrip Investment through Offshore Special Purpose Vehicles’ (‘Circular 75’), effective since November 1, 2005. Circular 75 confirms that the use of offshore special purpose vehicles as holding companies for PRC investments is permitted as long as proper foreign exchange registrations are made with SAFE. It is believed that the sharp increase of disbursement of venture capital investment in the second half of year 2005 and the increase of new fund raised in that year are closely related to the institutional dynamics in that year.

Table 5.1 summarizes the institutional trajectory and the development of China’s venture capital investment. In general, China’s venture capital market has seen rapid development in the past decade. As shown in Table 5.1, as major initiators, central and local governments have played important roles in the development of China’s venture capital industry. They act not only as policymakers and regulators but also as fund providers and managers. Even though the weight of government and domestic venture capital funds has substantially dropped in recent years, there are still over 120 domestic venture capital institutions directly or indirectly funded by governments or large SOEs operating in the market, making up around 20 per cent of the total investment annually. At the same time, foreign venture capital funds have shown a great enthusiasm for China’s market in recent years, although the institutional environments for them are ambiguous and weak. They have contributed to about 80 per cent of annual venture investment in China since 2003.

Table 5.1 The Development of China's Venture Capital Industry

		Government Policy and Regulations	Business Events
<i>1985-1990: The Emergence of Venture Capital Investment in China</i>	1985	1. 'The Decision on the Reform of the Science and Technology System' was released by CCP and the State Council. 2. China's first patent law was enacted.	
	1986	1. 863 High-Tech Program was launched	China New Technology Venture Investment Corp., the first limited corporation focusing on venture capital investment was funded by SSTC and MoF.
	1987		China's first incubator was established by local government in Wuhan city, Hubei Province
	1989		China's first Sino-foreign joint venture in venture capital, Kezhao High-Tech Ltd., was established jointly by China Merchants Holding (Hong Kong), SSTC and CoSTIND.
	1990	1. Shanghai Stock Exchange was opened	
<i>1991-1997: The First Wave of China's Venture Capital Industry</i>	1991	1. Shenzhen Stock Exchange was opened. 2. The 'Authorization of National High-Tech Zones and Related Policies' was announced. It allows local governments to set up venture capital funds in high-tech zones.	The Technology Venture Development Center was established by SSTC, MoF and the Industrial and Commercial Bank of China.
	1992	1. Deng Xiaoping's Southern Tour in 1992 further stressed the importance of economic reforms and the opening up policy.	Technology Venture Development Corporations was established by local governments in Shenyang, Shanxi, Guangdong, Shanghai, Zhejiang.
	1993	1. The 'Science and Technology Promotion Law of China' was approved.	ChinaVest invested in Zindart, a company that listed its ADRs on NASDAQ in 1997.
	1994	The first corporate law, the Company Law of the People's Republic of China was approved in 1994.	International Data Group (IDG) established three venture capital firms with the local S&T commissions of Beijing, Shanghai and Guangdong.
	1995	CCP and State Council announced 'The Decision on Accelerating Scientific and Technological Progress'.	
	1996	The 'Law Promoting the Industrialization of China's Technological	At least 20 VCFs were established by S&T

		Achievements' was approved. It is the first legal statement allowing venture capital as a commercial activity.	commissions and finance departments of local governments.
	1997		<ol style="list-style-type: none"> 1. China's first VCF, founded in 1986, was declared bankrupt and closed by the People's Bank of China. 2. AsiaInfo received US\$18 million investment from 3 foreign VCFs. 3. Sohu.com predecessor firm received US\$6.5 million investment from FVCFs.
1998-2001: The Breakthrough of China's Venture Capital Industry	1998	<ol style="list-style-type: none"> 1. MoST submitted the 'Report on Establishing China's S&T Venture Capital System' to the State Council. 2. The 'Proposal on Developing China's VC Industry' was presented by at the Ninth Conference of the National People's Congress. 3. SSTC submitted the 'Proposal for encouraging IPO of hi-tech enterprises' CSRC, suggesting the reduction of requirements for issuing hi-technology enterprises in China's security markets and encouraging venture capital backed companies to issue in foreign stock markets. 	<ol style="list-style-type: none"> 1. A wave of VCFs were established by local governments and large corporations. 2. A group of newly established high-technology companies received investments from FVCFs.
	1999	<ol style="list-style-type: none"> 1. The constitutional right of the private sector was recognized for the first time by the Second Session of the Ninth NPC. 2. In December 1999, the State council approved the 'Proposal on setting up China's venture capital investment mechanism,' which was jointly submitted by seven different governmental bureaus 3. Additionally, the first discussion regarding the drafting of the Investment Fund Law was held in the same year. As a result, venture capital institutions became officially legitimate in China. 	<ol style="list-style-type: none"> 1. VCFs became officially legitimate in China. 2. The number of venture capital institutions and the amount of investment doubled in 1999. 3. Beijing Venture Capital Association was established.
	2000	The State Council announced the 'Policy for Encouraging the Software Industry and Promoting the IC Industry'.	AsiaInfo and UTStarcom were listed on NASDAQ.
	2001	The 'Provisional Regulations on the Establishment of Foreign Invested Venture Capital Investment Enterprises' (the 'VC Regulations'), which clarifies the registration requirements for foreign institutional investors, was issued. It first confirmed the legitimacy of foreign venture capital firms in China.	<ol style="list-style-type: none"> 1. The annual investment reached a peak of \$518 million. 2. China's venture capital market (including Hong Kong) ranked as the 2nd largest in the world in terms of annual investment. 3. A new wave of arrival of FVCFs occurred. More than 40 foreign venture capital firms

			<p>invested \$258 million in 45 deals in China in 2001.</p> <p>3. A group of university-funded and large SOE-funded VCFs emerged and accounted for 37 per cent of venture capital institutions in 2001.</p>
2002- present: The Second Wave of China's Venture Capital Industry	2002	The 'Law for promoting China's SME' was approved in June, simplifying the administrative procedures in registration of SMEs and providing preferred tax treatment to SMEs.	<p>1. The annual investment dropped a little bit with the crash of 'DOT COM bubble'.</p> <p>2. China Venture Capital Association (CVCA) was registered in Hong Kong.</p>
	2003	The amendment of the 'Provisional Regulations for Establishment of Foreign-Invested Venture Capital Investment Enterprise' was approved in January. It further clarified the registration procedures for foreign venture capital firms and reduced the requirements for capital utilization.	<p>1. The annual investments of venture capital reached to \$992 million.</p> <p>2. A group of mainstream Silicon Valley's venture capital funds entered into China and made some remarkable investments.</p> <p>3. 15 venture capital backed companies issued public offerings.</p>
	2004	<p>1. The constitutional rights of the private sector were fully and clearly recognized at The Tenth National People Congress.</p> <p>2. The company law was revised in August. In the amended version, the incorporation threshold was substantially lowered, and the value of non-cash assets, including the value of intellectual property, was further recognized.</p> <p>3. The long-expected secondary stock market, the Small and Medium Enterprise Board of Shenzhen Stock Exchange opened in June.</p> <p>4. The main boards of the Shenzhen and Shanghai Stock Exchange fully opened to private sectors.</p>	<p>1. The annual investments of venture capital reached to \$1269 million.</p> <p>2. 39 venture capital backed companies issued public offerings. Among these companies, five domestic venture capital backed companies were listed at the Small and Medium Enterprise Board of Shenzhen Stock Exchange market.</p>
	2005	<p>1. The 'Interim Administrative Measures for the Start-up Investment Enterprises' was approved by the State Council in September. It established partially uniform rules for both domestic and foreign VCFs in terms of preferential treatment and financial support. It also confirmed the legitimacy of using convertible security and preferred stock by both domestic and foreign VCFs.</p> <p>2. SAFE promulgated 'Circular 11' and 'Circular 29' in January and April respectively that tightened the administrative procedures for registration and approval of cross-border capital investment.</p> <p>3. SAFE issued Circular 75 in October, which confirmed that the use of</p>	<p>1. The market was encountered a temporary setback with the annual disbursement decreased to \$1.1 billion.</p> <p>2. 26 venture capital backed companies issued public offerings.</p> <p>3. The investment disbursement in the second half year was increased, and the newly raised funds set records to over \$4 billion by the end of 2005.</p>

		offshore special purpose vehicles as holding companies for PRC investments is permitted as long as proper foreign exchange registrations are made with SAFE.	
	2006	The amendment to the 'Partnership Enterprise Law of the People's Republic of China' was approved in August. The limited partnership as an organizational form was officially legalized for the first time.	1. The annual investment reached to \$1.7 billion. 2. By August, there were 14 venture capital backed companies listed in the Small and Medium Enterprise Board of Shenzhen Stock Exchange.
	2007	The regulation on recognizing limited partnership as an organizational structure was taken effect in June.	The annual disbursement of venture capital investment rose to \$2.49 billion.

5.3 Institutional Environments in China

From the brief introduction on the history of China's venture capital market, it can be seen that the institutional environments under which the venture capital industry develops in China are structurally different than those in the United States or any other western country. This section summarizes the major characteristics of the institutional environments that have shaped the evolving trajectory of China's venture capital industry.

5.3.1 Regulatory Institutions in China

The construction of regulatory institutions in China is underdeveloped in general; the problem is even worse for related regulations on non-state owned organizations and financial institutions. China does not have a comprehensive legal system to address the legal issues related to the establishment and operation of venture capital funds, due to the legacy of the central planning system.

5.3.1.1 Weak Protection of Property Rights and Private Sector in China

The protection of property rights has long been weak in China. The protection of property rights is considered critical for finance and entrepreneurship and, consequently, for venture capital investment (Hart and Moore, 1990; Johnson et al., 1999). Even though the private business has played an important role in China's economy since the 1980s, it developed slowly. Private enterprises with more than seven employees could not be legally registered until 1988, when the First Session of the Seventh NPC recognized the private sector as 'a complement to the economy' for the first time. However, it also stated that the legal rights of the private sector should be 'controlled by the state' so that private sectors did not gain a full constitutional right. The constitutional rights of the private sector and the property right were not fully recognized until 2004. Feng (2004) suggests that the dynamics of the protection for property rights heavily influenced the investment choice of foreign venture capitalists in China. In the early 1990s, international venture capitalists invested mainly in SOEs, since the interests of private firms were not well protected. With the increasing protection of private firms and property rights, international venture capitalists gradually turned to private firms after 2000. However, the constitutional rights of the property rights were fully recognized only two years ago. However,

researchers have documented various distortion cases of property rights in China in recent years due to weak law enforcement and other administrative inferences. It is therefore questioned whether the lack of protection of property rights may have an impact on venture capitalists' investment strategies in China.

5.3.1.2 Weak Corporate Governance Rules in China

Corporate governance rules are also weak in China. Corporate governance is a set of internal rules that focus on how to motivate the stakeholders and align their actual interests to achieve the overall goals in a corporation. The mechanisms and controls of corporate governance are designed to reduce the inefficiencies that arise from moral hazard and adverse selection. Researchers suggest that the legal framework is an important factor influencing corporate governance (La Porta et al., 1998). As private equity investors, venture capitalists are active participants in the management of their portfolio companies to control agency costs and uncertainties. The mechanisms employed in venture capital investment are mainly embedded in strong corporate governance.

Not until the middle of 1990s did China promulgate rules on corporate governance that serve the market oriented economy. The most important legal sources of corporate governance rules are company law, promulgated in 1994, and security law, promulgated in 1998, in China. However, the laws did not take the features of venture capital investment into consideration until the latest amendments in 2005.

Convertible security was not legal in China until recently. In western countries, convertible security is widely used by venture capitalists to separate control rights from cash flow rights. Venture capitalists attain control rights through convertible preferred securities, even though, in most cases, they only have the minority of ownership. In this way, venture capitalists try to retain the downside protection of their investment (Kaplan and Per Stromberg, 2003; Hellmann, 1998). Convertible security was not recognized in China until 2005 when the 'Interim Administrative Measures for the Start-up Investment Enterprises' was deliberated and approved by the State Council. The regulations confirmed the legitimacy of the use of convertible security and preferred stock.

The other major issue is that limited partnership as an organizational structure is currently illegal. As discussed, researchers suggest that a limited partnership provides powerful incentives to venture capitalists and thus mitigates potential agency problems in fund management. In August 2006, the limited partnership was officially and legally recognized in the amendment of 'Partnership Enterprise Law of the People's Republic of China' that was approved at the 23rd session of the Standing Committee of the 10th NPC. The regulation is scheduled to take into effect in June 2007.

Before 2005, the recognition of the value of non-cash assets, including intellectual property, was limited. Additionally, the cumulating voting rights of minority shareholders and the rights of shareholders to check accounting information were not legally recognized until 2005. Venture capital investment mainly targets human capital. The core value of the investment is therefore embedded in non-cash assets. At the same time, they normally syndicate their investment with other venture capitalists and do not hold the majority shares. Thus, the need for recognizing the non-cash assets and cumulating voting rights of minority shareholders are directly related to how venture capitalists protect their own interests.

Even though many changes have been made to improve the rules of corporate governance since 2000, problems remain. For example, China's laws and regulations still forbid the separation of ownership and control that is widely used in venture capital contracts in the United States. Shareholders' veto rights are not legally recognized either.

5.3.1.3 Weak Protection of Intellectual Property Rights

Intellectual property rights are not well-protected in China. Since young high-technology companies are more favoured by venture capitalists, researchers suggest that the protection of intellectual property rights is important for venture capital process (Silverman, 1989). Even though China has enacted legislation on patents, trademarks, copyrights, integrated circuit design layout, and computer software since the 1980s, theft of intellectual property remains a major problem. According to the Office of the United States Trade Representative (USTR), copyright piracy was estimated at between \$2.5 billion and \$3.8 billion a year, and infringement levels in virtually all categories of intellectual property were 90 per cent or higher in 2004.

These problems may discourage entrepreneurship and venture capitalists from investing in R&D intensive companies.

5.3.1.4 Restrictions on Foreign Institutional Financiers

Even though China has made many efforts to attract foreign direct investment since the late 1970s, restrictions on foreign institutional financiers are severe due to policies on foreign currency control. First, foreign institutional investors are not allowed to raise funds in China; they must incorporate and raise money overseas. The major fund sources of foreign venture capital funds are pension funds, insurance corporations, and university endowments; this is similar to the practice in the United States. However, foreign venture capital institutions operating in China may face additional constraints, since international investors may be reluctant to invest in funds that focus on an emerging market like China due to lack of knowledge and confidence in the market.

Moreover, the requirements for registering as a Qualified Foreign Institutional Investor (QFII) are so rigid and complex that most foreign venture capital firms cannot satisfy them. For example, according to the ‘Provisional Regulations on the Establishment of Foreign Invested Venture Capital Investment Enterprises’ issued in 2001, foreign venture capital institutions must undergo a strict approval process with various government agencies for registration. In addition, the requirements for registered capital are also rigid: at least \$20 million and 15 per cent of this amount must be paid in within three months after the issue of the business license; the remainder must be paid within three years whether or not attractive investments are available. A 2003 amendment allowed capital from foreign investors being exploited within 5 years that is more relaxed compared with the 2001 version. However, the requirements for registering as QFII remain complex and time-consuming. This restriction leads to the offshore registration of foreign venture capital firms that invest in China’s venture capital market.

5.3.1.5 Weak Law Enforcement in China

Weak law enforcement in China is also a major concern of financiers. An efficient and independent judicial system is considered as critical to protect external investors’ interests (La Porta et al., 1998). The judicial system is not independent in China, although the situation has improved since the mid-1990s. Law enforcement

has long been under the leadership of administrative bureaus in China. Scholars suggest that lack of professional judicial expertise, weak enforcement, and serious corruption have made the judicial system unreliable for enforcing contracts in China (Allen et al., 2005). Feng (2004) finds that foreign venture capital firms frequently employed joint venture strategies to reduce transaction costs in China before 1995. Foreign investors aimed to economize transaction costs by providing embedded interests to their local partners (e.g. large SOEs or local government-tied agencies) to encourage their local partners to conduct relation-specific investments. However, Feng notes that the performance of these joint funds was not satisfactory, since the local partners were not profit-maximizers. Consequently, the governance structure was given up lately.

5.3.1.6 Underdeveloped Capital Market in China

Capital markets are also underdeveloped in China. A developed capital market has been evidenced as one of the most important determinants of an active venture capital market (Jeng and Wells, 2000; Black and Gilson, 1998, Lerner, 1994). IPO is the most favourable channel of divestment by venture capitalists for its high return rate and high liquidity. However, China's domestic capital markets are not friendly to companies backed by venture capital.

The two main boards of stock markets in China were not fully open to joint ventures and private companies until 2003, although the quota system²⁹ was formally abandoned in 2000. Although the secondary stock market, i.e. Small and Medium Enterprise Board of Shenzhen Stock Exchange opened in June 2004, the listing requirements are difficult for young firms to satisfy. The overall design of the SME Board may be generalized as 'two remain' and 'four separate'. That is, listing standards and laws and regulations governing the main board still apply to the SME Board. The board operates under separate trading and regulatory systems, separate

²⁹ The quota system was established in the early 1990s. Under the quota system, an IPO quota was allocated to local governmental agencies each year. These agencies could use their quota to recommend to the China's Securities Regulatory Commission (CSRC) that a firm be listed. The CSRC usually approved these recommendations. Thus, the most important step in gaining approval for an IPO on China's stock exchanges was to receive a recommendation from a Chinese government agency that had IPO quota. SOEs were heavily favored under the quota system. It was highly unlikely for either joint venture firms or private firms in which venture capitalists had invested to gain IPO approval. The domestic stock markets were still not fully open to non state-owned enterprises until 2003, although the quota system was officially abandoned in 2000. Listing in the domestic stock market was very difficult for venture capital backed companies, if not impossible, before 2003.

stock coding, and separate stock price indices. Therefore, issuing IPO in domestic capital markets is difficult for venture capital backed companies that are mainly young enterprises without profit records. The Chinese government has not formally allowed foreign-invested enterprises to be listed on China's stock markets. Moreover, the regulatory environments of the markets have long been a concern for practitioners and researchers (Allen et al., 2005); this may also discourage venture capital firms to list their portfolio companies on China's domestic capital markets.

Listing on overseas capital markets is not easy for companies backed by domestic venture capital firms. The approval procedures are heavily bureaucratic and time-consuming. Even when domestic venture capital backed companies successfully pass through the administrative hurdles, the lack of experience in overseas capital markets might negatively impact on the performance of the IPO and consequently on the return rate of the divestment.

'Red chip' offshore listings have been a unique arrangement for divestment of foreign venture capital investment in China. Foreign venture capital firms have been relying on the use of offshore holding companies as their China investment vehicles since the mid-1990s.³⁰ Offshore companies are typically located in tax efficient jurisdictions such as Bermuda, the Cayman Islands, or the British Virgin Islands. Rather than investing in a Chinese portfolio company directly, foreign venture capital and private equity funds commonly make their investments in an offshore holding company and then establish a foreign-invested enterprise (FIE) in China. In this way, they move ownership or control of the PRC-based assets to the offshore holding company and then go for an offshore financing transaction. By doing this, the company backed by foreign venture capital firms can issue IPO in an overseas market or sell shares to any international businesses without approval from the Chinese government.

5.3.1.7 Issues in Public Policies and the Role of Government

Realizing the problems with the current legal system that regulate business exchanges and the financing system, the government has tried to employ public

³⁰ Even though the 'red chip' offshore listing encountered setbacks due to the two regulations on exchange currency control promulgated by SAFE in 2005 that set forth strict approval-based investment requirements, it was re-commenced with the policy shifts in China's foreign exchange control regime that later took place.

policies and administrative measures as complements to the commercial legal system. However, the stability, consistency, and transparency of these public policies are problematic. For example, the State Administration of Foreign Exchange (SAFE) promulgated three different Circulars with different regulatory details concerning the establishment of overseas companies by domestic enterprises and the transfer of domestic assets or equity to overseas companies within 10 months in 2005 (e.g. Circular No.1 in Jan, Circular No.29 in April and Circular No.75 in Oct.). Besides, the manoeuvrability of policies is also problematic. Some policies promote the idea of venture capital without further implementation. According to the latest Worldwide Governance Survey conducted by World Bank in 2005, China ranked 103rd and 112th in the world in terms of the government effectiveness and regulatory quality, respectively.

The role of the government in the venture capital industry is as a policy maker, a major capital provider, a practitioner, and a regulator. Local governments were a dominant source of venture capital in the first ten years, and government backed venture capital institutions were managed by former governmental officials without much business experience. The mixed roles of the government in venture capital may reduce the incentives of the actors. Since the fund provider and the investment decision maker were the same, the budget constraints might be comparatively softer. Secondly, mixing the roles of regulator and practitioner might reduce the capability of law enforcement and the regulations in most cases. Managers who were mainly from government bureaus without specific business experience might not be capable in venture financing, which heavily relies on the expertise of venture capitalists. It might also induce more corruptions and black-box deals that deter good entrepreneurs from the domestic venture capital firms.

5.3.2 Normative Institutions in China

Informal institutions are also underdeveloped in China. First, independent market intermediaries and consultancies are not developed in China. In the United States, venture capital institutions rely on support from various intermediaries such as law firms and auditing firms for deal sourcing, due diligence, evaluation, and legal documentation preparation. However, intermediaries are much less developed, even though the government has made many efforts to keep professional standards in the

harmony line with international standards (Xiao et al., 2004). Moreover, the lack of accounting practices and underdeveloped accounting system indicates a company's accounts may not necessarily truly reflect its financial performance. Furthermore, the difference between Chinese Generally Accepted Accounting Principles and International Accounting Standards requires that the accountants fully understand both sets of principles. As such, conducting business due diligence and audits (under international standards) is essential before any corporate valuation is undertaken in China.

At the same time, China is impending talent shortage, in particular in high-end human resource markets. Venture capitalists' expertise is critical in all operational procedures of venture capital investment. In the US, most venture capitalists have rich management and investment banking experience and an MBA degree. However, these kinds of professionals are scarce in China due to the short history of the market economy and professional training. Professional financial advisors, managers and accountants that are important for venture capital investment are extremely rare (Farrel and Grant, 2005). Even though overseas returnees have increased in recent years, few professionals can achieve the standard.³¹ This shortage of talent influences not only the human resource of venture capital institutions but also entrepreneurial companies.

5.3.3 Cognitive Institutions in China

China's culture has long been considered one of the most influential institutions governing individuals' behaviours in the country and other countries in East Asia. Historically, the core cultural teachings of Confucianism have been normative for all Chinese groups. Confucianism places high value on social networks (*Guanxi*), social capital (*Face—Mianzi*), and trust among friends (Ford, 1997;

³¹ According to a survey conducted by McKinsey, the Global Institute (MGI), which was based on interviews with 83 human resources (HR) professionals involved with hiring local graduates in low-wage countries in 2005, it was found that fewer than 10 per cent of Chinese job candidates were suitable to work in a multinational company in finance and accountancy. Effective managers are in short supply. According to the MGI's estimate, given the global aspirations of many Chinese companies, over the next 10 to 15 years, they will need 75,000 leaders who can work effectively in global environments; today they have only 3,000 to 5,000. Management talent generally comes from several sources: offshoring enterprises that train lower-level workers, industries that produce managers with relevant skills, and expatriates who have worked or studied in countries with developed economies.

Graham and Lam, 2003). *Guanxi* and *Mianzi* are the two major aspects emphasized by researchers.

Chinese society has always relied on a well-functioning social network, or *Guanxi*. *Guanxi* describes a personal connection between two parties in which one is able to prevail upon another to perform a favour or service. Researchers have linked *Guanxi* with the concept of social capital; it has been exhaustively described in studies of Chinese economic and political behaviour. Social and cultural practices are deeply rooted forces that may take precedence over legitimate decisions based on laws or regulations. Business-to-government *Guanxi* may serve as a kind of a surrogate market system due to ill-defined property rights, economic roles, and restricted flow of information (Johnston, 1997). According to Park and Luo (2001), *Guanxi* provides a complement to contract law. However, *Guanxi* is a double-edged sword, which can in many cases also be interpreted as corruption. When a *Guanxi* network violates bureaucratic norms, it can lead to corruption and thus fortifies the weaknesses of the Chinese corporate governance system, in which the state still plays an important role (Braendle et al., 2005). Bruton and Ahlstrom (2003) suggest that *Guanxi* heavily impacts foreign venture capitalists' investment activities in China.

Another important cognitive institution in China is *Mianzi*, which represents the social perception of a person's prestige. For a person to maintain face is important in Chinese social relations, because face translates into power and influence, which affects goodwill. Therefore, in Chinese society, people try to avoid direct conflicts or bringing up embarrassing facts in public that may cause other people to lose *Mianzi* (Ho, 1976). Researchers have provided empirical evidence that *Mianzi* impacts people's business behaviour in China (Buckley et al., 2006; Bruton and Ahlstrom, 2003). Therefore, it is suggested that this cognitive aspect should be taken into account in studies on venture capital in China.

In summary, institutional environments related to China's entrepreneurship and venture capital investment are structurally different from those in the United States. Regulatory and normative institutions are underdeveloped, although have been improved substantially since 2004. In particular, lack of protection of property rights, weak rules on corporate governance, underdeveloped capital markets, lack of independent judicial system, and restrictions on foreign institutional financiers may

lead to problems in investment contracting and corporate governance structures, which are the crucial concerns in venture capitalists' screening and monitoring activities. Furthermore, the cognitive institutions in China are also unique and may impact business behaviour in venture capital investment. New institutional theorists suggest that, in certain cases, cognitive institutions can be superior to administrative or judicial dispute resolution among people with close social ties. That is, informal norms replace law. Given the weak regulatory and normative institutions and the unique cognitive institutions in China, it is questioned whether the institutions affect incentive schemes and, if so, to what extent.

5.4 Institutional Arrangements in China

According to the interviews and document analysis, VCFs in China are divided into two distinct groups in terms of the corporate governance structure, i.e. VCFs structured as limited liability companies and VCFs structured as limited partnership organizations. This divide is closely associated with the different regulatory requirements imposed to foreign venture capital firms and domestic ones.

Primarily, the two groups differ in organizational structure. Normally, venture capital firms are structured as limited partnerships in the US. However, as discussed, limited partnership, as an organizational form, was illegal in China until June 2007. Therefore, currently, all domestic venture capital firms are structured as limited companies (as seen in Table 5.1). They are mainly established as state-owned subsidiaries or spin-offs of related government agencies, large corporations, or prestigious universities. Although the first venture capital firm was established by the central government in 1985, those that followed were all controlled by local governments. Most leaders of domestic venture capital firms were former governmental officers or appointed by governmental bureaus before 1998. By the end of the 1990s, more venture capital firms were funded by large SOEs due to the relaxed regulations.

By contrast, incorporating overseas, most foreign venture capital firms are organized under limited partnership structure, except certain strategic venture capital firms that are subsidies of large foreign corporations or governments. As shown in Table 4.1, 19 out of 22 FVCFs interviewed are structured as limited partnerships in China whereas only three of the FVCFs are structured as limited companies. Among

these three limited companies, two are corporate venture capital firms and one is a government venture capital firm.

Table 5.2 Organizational Structures of the 34 Interviewed VCFs

Q1: WHAT IS THE ORGANIZATIONAL STRUCTURE OF YOUR INSTITUTION?			
	All VCFs (#)	FVCFs (#)	DVCFs (#)
Limited partnership	55.89% (19)	86.36% (19)	0
Limited liability	44.11% (15)	13.64 (3)	100% (12)
Total	100% (34)	64.71% (22)	35.29% (12)

According to the interviews, the VCFs of different organizational structures vary from each other in many aspects. The corporate governance and operation of the VCFs under limited partnership in China are similar to those of the VCFs under the same corporate structure in the US. However, the VCFs structured as limited companies are substantially different from either the limited partnership VCFs in China or their peers in the US.

Above all, the ownership structures and the compensation structures of the two types of VCFs are different. As shown in Table 5.2, in a limited partnership, VCs, as general partners, normally take unlimited liability for their minority share of the funds that is between one and three per cent of the total amount. At the same time, they charge 15 to 20 per cent of the total profits as carrier interests and 1.5 to 2.5 per cent of the total funds as annual management fees. Therefore, the major investment professionals in limited partnership VCFs may claim the residual revenues and, the compensation structure is a typical pay-for-performance one. The relationship between parties is more market-oriented that is similar to the US practice.

As in a VCF structured as a limited company, neither the executives nor the investment professionals hold the shares of the company. The compensations to investment professionals normally consist of fixed salary and bonus. Even though the bonus system is considered a pay-for-performance one, the interviews show that, for most LCVCFs, the bonus is moderate in size. As a VC from a foreign corporate venture capital firm said, *‘No, the bonus is not much even if the performance of our firm is great. It’s different from independent venture capital firms. We are a part of the huge enterprise, as you know. It is kind of a norm that the earnings of individuals of the same administrative level do not different much within the whole enterprise...’*

(Info: VCF27). Similar responses were gained from the domestic venture capitalists (DVCs).

Table 5.3 Compensation Structures of the 34 Interviewed VCFs

Q2: WHAT IS THE COMPENSATION STRUCTURE TO SENIOR INVESTMENT PROFESSIONALS IN YOUR FIRM?			
	All VCFs (#)	LPVCFs (#)	LCVCFs (#)
Fixed annual salary	100% (34)	100% (22)	100% (12)
Bonus by performance	73.53% (25)	68.18% (15)	83.33% (10)
Carrier interests	55.89 (19)	100% (19)	0 (0)
Others	20.59 (7)	28.57% (6)	9.10% (1)

Table 5.4 The Ownership and Compensation Scheme of the 19 LPVCFs

Q3: WHAT ARE THE OWNERSHIP AND COMPENSATION STRUCTURES IN YOU FIRM?			
	Max	Min	Mean
Ownership held by general partners	3%	1%	1.49%
Compensation composition			
Annual management fee	2.5%	1.5%	2.35%
Carrier interests	20%	15%	18.75%

The interviews also reveal that the performance measurements are more ambiguous and complicated in LCVCFs than those in LPVCFs. As a general manager of one DVCF illustrated, *'Well, measurements? That can be a lot. The [exertion of] efforts, capability, contributions, motives, attendance, etc. The assessments are made by the higher level supervisors'* (Info: VCF4). As shown in Table 5.4, the average number of major performance measurements is 3.89 for LPVCFs and 5.87 for LCVCFs respectively.

Table 5.5 The Number of Performance Measurements in the 34 VCFs

Q4: THE NUMBER OF MAJOR PERFORMANCE MEASUREMENTS IN VCFs			
	Min	Max	Mean
All VCFs	1	10	4.76
LPVCFs	1	6	3.89
LCVCFs	2	10	5.87

Associated with the difference in ownership and compensation structure, the governance structure and the decision-making process of the two different types of organizations also vary. According to the interviews, the limited partnership VCFs are governed under a multi-functional division structure that is more decentralized in decision-making. According to the limited partnership covenant, as limited partners, the fund investors are not allowed to involve in daily management of the venture capital firms. VCs, as general partners are relatively independent in decision-making. In a limited partnership, the partners are considerably independent from each other in deal sourcing, due diligence, contracting, and management of the portfolio companies. Only very important issues, such as investment and refinancing decisions, need approvals from the investment committee and the consensus of general partners of the fund. The interviews with VCs show that LPVCFs mainly work in a multi-divisional form that every partner usually has their own team composed few investment managers. The compensation and the reputation of partners and investment managers are closely related to the performance of the individual team. Team numbers are responsible for every aspect of their portfolio companies. As one FVC stated, *'No, we don't need to report much, everyone is busy anyway... of course, we [partners] share [information and opinions]. But, we work by independent teams, usually, each one has own team that composed with one or two investment managers...The team is responsible for every aspects of the projects, from evaluating to managing...'* (Info: VCF16). As shown in Table 5.5, in over 94 per cent LPVCFs, the original investment team is in charge of the management of the portfolio companies. The LPVCF is therefore a relatively flat organization in decision-making and governance.

By contrast, VCFs structured as limited companies are normally managed under a functional structure that is more centralized in decision-making. The interviews show that usually the investment decisions are made by executives based on the information reported by different levels of managers and through different functional divisions. In many cases, the decision-makers do not access to the entrepreneurs directly and do not involve in evaluation and due diligence of the investments. In addition, under such a unitary structure, the management of the portfolio companies is undertaken by a specific division rather than by the original

team that took due diligence. As shown in Table 5.5, in 80 per cent LCVCFs, the management of portfolio companies is conducted by specific portfolio management divisions rather than the original investment team. As a vice general manager in the second largest domestic venture capital firm in Beijing illustrated, *'We have different divisions, some mainly deal with deal sourcing and screening, some with due diligence, and some are in charge of legal or accounting issues...All of them report to their division managers, then the managers report to us...'* (Info: VCF4). The limited company is therefore more hierarchical in decision-making and governance.

Table 5.6 VCs' Management of the Portfolio Companies

Q5: WHO IS IN CHARGE OF MANAGEMENT OF PORTFOLIO COMPANIES?			
	All VCFs (#)	LPVCFs (#)	LCVCFs (#)
The original investment team	61.76% (21)	94.74% (18)	20% (3)
A specific management division	38.24% (13)	5.26 (1)	80% (12)

At the same time, the interviews show that these two types of venture capital firms differ in the degree of budget constraints they face. LPVCFs face much tighter budget constraints. According to the limited partnership covenants, the life span of the funds is limited, and the amount of the funds is normally fixed. However, VCFs structured as limited companies face softer budget constraints by working as subsidiaries of government agencies or large corporations. Usually, there is no hard limit on the length and the size of the funds for LCVCFs. Table 5.5 shows that 6 out of 34 venture capital firms were once refinanced by their investors; they are all LCVCFs.

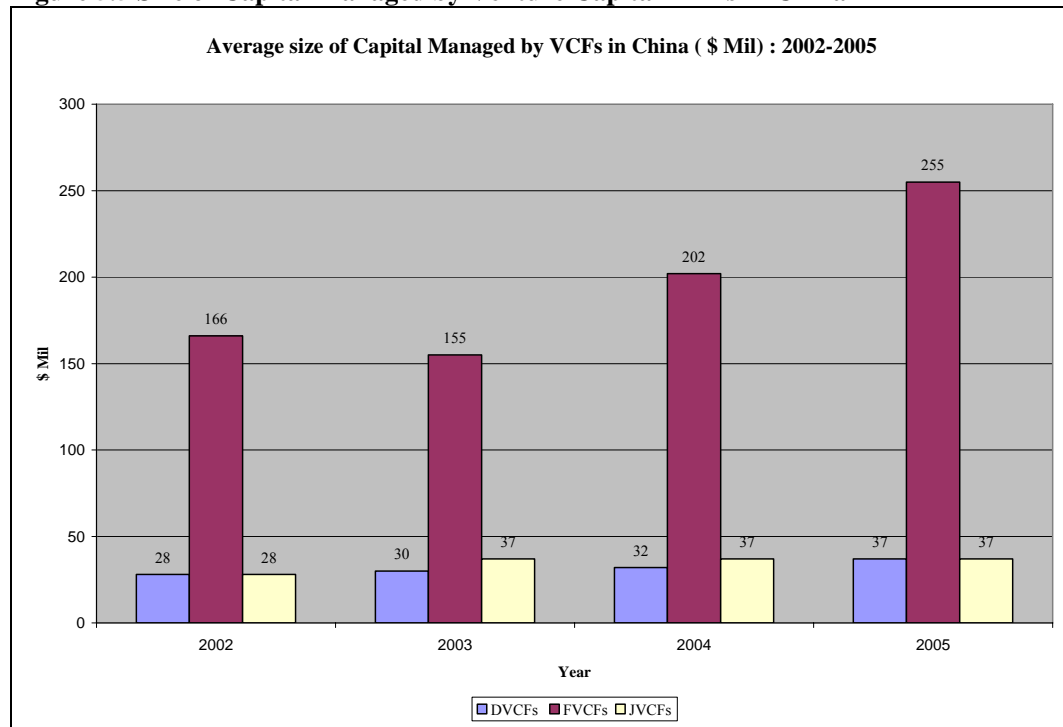
Table 5.7 The Budget Constraints of the 34 Interviewed VCFs

Q6: WAS YOUR FIRM REFINANCED BY THE SHAREHOLDERS WHEN YOU FACE FINANCIAL DIFFICULTIES?			
	All VCFs (#)	LPVCFs (#)	LCVCFs (#)
Yes	17.65% (6)	0 (0)	50% (6)
No	82.35% (28)	100% (22)	50% (6)

Furthermore, the two types of venture capital firms also vary in the size and sources of their funds. As discussed, according to Chinese law, pension funds, insurance corporations, and banks, which are the major sources of venture capital

funds in a developed economy, are not allowed in high risk venture capital institutions. Therefore, the major source of funds for domestic venture capital firms are local governments, large corporations, and universities that reasonably limit the fund size of domestic venture capital firms. In contrast, foreign venture capital firms raise funds from international markets. Funds of foreign venture capital firms in China are mainly raised from pension funds, insurance corporations, university endowments, and wealthy individuals, similar to the US practice. The funding sources for foreign venture capital firms are thus much richer than domestic venture capital firms. As shown in Figure 5.5, the average amount of capital under management by foreign venture capital firms is much larger than that of domestic venture capital firms.

Figure 5.5 Size of Capital Managed by Venture Capital Firms in China



Source: Annual Venture Capital Report in China (Zero2IPO)

Finally, the two groups of VCFs are also restricted by different laws due to the institutional legacy. As discussed in previous sections, foreign venture capital funds have explored some special vehicles to accommodate their investment in China in recent years to avoid foreign exchange control and other restrictions on operation and fundraising of foreign private equity funds. The most popular is to invest in

China through offshore holding companies, registering portfolio companies as offshore holding companies as well. Under the offshore registration system, the business activities of foreign venture capital firms and their portfolio companies are regulated by overseas laws. In this way, they avoid the restrictions of Chinese law such as weak protection of property rights, the prohibition of convertible security, weak law enforcement, and restrictions on IPO in China's venture capital markets. However, domestic venture capital firms are not allowed to employ the 'round trip' strategy. Therefore, some of the most widely used mechanisms in venture capital investment cannot be employed by domestic venture capital firms. Even though the restrictions have been gradually relaxed since 2004, problems remain, and it may take time to properly implement and enforce new rules. According to commonly accepted views, foreign venture capital firms operate business under stronger regulatory and normative institutions than domestic firms.

In summary, the interviews with venture capitalists show that, VCFs are divided into two different groups in terms of corporate governance structure due to the regulatory restrictions. These two types of VCFs differ from each other in many aspects including incentive schemes provided to investment professionals, the decision-making process, information flow, and budget constraints. LPVCFs are more decentralized and have harder budget constraints. Venture capitalists in LPVCFs take unlimited liability with higher-powered incentives. LCVCFs are more hierarchical with softer budget constraints. Moreover, venture capitalists in LCVCFs take limited liability with lower-powered incentives.

According to new institutional economics, under a more independent governance structure, market prices provide powerful incentives for exploiting profit opportunities, and market participants are quick to adapt to changing circumstances as information is revealed through prices. Compared with decentralized structures, however, hierarchies provide managers with weaker incentives to maximize profits and normally incur additional bureaucratic costs. Therefore, the major questions raised are whether and how the differences in institutional arrangements of the two types of venture capital firms may influence venture capitalists' investment strategies in China.

5.5 Summary

The foregoing sections introduced the history and institutions of China's venture capital investment based on the secondary document analysis and interviews. It shows that China's venture capital industry has experienced dramatic growth in the past ten years together with the economic, technological and institutional dynamics in this country. This market is currently becoming one of the most active venture capital markets in the world.

However, the institutions under which the venture capital investment operates in China are visibly different from those in advanced venture capital markets such as the US. Primarily, some institutional elements, which are widely believed as the most important factors affecting the development of venture capital markets and the mechanisms of venture capital investment, are extremely weak in China compared with those in developed economies. For example, the protection of private property rights and intellectual property rights is weak; the capital markets are underdeveloped; the rules on corporate governance and foreign institutional financiers are restrictive, and, the lack of professional financiers and managers etc.

At the same time, it is found that venture capital firms in China are divided into groups in terms of the organizational structures, fund sources, channels for divestment, and the legal system and regulations they must obey due to the institutional restrictions. In particular, with the offshore registration strategy, the majority foreign venture capital firms are structured as limited partnerships and raise funds from international markets like their counterparts in the US. However, all the domestic venture capital firms are structured as limited companies and can only raise funds in domestic markets. Interviews with VCs suggest that these VCFs under different organizational structure vary from each other in many aspects including the ownership structure, the compensation schemes, the decision-making process, the information flow and the budget constraints etc. The governance of VCFs under limited partnership is more similar to their peers in the United States, providing higher-powered incentives to investment professionals. By contrast, the VCFs structured as limited companies are visibly different from those in the United States in governance by providing lower-powered incentives to their investment professional.

As discussed in Chapter 3, the existing literature suggests that institutions, especially regulatory institutions, have significant impacts on financial activities and performance. It is also suggested that new institutional economics is powerful in explaining venture capital investment. The rapid development of China's venture capital industry under the weak regulatory institutions therefore seems to be puzzling. The question raised here is whether and how institutions affect venture capitalists' investment strategies and performance in China.

In particular, the institutional arrangement perspective of new institutional economics suggests that the governance structure has strong power to explain individual business behaviours and performance because firms under different governance structure provide distinctive incentives to business players to exert efforts and adapt to uncertainty. As discussed, venture capital investment is associated with more serious and complicated 'double-sided' agency problems and high degree of uncertainty. Moreover, it is well documented that venture capitalists' expertise and efforts are the key value of venture financing to control the higher risks encountered. It is therefore interesting to explore whether the differences in governance structure of VCFs in China affect VCs' investment activities; and, if the answer is yes, in what way the governance structure matters.

In the next three chapters, the venture capitalists' investment strategies including the investment preferences, ex-ante project screening and stage financing activities in China are investigated. By comparing these investment activities in China to those in the United States and other developed economies documented in the existing literature, this study pays special attention to the interaction between the unique institutions in China and the individual investment activities.

Chapter 6 Venture Capitalists' Investment Preferences in China

6.1 Introduction

This chapter explores venture capitalists' investment preferences in China and how institutions impact on the investment preferences. By exploring venture capitalists' investment focus in terms of the development stage and technological intensity of their portfolio companies, whether venture capital supports young R&D-oriented companies in China and the major factors that impact investment preferences of venture capitalist are examined.

Risk aversion is a fundamental investment principle. Concerns about risks are related to a high degree of uncertainty. Risk factors are often related to growth stage and technological intensity (Churchill and Lewis, 1983; Ruhnka and Young, 1987). Early-staged ventures face considerable management, market, and technological uncertainty. Empirical research also shows that venture capitalists believe the risk of investment loss is much higher for early stage investments (Elango et al., 1995; Ruhnka and Young, 1991). In addition, technological intensity determines uncertainty. More intensive technology imposes higher risks due to the more serious issues of informational asymmetry, positive externality, lack of liquidation value and the higher rate of failures (Riordan and Williamson, 1985; Scherer, 1998; Hall, 2002; Hart and Moore, 1994).

As discussed in previous chapters, the key value of venture capital investment is its striking ability to support newly established high-technology companies, thereby accelerating national innovation development. However, cross-country studies show that there are substantial variations in VCs' investment preferences. In some countries, VCs indeed invest more in younger and R&D oriented companies as they are expected whereas in some others, they do not (Jeng and Wells, 2001; Mayer et al, 2005). Even within the United States, the venture capital market is segmented by VCs' investment preferences in the development stages and industries of their portfolio companies (Bygrave and Timmons, 1992; Elango et al., 1995; Gupta and Sapienza, 1992).

China has made numerous efforts to promote venture capital programme in the past two decades with the expectation to support entrepreneurial R&D activities. The Chinese venture capital industry has experienced dramatic development. At the

same time, China is becoming one of the most favored investment destinations for VCs around the world. However, there is no systematic examination to assess to what extent VCs support young and R&D intensive projects in China.

This research therefore contributes to the existing literature by investigating VCs' investment preferences in China. It explores VCs' investment focuses in terms of the development stage and technological intensity of their portfolio companies as a general assess of the impact of venture capital investment on innovation and entrepreneurial activities in China. In addition, it also aims to find out the major factors affect investment preferences of VCs in China for a better understanding in the mechanisms of venture capital investment.

This study combines both qualitative and quantitative approaches. Based on unstructured interviews with seven venture capitalists and semi-structured interviews with 37 venture capitalists from 34 VCFs, the potential factors that might impact on VCs' investment preferences in China are explored at the initial stage. A systemic analysis on investment details of 628 venture financing deals made by 86 VCFs is then conducted to test the hypotheses raised from the interviews and the understandings in the existing literature.

It is found that, in general, venture capital indeed supports R&D oriented companies in China with a higher concentration in the information technology, communication, and semi-conductor industries. Most investments are made in the early or expansion staged projects; less than 15 per cent of the deals are backed the late stages. However, similar to the US practice, there are substantial variations in VCs' capability to finance young and R&D oriented companies in China. The organizational structure of the VCFs appears to be an important factor that determines VCs' investment preferences in the development stage and industry of the projects. The systematic analysis on the detailed investment information of 86VCFs demonstrates that VCFs structured as limited companies (LCVCFs) are more risk moderate than VCFs under limited partnership (LPVCFs) by investing more in older companies with lower technological intensity. The potential explanation for these results is the different incentive schemes and decision-making processes in the two different types of organizations. At the same time, similar to the US practice, VCFs from California and Massachusetts are more interested in early-staged projects; and,

VCFs that invest more in early-staged projects pay more attention to the proprietary of the products. However, Industry experience, local knowledge and fund size of the VCFs do not seem matter in China.

The major contribution of this study is to extend the existing literature on venture capital investment to understand the factors that may impact innovation financing and the relations between business behaviour and organizational structures; it also provides a basis for further cross-country comparative research in the venture capital industry. This study also has implications for policy makers concerned with adjusting legal frameworks and economic strategies and encouraging venture capitalists to meet different hi-technology development objectives. The study may also be of interest to entrepreneurs who look for venture capital and the initial fund investors who seek appropriate structure and management of their funds in increasingly competitive private equity markets.

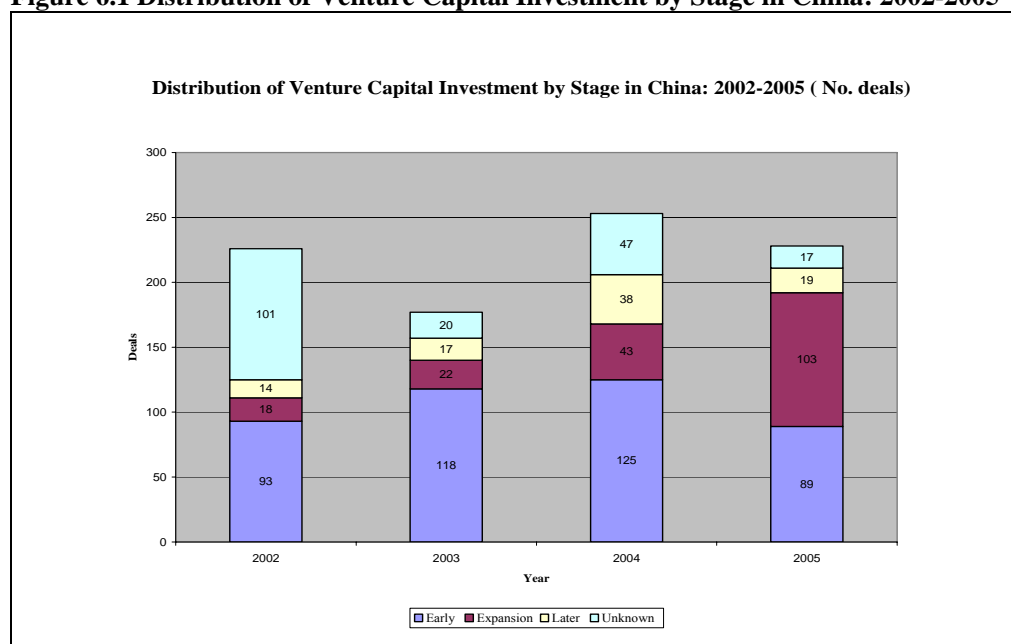
The rest of this chapter is organized as follows: Section two introduces the segmentation of China's venture capital market. Section three reviews the factors that impact venture capitalists' investment preferences, as discussed in the existing literature. Section four clarifies the research questions based on the findings of interviews and the existing literature. Section five introduces the data for quantitative analysis. Section six discusses the findings of the quantitative examination. Section seven presents the conclusion and implications.

6.2 Distribution of Venture Capital Investment in China

Since the mid-1980s, China's policy makers have made many efforts to adjust public policies in order to promote venture capital investment and to relax the financial constraints faced by young high-technology companies, thus improving national innovation. The industry has been developed rapidly in the past decade (see Chapter 5). Anecdotally, many successful newly-established high-technology companies (such as Sina, Sohu, Shangde, Shangda, and Infoasia) were backed by venture capital investment, which shows the great power of venture capital to support young R&D-oriented companies in China. According to statistics, China's venture capital industry shows distinct diversity in terms of capital flow in financing stages, industrial sectors, and regional allocations.

As seen in Figure 6.1, the venture capital market is segmented by financing stages. Venture capital investment in China focuses on early staged projects. According to the annual report conducted by Zero2IPO, over 48 per cent of the 884 deals backed by venture capital investment from 2002 to 2005 were in their early stage of development at the time of venture capital investment; 21 per cent in expansion stage; and 10 per cent in the late stage.³² The stage focus of VCFs was also dynamic during this time. Investment in expansion stage projects has continued to increase, while the number of investment deals in early stage projects began to drop in 2005 after three years of increase.

Figure 6.1 Distribution of Venture Capital Investment by Stage in China: 2002-2005



Source: Annual Venture Capital Report in China: 2003-2006 (Zero2IPO)

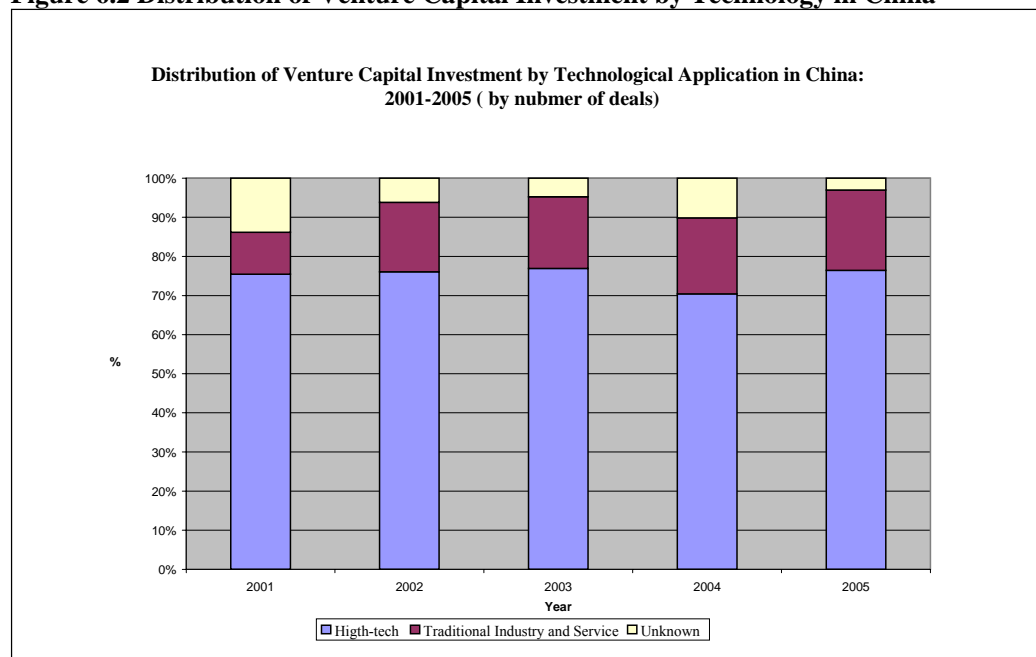
At the same time, as shown in Figure 6.2, venture capital investments are concentrated in high-technology industries. The percentage of venture capital backed deals in the high-technology industry has been sustained over 70 per cent from 2001 to 2005. The average percentage was about 75 per cent.

However, the investment focuses are dynamic. Table 6.1 shows that IT and communication have retained to be the most attractive sectors for venture capitalists from 2001 to 2005. Since the year 2003, venture capitalists' interest in

³² The development stages of the other 21 per cent are unknown.

healthcare/bio-tech declined slightly, while interest in semi-conductor projects has substantially increased. At the same time, other high-technology sectors like environment and new energy and new materials have attracted increasing interests from the venture capitalists during the years.

Figure 6.2 Distribution of Venture Capital Investment by Technology in China



Source: Annual Venture Capital Report in China: 2002-2006 (Zero2IPO)

Table 6.1 Distribution of Venture Capital Investment by Sector in China

	2001	2002	2003	2004	2005
Venture capital investment by sector in China					
Sector	No. deals	No. deals	No. deals	No. deals	No. deals
IT	46	62	39	53	78
Communication	28	30	30	38	40
Med/health-care/bio-tech	24	29	21	19	16
Semi-conductor	10	16	18	44	33
Environment	6	6	9	10	1
New material/energy	0	20	13	13	6
Other High-technology	6	9	0	4	1
Service	8	17	7	20	20
Traditional manufacturing	9	23	24	30	27
Unknown	22	14	8	26	7
Total	159	226	169	257	229
Venture capital investment by technology in China					
Technological Application	No. deals	No. deals	No. deals	No. deals	No. deals
High-tech Industry	120	172	130	181	175
Low-tech Industry and service	17	40	31	50	47

Unknown	22	14	8	26	7
Total	159	226	169	257	229

Source: Annual Venture Capital Report in China: 2002-2006 (Zero2IPO)

In general, the statistics show that venture capital investment is indeed concentrated on younger and technology intensive projects in China. At the same time, similar to the US practice, the market is also segmented in terms of VCs' focuses on the development stage and technological intensity of the projects. Who supports the younger R&D intensive companies? What are the major factors that determine VCs' investment focuses? The answers to the questions are not only important for understanding the mechanisms of venture capital investment but also for policymaking and business practice.

6.3 Qualitative Findings: Factors that Impact VCs' Investment Focuses

This section reports the interview findings and clarifies the research questions raised from the interviews and the understandings in the existing literature. The interviews with VCs and document analysis show that VCFs differ from each other in many aspects in China including the governance structure, the fund size, industry experience and background and the corporate strategy etc. According to the interviews and existing literature, some of the elements may have potential impacts on VCs' investment preferences.

6.3.1 Corporate Governance Structures of the VCFs

As discussed in Chapter 5, the interviews and secondary document analysis show that venture capital firms in China are divided into two major groups in terms of governance structure due to the regulatory restrictions. Limited partnership as an organizational form was illegal in China until 2007. Currently, all domestic venture capital firms are structured as limited companies. By contrast, most foreign venture capital firms are under limited partnership structure, except for certain strategic venture capital firms that are subsidiaries of large foreign corporations.

At the same time, the interviews show that the VCFs under different organizational structures vary from each other in many aspects. The VCFs under limited partnership are more decentralized in corporate governance than the VCFs structured as limited companies. It shows that the decision-making in VCFs under limited partnership is highly delegated and the information flow is very flat.

However, in VCFs structured as limited companies, the decisions are made by the top level executives based on the information passed from different divisions and through different level of hierarchies of the company. That is, in a VCF structured as limited company, the information flow is complex and hierarchical. In addition, the one who makes the decision is not personally involved in the key processes of venture capital investment such as project screening, due diligence, contract designing and post-investment monitoring etc. Furthermore, the interviews also find that the budget constraints faced by a VCF structured as a limited company is much harder than that faced by a VCF structured under limited partnership.

In summary, the interviews with venture capitalists show that, the two types of VCFs differ from each other in many aspects including incentive schemes provided to investment professionals, the decision-making process, information flow, and budget constraints. LPVCFs are more decentralized and face harder budget constraints. Venture capitalists in LPVCFs take unlimited liability with higher-powered incentives. LCVCFs are more hierarchical with softer budget constraints. Moreover, venture capitalists in LCVCFs take limited liability with lower-powered incentives.

According to the new institutional economics, differences in governance structure and the incentives schemes may lead to different business behaviours. It is suggested that hierarchical organizations provide business actors with weaker incentives to maximize profits and normally incur additional bureaucratic costs (Williamson, 1991). Lacking internal incentives and commitment to harden budget constraints, hierarchical organizations normally conduct financing activities on an ad hoc basis. Such a governance structure may discourage the investment professionals to take risks. In contrary, under a more independent corporate governance structure with higher-powered incentive arrangements, decentralized organizations may encourage players to take a higher risk-return profile (Salhman, 1990; Huang and Xu, 1998).

Empirical evidence shows that risk factors are often related to the growth and technological intensity (Elango et al., 1995; Ruhnka and Young, 1987, 1991). Ruhnka and Young (1987) present five sequential stages in the development process based on the views of venture capitalists. They find a strong census on key

development goals in various stages as well as developmental risks associated with each stage. The findings from interviews with VCs in China are consistent with the findings of Ruhnka and Young (1987). At the same time, more intensive technology imposes higher risks due to the more serious issues of informational asymmetry, positive externality, lack of liquidation value and the higher rate of failures (Riordan and Williamson, 1985; Scherer, 1998; Hart and Moore, 1994). Therefore, if the arguments concerning the relationship between the corporate governance and risk-taking capability indeed reflect the reality in China's venture capital investment, the followings hypotheses are suggested:

Hypothesis 1a: LPVCFs invest more in R&D intensive projects than LCVCFs.

Hypothesis 1b: LPVCFs invest more in younger projects than LCVCFs.

Hypothesis 1c: LPVCFs invest more in early-staged projects than LCVCFs.

6.3.2 Capital Size of the VCFs

The interviews with VCs also suggest that VCFs are divided into groups by the size of funds they manage. As discussed in the foregoing text, foreign VCFs raise funds from international markets. The fund sources of FVCFs are much richer than that of DVCFs which are mainly backed by the government agents, large corporations, and universities.

According to the interviews, the average capital size managed by the 34 VCFs is \$1406.46 million with high standard deviations. Overall, 17 of 27 VCFs manage over \$100 million. The amount of capital managed by DVCFs is substantially less than that managed by FVCFs. As shown in Table 4.6, the two VCFs that manage less than \$25 million are domestic; only 4 out of 17 VCFs that manage over \$100 million are domestic. The differences are not as sharp as in the size of funds under management when looking at the size of capital that can be invested in China. However, it shows nearly the same pattern. The average amount of capital can be invested in China for the VCFs is \$486.9 million with a standard deviation at 344.76. 11 out of the 13 VCFs that manage over \$100 million capital that can be invested in China are foreign.

Table 6.2 The Size of Capital Managed by the 34 VCFs

CAPITAL SIZE OF THE VCF							
Panel 1: Capital under management of the VCFs (the ones known capital)							
	Number of VCFs			Size of funds (\$ Million)			
	All	FVCFs	DVCFs	Mean	Max	Min	Std. Div
< 25	2	0	2	14.5	16	13	2.12
> = 25 & < 100	8	6	2	62.25	75	37.75	11.42
> = 100	17	13	4	2298.08	29700	100	7076.01
Total	27	19	8	1406.46	29700	13	5659.84
Panel 2: Capital can be invested in China (the ones known capital)							
	Number of VCFs			Size of funds (\$ Million)			
	All	FVCFs	DVCFs	Mean	Max	Min	Std. Div
< 25	2	0	2	14.5	16	13	2.12
> = 25 & < 100	8	6	2	57.23	75	30	15.54
> = 100	13	11	2	486.9	1086.70	178.00	344.76
Total	23	17	6	280.66	1086.70	13	328.34

Research suggests that capital size impacts VCs' investment preferences. Some researchers examine venture capitalists' investment preferences by employing Markowitz's portfolio methodology. The literature emphasizes risk diversification and attributes the different investment preferences of VCs to resource constraints and cost considerations (Elango et al., 1995; Lerner, 1995; Gupta and Sapienza, 1992). For example, based on a questionnaire of 149 venture capitalists in the US, Elango et al. (1995) find that venture capital firms are divided into different groups based on investment preferences and ex-post involvement in portfolio companies due to resource constraints. According to the survey, the earlier the investment stage, the greater the interest of venture capitalists is built upon proprietary products, product uniqueness, and high growth markets. Late-stage investors are more interested in demonstrated market acceptance. Elango et al. (1995) also find that larger venture capital firms invest more in late-stage projects, whereas smaller venture capital firms focus on earlier stages. Moreover, larger venture capital firms have more professionals and manage more money per professional. Since venture capitalists must exert effort to monitor and provide value-added supports to their portfolio

companies, venture capitalists who manage more capital must limit the number of deals by increasing the size of investment per deal in order to control costs. However, early-staged companies normally have less value. Therefore, larger venture capital firms invest more in late-staged companies. If the fund size indeed matters on VCs' investment choice in China, the following hypotheses are raised:

Hypothesis 2a: Larger VCFs invest more in early-staged projects than smaller VCFs.

Hypothesis 2b: Larger VCFs invest less in younger projects than smaller VCFs.

6.3.3 Experience and Background of the VCFs

The VCFs in China also show great deviations in terms of the history, local knowledge, experience in managing certain types of funds, and industrial background. First, the venture capital firms substantially differ in industry experience. The average age of the 34 interviewed VCFs is 9.68 by the end of 2006. The standard deviation is 6.01. About 45 per cent are between six and ten years old; 32 per cent are less than six years old; and 30 per cent are more than ten years old. Moreover, due to the short history of venture capital industry in China, DVCFs have less industry experience than FVCFs. As shown in Table 4.7, the average age is 11.5 for FVCFs and 6.33 for DVCFs. All DVCFs are less than ten years old, while 45 per cent of the FVCFs have been operating in this industry for more than ten years.

Moreover, the VCFs differ in local operating experience in China. The length of time that the VCFs undertake venture capital investment in China ranges from two years to fourteen years. The average operating time in China for FVCFs is almost the same as that for DVCFs. At the same time, 3 out of the 22 FVCFs have operated in China for more than ten years.

Table 6.3 The Industry and Local Experience of the 34 VCFs

INDUSTRY EXPERIENCE AND LOCAL KNOWLEDGE (YEAR)						
Panel 1: The age of the VCFs by the end of 2006 (known the time of establishment)						
	Number of VCFs			Average age of the VCFs		
	All (#)	FVCFs	DVCFs	All	FVCFs	DVCFs
= < 5	32.14% (9)	18.18% (4)	41.67% (5)	4.11	4.2	4
> 5 & =< 10	44.12% (15)	36.36% (8)	58.33% (7)	7.14	6.67	7.5
> 10	29.41% (10)	45.00% (10)	0 (0)	17.46	17.46	0
Total	100% (34)	64.71% (22)	35.29% (12)	9.68	11.55	6.63
Panel 2: The experience of operation in China by the end of 2006						
	Number of VCFs			Average age of the VCFs		
	All (#)	FVCFs	DVCFs	All	FVCFs	DVCFs
= < 5	35.29% (12)	36.36% (8)	33.33% (4)	3.83	3.75	4
> 5 & =< 10	55.88% (19)	55.88% (11)	66.67% (8)	7.26	7.09	7.5
> 10	8.82% (3)	8.82% (3)	0 (0)	13	13	0
Total	100% (34)	64.71% (22)	35.29% (12)	6.56	6.68	6.33

The effects of the industry experience and local knowledge on business behaviours and performance have long been debated. Some researchers suggest that experienced decision-makers make better decisions and perform better (Choo and Trotman, 1991; Nosofsky, 1987). However, Shepherd et al. (2003) find no relationships between VCs' industry experiences and their performances. At the same time, some scholars argue that the knowledge on local markets may help business players to reduce investment risks, improve the efficiency and increase to ability to exploit resources (Johanson and Vahlne, 1977; Luo and Peng, 1999). As discussed, venture capital is an innovative financial instrument that heavily relies on the expertise of venture capitalists. If industry experience and local knowledge indeed impact on business activities and performances, it is expected that older VCFs

and those with more local operating experience may take higher risk-return profiles by investing more in projects with more uncertainties to exploit more potential profits. Thus, the following hypotheses are raised:

Hypothesis 3a: VCFs with more venture financing experience invest more in projects with higher R&D intensity than those with less experience.

Hypothesis 3b: VCFs with more venture financing experience invest more in younger projects than those with less experience.

Hypothesis 3c: VCFs with more venture financing experience invest more in early-staged projects than those with less experience.

Hypothesis 3d: VCFs with more local investment experience invest more in projects with higher R&D intensity than those with less experience.

Hypothesis 3e: VCFs with more local investment experience invest more in younger projects than those with less experience.

Hypothesis 3f: VCFs with more local investment experience invest more in early-staged projects than those with less experience.

Another observation from the interviews is that most of the FVCFs are from the United States. As seen in Table 6.4, 16 out of the 22 FVCFs are from the United States. More interestingly, 12 out of the 16 VCFs from the US are from California or Massachusetts where venture capital investment was originated. Empirical studies also find that VCFs from California and Massachusetts invest more in early-staged projects than those in New York (Elango, et al., 1995; Saxenian, 1989). It is suggested that, history, culture and economic environments may have impacts on VCs' investment activities. It is therefore questioned whether the origin of the VCFs may have effects on VCs' investment preferences when they operate across borders. If it does, the hypotheses are raised as follows:

Hypothesis 4a: VCFs from California or Massachusetts invest more in projects with higher R&D intensity than other VCFs.

Hypothesis 4b: VCFs from California or Massachusetts invest more in younger projects than other VCFs.

Hypothesis 4c: VCFs from California or Massachusetts invest more in early-staged projects than other VCFs.

Table 6.4 Origin of the FVCFs

ORIGIN OF THE FVCFs		
	Number of the VCFs	% of the total FVCFs
US	16	73.73
California & Massachusetts	12	54.55
Other Nations	6	27.27

6.3.4 Product Proprietary and Investment Stage

My interviews with VCs also demonstrate that they have different views on product protection. Some VCs emphasize the proprietary of the products. As one DVC said, *‘The product must be innovative in technology. Almost all our companies [portfolio companies] have more than one patent. Our mission is to support innovative projects anyway...’* (Info: VCF4). The statement is also echoed by one FVC: *‘Unique advantages in products or service is a necessary condition. New firms can hardly survive without innovation. No matter it is an innovative business model, technology or marketing strategy, it must be innovative and the innovation is must be something cannot be easily duplicated...’* (Info: VCF24). These statements are consistent with what Elango et al. (1995) find in the United States. The authors find that VCFs that invest more in early-staged projects pay more attention to the proprietary of the products. However, some VCs suggest that the protection of products is not really important in China, pointing out that as long as intellectual property right laws are not enforced, innovation cannot be protected. The diverse statements therefore suggest an examination on whether the product proprietary is indeed important for early stage investment in China. The following hypotheses are hence raised:

Hypothesis 5: VCFs that invest more in early-staged projects pay more attention to the proprietary of products.

6.4 Data for Quantitative Analysis

6.4.1 Data Collection and Sampling

Firm level data on demographic and investment information of VCFs as well as their portfolio companies are drawn from the ‘Venture Economics’ Database³³ and a hand-collected database built on the interviews and secondary document analysis.³⁴ The two datasets provide detailed information on over 160 VCFs and over 1020 venture capital backed deals in China from 1990 to 2006. The sample represents about half of the total VCFs and two fifths of the total venture capital backed deals in China.

A two-stage strategic sampling method is employed in this study. First, the VCFs that are involved in less than three deals in China are excluded. After the screening, 102 VCFs that have invested in over 880 deals are left in the dataset. Then, a random sample of 86 VCFs was selected from the screened sample pool for final analysis. The VCFs have invested in 628 deals in China, representing over one fourth of the total venture capital deals in the country.

Individual information on R&D intensity and the ratio of intangible assets are not available, since all venture capital backed companies are privately held companies at the time of venture financing. Therefore, industry average data on R&D intensity and intangibility of assets of the venture capital backed companies from China’s High-Tech Industry Statistics³⁵ and ‘Financial Data on China’s Industrial Enterprises’³⁶ (1998-2005) are employed in this study. The data are matched by date and industry to each company and each round of financing, as in Gompers’ (1995) study on the US venture capital market.

33 This database has been extensively used in previous venture capital research (e.g. Bygrave, 1989; Lerner, 1994; Gompers, 1995; Gompers and Lerner, 1999a; Kortum and Lerner, 2000). Venture Economics has gathered venture capital investment data since the 1970s using annual reports of venture capital funds, personal contacts to funds’ personnel, initial public offering prospectuses, and deals announced in the media. The database contains information on over 200,000 private equity investments (one whole financing round consists of several single investments) and is widely recognized as a leading source of venture capital investment data. Currently, it has gathered investment information on over 530 venture capital deals in China.

34 The hand-collected data were mainly from interviews and websites of the venture capital institutions and their portfolio companies.

35 The data were on a more aggregate level that only IT, Semi-conductor, electronic, medical care and biotech could be collected. This might influence the results, although most of our samples are in these industries.

36 This dataset covers financial data on all registered industrial enterprises whose annual sales are over 5 million RMB in China from 1998 to 2005.

6.4.2 Variables in Quantitative Analysis

6.4.2.1 Dependent Variables: VCs' investment focus in stage and technology

1. **VCs' investment focus regarding technological intensity:** Venture capitalists' investment focus regarding technology is measured by the average R&D intensity of the portfolio companies backed by the individual VCF. The industry average ratio of R&D spending to value added and the ratio of R&D spending on new products development to value added are used as measurements of R&D intensity.

2. **VCs' investment focuses regarding development stage:** Venture capitalists' investment focus regarding the development stage is measured by the ratio of distribution of individual VCFs' portfolio companies in early stage projects, expansion stage projects, and late stage projects. The development stage is self-reported by the VCF at the time of venture financing.³⁷ Normally, the development stage is categorized into early (seed/start-up, first stage), expansion (expansion stage, second stage) and late stages (third stage, bridge, Buyout/acquisition, other late stages). There are no clear divisions between the definitions of each stage; thus, divisions should be seen as relative measures rather than absolute measures (Gompers, 1995).

3. **VCs' investment focus regarding the maturity of the companies:** Venture capitalists' investment focus regarding the maturity of the companies is measured by the percentage of the deals backed by the VCF that were less than two years old at the time of financing. A company that has a longer history is able to provide more information to investors, so venture capitalists can better judge their prospects. According to the interviews, venture capitalists suggest that companies less than two years usually have more uncertainties. Therefore, companies less than two years are considered younger companies in this study. This variable is also taken as complementary to the development stage variable, since information in the development stage is not as accurate.

6.4.2.2 Independent Variables

1. **Governance structure of the VCF:** Since accurate information on governance structure of the VCFs is not available, the governance structure is proxied by the

³⁷ There are no clear divisions between the definitions of each stage, so divisions should be seen as relative measures rather than absolute measures (Gompers, 1995).

origin of the venture capital firm. As the majority of FVCFs are structured as limited partnerships and all DVCFs are organized as limited companies due to regulatory restrictions, VCFs are divided into two groups. FVCFs are proxied as VCFs under limited partnership, whereas DVCFs are proxied as VCFs under the limited company structure.

2. Size of the funds: Fund size is measured as the amount of total funds managed by the VCF by the end of 2006.

3. Experience of the VCF in venture financing: The experience of the VCF in venture financing is measured as the age of the VCF at the end of 2006.

4. Experience of the VCFs in venture financing in China: The experience of the VCFs in venture financing in China is measured as the age of the VCF at the end of 2006 for domestic venture capital firms. For foreign venture capital firms, experience is measured by the length of time from the year when the VCF entered the China's market until the end of 2006.

5. VCFs from California or Massachusetts: Whether the VCF is from California or Massachusetts is chosen as a dummy variable. The variable equals one if it is from California or Massachusetts; otherwise, it is zero.

6. Emphasis on product protection of the VCF: The VCF's emphasis on product protection of their portfolio companies is measured as the average ratio of intangibility of the companies that it backed by the end of 2006. The industry average ratio of intangible assets to total assets is taken as a proxy of product protection of the venture capital backed company.

6.4.2.3 Controlling Variable

A dummy variable stating whether the VCF has a pre-set industry preference in the high-technology industry is taken as a controlling variable in the analysis. According to the interviews and archives analysis, some VCFs have pre-set investment strategy in terms of industry preference. For example, 13 of 34 VCFs target the information industry or other high-technology industries; 2 of 34 VCFs target non-high-technology industries. The rest of the VCFs do not have precise pre-set investment strategy in terms of industry. Normally, the pre-set investment strategy depends on the degree of risk aversion of the ultimate investors of the venture capital funds on the one hand; on the other hand, it depends and the expertise

of the venture capitalists who will manage the funds. Since this study aims to determine the major factors that impact investment preferences, the pre-set strategy of the VCFs must be controlled. The pre-set industry strategy of VCFs is normally public information that can be searched from their annual reports or websites. The variable equals one when the VCF has pre-set high-technology industry preference and zero if the VCFs does not have pre-set high-technology industry preference.

6.4.3 Descriptive Statistics of the Sampled Data

6.4.3.1 General information

Overall, 86 VCFs that closed more than four deals in China by the end of 2006 were selected for this study. Table 6.5 shows that 23 of 86 VCFs are domestic; the other 63 are FVCFs. According to the data, the VCFs invested in 628 deals in China by the end of 2006, among which 76.91 per cent were backed by FVCFs and only 23.09 per cent were supported by DVCFs. Over 85 per cent of the deals closed after 1998. Furthermore, the average size of the funds managed by the VCFs substantially differs. The average amount of funds managed by the FVCFs is over twenty times larger than those managed by the DVCFs. The operating history in venture financing industry of the FVCFs is also much longer. The average age of the FVCFs is over 19 years old and over 7 years old for the DVCFs. However, the experience of the FVCFs operating in China is less than that of the DVCFs. Moreover, about half of the FVCFs are from California or Massachusetts.

Regarding pre-set investment strategies, the data show that over 62 per cent of the VCFs have pre-set investment targets at high-technology companies. Most VCFs aim to invest in high-technology companies in China. At the same time, the average ratio of funds targeting at early-staged projects managed by the VCFs in the sample is 22 per cent. There is no visible difference between the FVCFs and the DVCFs in terms of their pre-set investment strategies in the industry and development stage of the portfolio companies.

The basic patterns shown from the sample are consistent with the interview findings and the archive analysis. Primarily, FVCFs are more active than DVCFs in China's venture financing market, which is consistent with the secondary document analysis and the survey conducted by Zero2IPO (see Chapter 2). At the same time, FVCFs control much more capital than DVCFs. Furthermore, FVCFs have more

experience than DVCFs in venture financing industry but less experience in China's market. According to the self-reported information, most VCFs target high-technology companies and their investment preferences in early-staged projects are not as strong.

Table 6.5 Demographic Information of the 86 Sampled VCFs

	ALL VCFS	FVCFS	DVCFS
Number of VCFs	86 (100%)	63 (73.26%)	23 (26.74%)
The average size of funds under management of the VCFs (\$million)	2467.18	3088.21	138.31
The average age of the VCFs (year)	16.34	19.70	7.13
The investing experience in China (year)	5.65	5.16	7.13
The number of deals closed in China	628 (100%)	483 (76.91%)	145 (23.09%)
The number of VCFs from California or Massachusetts	27 (31.40%)	27 (42.86%)	
The pre-set preference in high-technology industry	54 (62.79%)	38 (60.03%)	16 (69.57%)
The average ratio of funds targeting at early-staged projects VCF (calculated by the number of funds)	22.05%	23.14%	19.17%

6.4.3.2 Investment distribution of VCFs

Similar to the US practice, there is a clear market segmentation of the investment focus of venture capitalists on stages and technological sectors in China. As shown in Table 6.6, among the 628 deals backed by the 86 VCFs in the sample, 30.74 per cent of projects were invested at the early stages; 56.84 per cent at expansion stage; and 12.42 per cent of the total in later stage. The percentage of investments focusing on the expansion stage is much larger and the percentage of the investment in early-staged projects is much smaller in the sample compared with that of the survey data of Zero2IPO. Without access to detailed descriptions of the methodology employed by Zero2IPO, this study relies on first-hand collected data from the interviews and the Venture Economics dataset, which has been extensively used by researchers. However, both the hand-collected data and data from Zero2IPO show that the venture financing market is segmented by stage focuses of the venture capitalists in China. Moreover, the hand-collected data show that 25.48 per cent of the deals were less than two years old at the time of investment.

Furthermore, FVCFs invested more in projects at the expansion stage and in younger projects. This is consistent with the expectation that LPVCFs (those are proxied by FVCFs in this study) are more profit-oriented and thus more sensitive to the tradeoffs between risks and returns. Another interesting observation is that the age of the venture capital backed companies is not fully correlated with the self-reported development stage, especially with the deals backed by DVCFs. As seen in Table 6.6, only 13.99 per cent of the DVC-backed deals were less than two years of old at the time of venture financing, whereas 33.79 per cent of the total were early-staged projects. According to the data, over half of the early-staged projects backed by DVCFs were more than two years old.

Table 6.6 Distribution of Venture Capital Backed Deals by Development Stage

	All VC-backed deals		Deals backed by FVCFs		Deals backed by DVCFs	
Panel A Distribution of VC-backed deals by development stage at the time of venture financing						
	No. deals	%	No. deals	%	No. deals	%
Seed	30	4.78%	16	2.90%	14	11.27%
Start-up	39	6.21%	13	2.28%	26	19.72%
Other Early stage	124	19.75%	120	24.74%	4	2.80%
Expansion	357	56.84%	283	57.97%	74	52.11%
Later stage	78	12.42%	53	11.99%	25	17.50%
Total	628	100%	485	77.23%	143	22.77%
Panel B Distribution of the age of VC-backed deals at the time of venture financing						
	No. deals	%	No. deals	%	No. deals	%
> 2 years old	468	74.52%	345	71.13%	123	86.01%
<= 2 years old	160	25.48%	140	28.87%	20	13.99%
Total	628	100%	485	77.23%	143	23.77%

Concerning the distribution of the venture capital backed deals by industry, it also shows visible diversity, although there is a significant concentration in the information technology and electronic sectors. As shown in Table 6.7, 75.8 per cent of the total projects are in high-technology industries; only 24.20 per cent are from traditional industries. Even though there is no obvious difference in the ratio of the investment in high-technology industries between the two types of VCFs, the focus of the investment is visibly different. For instance, FVCFs invested more in the Internet specific and Semi-conductor industries, while the domestic firms invested more in computer software and healthcare industries. According to the data, the industry average ratio of R&D spending to total value added across high-technology industries substantially differs. On average, it was 5.83 per cent in the

communication and IC industries from 2001 to 2005 and only 2.6 per cent for the healthcare industry. R&D intensive companies are associated with more server information problems and encountered a higher rate of failure. This indicates that the two types of VCFs may take different risks by investing in companies with different degrees of R&D intensity.

Table 6.7 Distribution of Venture Capital Backed Deals by Industry & Technology

	All VC-backed deals		Deals backed by FVCFs		Deals backed by DVCFs	
Panel A Distribution of VC-backed deals by industry						
	No. deals	%	No. deals	%	No. deals	%
Internet Specific	154	24.52%	151	31.13%	23	16.08%
Computer Software	68	10.82%	43	8.87%	25	17.48%
Computer Hardware	19	3.02%	15	3.09%	4	2.80%
Computer others	7	1.11%	2	0.41%	5	3.50%
Communication	73	11.62%	66	13.61%	21	14.69%
IC	93	14.81%	82	16.91%	11	7.69%
Med/Healthcare	23	3.66%	12	2.47%	11	7.69%
Biotech	5	0.80%	1	0.21%	4	2.80%
Business service	30	4.78%	23	4.74%	7	4.90%
Industry/Energy	23	3.66%	12	2.47%	11	7.69%
Financial service	22	3.50%	21	4.33%	1	0.70%
Consumer related	68	10.83%	24	4.95%	10	6.99%
Arg/Fishery/Forestry	9	1.43%	6	1.24%	3	2.10%
Others	9	1.43%	8	1.65%	1	0.70%
Transportation	8	1.27%	8	1.65%	0	0
Construction	5	0.80%	4	0.82%	1	0.70%
Manufacturing	10	1.60%	5	1.03%	5	3.50%
Others	11	1.75%	10	1.09%	1	0.70%
Panel B Distribution of VC-backed deals by technological application						
High-tech Industry	476	75.80%	372	76.70	104	72.73%
Traditional Industry	152	24.20%	123	23.30%	39	27.27%
Total	628	100%	485	77.23%	143	23.77%

6.5 Findings from Quantitative Analysis

6.5.1 VCs' Investment Preferences: Development Stage and Maturity

Table 6.8 represents the estimates of the relations between the venture capitalists' preferences in the development stage and the characteristics of the VCF. The dependent variable in Panel A is the average ratio of the early-staged deals supported by the VCF. The dependent variable in Panel B is the average ratio of the number of deals invested in younger projects by the VCF. The independent variables include the capital size managed by the VCF, the experience of the VCF in the venture capital industry, the operating experience of the VCF in China, the ratio of

early stage funds managed by the VCF, the average asset intangibility of the companies backed by the VCF, a dummy variable that equals one if the VCF is governed under limited partnership, and a dummy variable that equals one if the VCF is from California or Massachusetts.

Overall, the regression analysis shows that the proprietary of products, the corporate governance structure of the VCF, and whether the VCF is from California and Massachusetts are correlated to venture capitalists' investment preferences in terms of development stage and maturity of the portfolio companies. However, the capital size and the VCF's experience in venture financing industry and venture financing in China do not matter.

As shown in Table 6.8, Hypothesis 1b is supported. The dummy variable LPVCF is significantly and positively correlated to the ratio of venture investment in younger projects made by the VCF. This indicates that venture capital firms under limited partnerships invest more in younger companies than venture capital firms structured as limited companies. It is well-documented that younger companies are associated with more uncertainties and risks. This study thus provides evidence that VCFs under a more independent governance structure take more risks than VCFs under a more hierarchical governance structure.

The result is consistent with several arguments in new institutional economics. First, it supports transaction cost theory, which argues that decentralized or market-oriented organizations provide stronger incentives for actors to exploit profit opportunities and that actors are quick to adapt to changing circumstances as information is revealed through prices. Therefore, decentralized organizations take higher risks in investment (Williamson, 1979; 1991). Second, it also provides evidence for the soft budget constraints theory that argues the lack of commitment to terminate bad investment projects due to the softer budget constraints of the hierarchic investment institutions interferes with venture capitalists' ex-post screening capability. This issue may also reduce the risk-taking ability of hierarchical investors (Dewatripont and Maskin, 1995; Huang and Xu, 1998).

Although a significant relationship between the corporate governance structure of the VCF and early-stage investments was expected, the analysis does not show any correlation; therefore, Hypothesis 1c is rejected. The correlation analysis

for the development stage and the age of the venture capital backed deals shows that the two variables are not significantly correlated. This confirms my previous concerns on the information of development stage. One explanation for this result might be different life cycles for companies across industries. For example, in the Internet specific industry, companies may grow and expand substantially faster than those in Semi-conductor or biotech industries. This also leads to the deviation between the development stage variable and the maturity variable of the venture capital backed company.

As predicted in Hypothesis 5, the emphasis on the proprietary of products is significantly and positively correlated to the ratio of investment in early-staged projects and the ratio of investment in younger companies undertaken by the VCF. Table 6.8 shows that the average asset intangibility of the portfolio companies backed by the VCF has the strongest power in both regression examinations. VCFs that invest more in early-staged projects and younger companies pay more attention to the uniqueness and the protection of products or services in China. The result is consistent with the existing literature based on US observations. Additionally, the result partially confirms the qualitative findings from the fieldwork. The interviews suggest that, similar to their US peers, venture capitalists in China take the innovative capability as the major power that supports younger companies to achieve competitiveness in the market.

The regression examination shows that the VCFs from California or Massachusetts significantly differ from others in their investment choices in terms of development stage and maturity of the portfolio companies. As seen in Table 6.8, the dummy variable that states whether the VCF is from California or Massachusetts is significantly and positively correlated to the ratio of investment in early-staged projects and the ratio of the investment in younger companies. This implies that the VCFs from California or Massachusetts are more interested in newly-established companies in China. Hypothesis 4b is therefore confirmed. The result is consistent with the findings of Elango et al. (1995), who compare venture capitalists' investment preferences in different regions within the United States. The result of this study further confirms that venture capitalists from different regions keep their business culture and strategies even they go overseas (Saxenian, 1989).

However, according to the regression analyses, capital size does not play a role in investment preferences in terms of development stage and maturity. Hypotheses 2a and 2b are thus rejected. This indicates that resource constraints and cost considerations are not the major factors that determine investment preferences in China. The results differ from the existing literature. Moreover, no experience variables matter in determining venture capitalists' investment preferences, suggesting that neither experience in the venture financing industry nor experience in local operation of the VCF influence venture capitalists' investment preferences in China. Hypotheses 3b, 3c, 3e, and 5f are therefore rejected.

Table 6.8 Regressions for VCs' Investment Preferences in Development Stage and Maturity

The sample is 86 randomly selected VCFs in China that have been invested in more than 3 deals in China till the end of 2006. The 86 VCFs have invested in 628 deals in China in total. Estimates are from OLS regressions for both Panel A and Panel B (t-statistics for the regression coefficients are in parentheses.). The dependent variable for Panel A is the ratio of early-staged deals to total deals backed by the VCF. The dependent variable for Panel B is the ratio of deals invested in young companies to total investments made by VCF. Independent variables include a dummy variable that equals to 1 if the VCF is governed under limited partnership and a dummy variable that equals to 1 if the VCF is from California or Massachusetts. The emphasis on proprietary of the products is measured by the average asset intangibility of the deals backed by the VCF. . Intangibility of assets is measured by the average ratio of intangible assets to total assets for the firms in the company's industry. Capital size is measured by the total amount of capital managed by the VCF in million in constant 2000 US Dollar. Age of the VCF refers the age of the VCF till the end of 2006 that is calculated in year. Experience of the VCF in China is measured by the length of time from the time the VCF started business in China to the end of 2006 that is calculated in year. Asterisks indicate statistical significance at the 5% ** and 10% * levels.

Panel A Regression on VCs' Investment Preferences in Development Stage

DEPENDENT VARIABLES: RATIO OF EARLY-STAGED DEALS TO TOTAL DEALS BACKED BY OF THE VCF					
Independent variables	(1)	(2)	(3)	(4)	(5)
Constant	-0.27 (-1.26)	-0.32 (-1.47)	-0.30 (-1.43)	-0.29 (-1.42)	-0.29 (-1.38)
Capital size (\$mil)	1.7E-006 (0.43)	1.2E-006 (0.33)	6.5E-007 (0.18)	1.5E-006 (0.45)	1.5E-006 (0.43)
Age of the VCF	-0.001 (-0.39)				
Experience of the VCF in China		0.007 (0.69)			
Protection of the products	0.253 (2.70)**	0.257 (2.75)**	0.25 (2.72)**	0.24 (2.67)**	0.24 (2.65)**
If the VCF is under limited partnership?			0.036 (0.60)		0.001 (0.01)
If the VCF is from California or Massachusetts?				0.095 (1.94)*	0.095 (1.82)
R square	0.098	0.102	0.101	0.141	0.141
F-statistics	2.573	2.691	2.648	3.896	2.881

Panel B Regression for VCs' Investment Preferences in the Maturity of the Portfolio Companies

DEPENDENT VARIABLES: RATIO OF THE DEALS INVOLVED IN YOUNG COMPANIES TO TOTAL INVESTMENTS MADE BY THE VCF					
Independent variables	(1)	(2)	(3)	(4)	(5)
Constant	-0.20 (-0.92)	-0.18 (-0.79)	-0.28 (-1.26)	-0.21 (-0.99)	-0.27 (-1.22)
Capital size (\$mil)	-2E-007 (-0.04)	5.5E-007 (0.14)	-5E-007 (-1.13)	-1.1E-006 (-0.30)	-3E-007 (-0.78)
Age of the VCF	0.001 (0.432)				
Experience of the VCF in China		-0.002 (-0.13)			
Protection of the products	0.20 (2.23)**	0.193 (2.00)**	0.20 (2.10)**	0.19 (1.99)**	0.19 (2.04)**
If the VCF is under limited partnership?			0.10 (1.62)*		0.067 (1.03)
If the VCF is from California or Massachusetts?				0.11 (2.04)**	0.196 (1.60)
R square	0.056	0.053	0.086	0.105	0.118
F-statistics	1.411	1.352	2.268	2.810	2.734

6.5.2 VCs' Investment Preferences: R&D Intensity

Table 6.9 reports the estimates of the relations between the R&D intensity of the companies backed by the VCFs and the characteristics of the VCFs. The dependent variable in Panel A is the average R&D spending to total value added of the portfolio companies backed by the VCF. The dependent variable in Panel B is the average R&D spending in new product development to the total value added of the companies backed by the VCF. The independent variables include the capital size managed by the VCF, the experience of the VCF in the venture capital industry, the operating experience of the VCF in China, a dummy variable that equals one if the VCF is under limited partnership, a dummy variable that equals one if the VCF has a pre-set industry preference in the high-technology industry, and a dummy variable that equals one if the VCF is from California or Massachusetts.

In general, the regression analysis confirms that the corporate governance structure and the pre-set investment strategy of the VCF are the major factors that affect venture capitalists' investment choices in technology intensity. However, neither the resource constraints nor the experience of the VCFs in the industry or in the market is correlated with venture capitalists' investment choice in technology.

As shown in Table 6.9, Hypothesis 1a is supported. The dummy variable LPVCF is significantly and positively correlated to the two R&D intensity variables, even while controlling for the VCF's pre-set investment strategy in industry. The significance levels of the coefficients are between 0.07 and 0.10. This suggests that

VCFs under limited partnership invest significantly more in companies with higher R&D intensity than VCFs structured as limited companies. Since R&D intensive companies are normally associated with more agency problems and uncertainties (Riordan and Williamson 1985; Shleifer and Vishny 1992), the results suggest that VCFs under limited partnership are more risk-taking. The findings empirically support the arguments in new institutional economics as previously discussed.

As expected, the pre-set investment strategy is the strongest factor that impacts venture capitalists' investment choices in technology. Both the average ratio of R&D spending to value added and the average ratio of R&D spending in new product development to value added of the companies backed by venture capital are significantly and positively associated with the dummy variable that states whether the VCF has a pre-set investment preference in high-technology industry. This suggests that VCFs that have precise pre-set investment preference in high-technology industry invest more in companies with higher R&D intensity in China. However, none of the variables representing experience in venture financing, local operating experience, and investment experience in California and Massachusetts of the VCF is correlated to investment choices in technological intensity. The results indicate that industry experience and local knowledge do not impact venture capitalists' investment decision on the technology of the portfolio companies in China. Thus, hypotheses 3a, 3d, and 3a are rejected.

Table 6.9 Regressions for VCs' Investment Preferences in R&D Intensity

The sample is 86 randomly selected VCFs in China that have been invested in more than 3 deals in China till the end of 2006. The 86 VCFs have invested in 628 deals in China in total. Estimates are from OLS regressions for both Panel A and Panel B (t-statistics for the regression coefficients are in parentheses.). The dependent variable is the average percentage of R&D intensity of the companies backed by each VCF in the sample. For Panel A, R&D intensity is proxied by industry level of R&D spending to total value added whereas for Panel B, R&D intensity is proxied by industry level of R&D spending in new product development to total value added. Independent variables include a dummy variable that equals to 1 if the VCF is governed under limited partnership, a dummy variable that equals to 1 if the VCF has industry preference in high-technology industry, and a dummy variable that equals to 1 if the VCF is from California or Massachusetts. Capital size is measured by the total amount of capital managed by the VCF in million in constant 2000 US Dollar. Age of the VCF refers the age of the VCF till the end of 2006 that is calculated in year. Experience of the VCF in China is measured by the length of time from the time the VCF started business in China to the end of 2006 that is calculated in year. Asterisks indicate statistical significance at 5% ** and 10% * level.

Panel A Regression for Average R&D Spending to Value Added of the VCF's Portfolios

DEPENDENT VARIABLES: THE AVERAGE R&D SPENDING TO VALUE ADDED OF THE VCF'S PORTFOLIO COMPANIES IN CHINA						
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Constant	3.60 (23.70) **	3.72 (16.21)**	3.35 (15.77)**	3.65 (26.64)**	3.33 (15.32)**	3.42 (12.12)**
Capital size (\$mil)	1.07E-005 (0.83)	1.36E-005 (1.15)	1.08-005 (0.92)	1.37E-005 (1.16)	8.84E-006 (0.69)	9.39E-006 (0.80)
If the VCF has industry preference in high-tech?	0.80 (4.85)**	0.80 (4.84)**	0.83 (5.06)**	0.82 (4.75)**	0.87 (5.02)**	0.87 (5.03)**
Age of the VCF	0.003 (0.63)				0.001 (0.20)	
Experience of the VCF in China		-0.16 (-0.45)				-0.02 (-0.46)
If the VCF is under limited partnership?			0.35 (1.72)*		0.38 (1.74)*	0.39 (1.85)*
If the VCF is from California or Massachusetts?				-0.78 (-0.39)	-0.17 (-0.81)	-0.17 (-0.81)
R square	0.262	0.260	0.288	0.259	0.296	0.298
F-statistics	8.036	7.947	9.186	7.942	5.546	5.594

Panel B Regression for Average R&D Spending in New Product Development to Total Value Added of the VCF's Portfolios

DEPENDENT VARIABLES: THE AVERAGE R&D SPENDING IN NEW PRODUCT DEVELOPMENT TO VALUE ADDED OF THE VCF'S PORTFOLIO COMPANIES IN CHINA						
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Constant	3.56 (18.52) **	3.74 (13.14)**	3.25 (12.57)**	3.58 (20.60)**	3.25 (12.24)**	3.41 (10.08)**
Capital size (\$mil)	1.08E-005 (0.65)	1.30E-005 (0.85)	9.13E-006 (0.60)	1.40E-005 (0.92)	9.59E-006 (0.58)	8.11E-006 (0.53)
If the VCF has industry preference in high-tech?	0.47 (2.24)**	0.47 (2.23)**	0.49 (2.37)**	0.441 (2.00)**	0.49 (2.22)**	0.49 (2.22)**
Age of the VCF	0.003 (0.43)				0.00 (-0.75)	
Experience of the VCF in China		-0.29 (-0.664)				-0.03 (-0.77)
If the VCF is under limited partnership?			0.44 (1.77)*		0.443 (1.64)*	0.45 (1.74)**
If the VCF is from California or Massachusetts?				0.11 (0.44)	-0.002 (-0.008)	-0.005 (-0.18)
R square	0.072	0.075	0.108	0.072	0.108	0.116
F-statistics	1.851	1.943	2.907	1.855	1.697	1.83

Generally, the results of the econometric analysis partially support the hypotheses. It is found that VCFs are separated into groups in investment focuses. The corporate governance structure of VCFs has significant impacts on VCs' investment preferences. That is, VCFs under limited partnership invest much more in younger companies and companies with higher R&D intensity than VCFs structured as limited companies. At the same time, VCFs invest more in younger companies or companies at earlier stages normally emphasize more on the protection of the products and service. Finally, VCFs from California or Massachusetts invest more in early-staged projects and younger companies in China. However, some factors which are widely believed and evidenced as important to understand and explain individual investment activities in the existing literature, such as the capital size of the venture capital funds, the industry experience and local knowledge of the investment professionals and organizations, do not seem matter in VCs' investment preferences in China.

It should be noted that some of the R-square values for the regressions analyses are relatively low. For example, the R-square values for regressions on the ratio of investment in early-staged companies, the ratio of investment in younger companies, and the average ratio of R&D spending in new product development to the total value added of the portfolio companies range from 0.05 to 0.141. Statistically, low R-square values imply that other factors may better explain the dependent variables. However, due to the lack of data in private equity investment, it is almost impossible for researchers to test other possibilities. Low R-square values are thus commonly seen in studies on venture capital investment. For example, the R-square values of the work of Mayer et al. (2005), which examines venture capitalists' investment preferences in four developed countries, range from 0.03 to 0.13. Due to the data constraints, it is beyond the attempt and capability to identify other factors in this study. However, the regressions show that the R-square values substantially increase when the variable on corporate governance structure of the VCF is included into the examinations. The results indicate that the corporate governance of the VCF indeed increases the explaining power of the regressions. That is, venture capitalists' investment preferences in China are indeed associated with the corporate governance structure of the VCF.

6.5.3 Alternative Explanations

While the results from the above sections are consistent with the predictions that institutions have impacts on venture capitalists' investment preferences in China, alternative interpretations may explain the results.

First, it might be argued that VCs' different investment preferences are the results of distinctions between domestic and foreign VCFs rather than the differences in corporate governance of the VCFs. Since the accurate information on the organizational structure of VCFs is not available, it is proxied by the origin of the VCFs in this study. That is, the foreign VCFs are proxied as VCFs under limited partnership whereas the domestic ones are proxied as VCFs structured as limited companies. As a result, the challenge is to what extent the corporate governance of VCFs may explain VCs' investment preferences compared with the differences between foreign and domestic VCFs.

There is indeed amount of literature addressing that the differences in business ethics, human resources and business strategies etc. between foreign and domestic companies may affect the affect individual's business behaviours. For example, it is suggested that normally firms, which are strong enough within the domestic markets, choose to enter overseas markets. That is, compared with Chinese domestic VCFs operating within the local markets, the foreign VCFs may be more aggressive by nature. They therefore take higher risks by investing more in early-staged high-technology companies. However, if this is the case, the capital size and industry experience should be correlated to VCs' investment focuses because in general the capital size and industry experiences are taken as measures for the competitiveness of the VCF. But according to the systematic analysis, the capital size and industry experience of the VCF do not matter on VCs' investment focuses in China. Moreover, the interviews show that the compensation schemes and the delegation of authority of decision-making are the major concerns of VCs in both domestic and foreign VCFs. They suggest that these two factors may further affect the business ethics, human resources and business strategies of a VCF, and, consequently impact on how they structure their investments. More importantly, as stated, there are three foreign VCFs structured as limited companies among the interview samples. Although the sample of these three foreign VCFs is small in number, it provides an interesting opportunity to address some of these issues. It is interesting to notice that the three foreign VCFs, which are structured as limited companies, share many commonalities with their domestic counterparts in terms of the compensation schemes provided to investment professionals and the degree of delegation of authority (see 5.4). Combing the interview findings and the econometric examinations, this study therefore shows that the corporate governance structure of the VCFs indeed seem to have stronger power in explaining VCs' different investment preferences.

Another alternative explanation is that the investment distributions of VCFs are driven by the choices of the entrepreneurs rather than the preferences of the VCs. For example, it might be the case that those entrepreneurs of newly-established high-technology companies may on purpose choose the VCFs under limited partnership for funding rather than other way around. That is, entrepreneurs may select from

which VC they ask for investment. In this case, the statistic relationships seen in the examinations do not necessarily reflect VCs' investment preferences. However, the interviews with entrepreneurs and VCs suggest that at least currently, the demands for venture capital investment are very strong in China. The interviews suggest that, entrepreneurs, especially entrepreneurs of newly-established companies with little track record, have limited chances to win venture capital investment that the probability of entrepreneurs' self-selection effects may be low. The interviews therefore confirm that the segmentation of investment distributions is more likely attributable to VCs' choices rather than entrepreneurs' decisions.

In summary, while the alternative explanations might explain some of the results, the interviews suggest that the incentives provided to the investment professionals by VCFs under different governance structure indeed have impacts on VCs' investment preferences. The results from the econometric analysis in this study are therefore consistent with the interviews with VCs and, the predictions derived from firm theory.

6.6 Discussions and Implications

Risk aversion is a fundamental concern of investors. The key value of venture capital investment is in its widely believed capability to fund newly-established R&D-oriented companies, which are associated with more uncertainty and risks and thus usually neglected by traditional institutional financiers. China has made numerous efforts to promote venture capital programs with the expectation to support young R&D oriented companies. The venture capital industry in China has been greatly developed in terms of the disbursement of the venture investment in the past decade. At the same time, anecdotal evidence shows that many the most successful new high-technology companies were supported by venture capital investment. However, there is no systematic examination on to what extend venture capital investment supports R&D entrepreneurial activities in China and what the major factors are that affect VCs' investment preferences.

Combining field interviews, archive analysis, and systematic econometric analysis, this chapter demonstrates that venture capital investment indeed supports young R&D-oriented companies under the weak regulatory institutions in China. More than 70 per cent of the venture capital deals are in the high-technology industry.

About 90 per cent of the deals were at the early stage or the expansion stage when they were financed by venture capital investment. The results suggest that the capability of venture capital investment to support R&D entrepreneurial activities in China is comparable to that of the most advanced venture capital markets such as the US, Taiwan and Israel.

However, similar to the US practice, venture capitalists differ in their abilities to support young and R&D-oriented companies within China. It is revealed that venture capital firms are divided into different groups by origin; governance structure; capital size; history and industry background; emphases on protection of products and pre-set business strategy etc. Among all the factors, the corporate governance structure of VCFs has significant impacts on VCs' investment preferences in China. VCFs under limited partnership, which is a more decentralized organizational form, invest more in younger companies and companies with higher R&D intensity than VCFs structured as limited companies, which are more centralized in corporate governance. At the same time, the proprietary of products and whether the VCF is from California and Massachusetts are correlated to venture capitalists' investment preferences in terms of development stage and maturity of the portfolio companies.

The evidence indicates that institutional elements, especially regulatory institutions, are more powerful than cost considerations and resource constraints of VCFs in explaining venture capitalist's investment preferences in China. However, the impacts of institutions on VCs' investment focuses in China are not made through the channel of protection of property rights, which is considered as the most important institutional elements that impact on business behaviours. Rather, regulatory institutions like the rules of corporate governance and the protection of intellectual property rights are the major two institutional factors that affect VCs' investment preferences.

Through the fieldwork and archive analysis, it appears that the weak and restrictive legal and financial systems in China have strong impacts on the corporate governance of the VCFs in China. One of the most important consequences of these weak systems is that most of foreign VCFs are structured under limited partnership whereas all domestic ones are structured as limited companies. The difference in corporate governance of the VCFs then influences VCs' investment preferences in

China. The result can be explained by the incentive schemes provided by the two different types of VCFs. VCFs under limited partnership are more decentralized in organizational governance. The investment professionals are offered higher-powered incentives. It encourages VCs to pursue more opportunities by taking a higher risk-return profile. By contrast, VCFs structured are more centralized in management. The investment professionals are provided lower-powered incentives. It may discourage VCs to take risks and uncertainty.

In addition, the protection of intellectual property rights also affects VCs' capability to support entrepreneurial activities in China. Innovative products or service are important for newly-established companies to stimulate the chances of building a viable business model and safeguard future growth and further development. VCs normally emphasize much on the proprietary of products or service when they consider investments in younger companies or companies at earlier stages. Therefore, a stronger protection of intellectual property rights is more important for venture capitalists who invest in early-staged projects to secure the investment return.

As the first exploration and examination on VCs' investment preferences in China, this study contributes to the existing literature on venture capital in China and general studies on institutions. This study provides the first systematic assessment on the impacts of venture capital investment on R&D entrepreneurial activities in China that may contribute to further cross country comparative analysis. It would also appear to reveal the relationship between venture capitalists' investment preferences and the mechanisms used in venture capital investment, e.g. ex-ante project screening, due diligence, contracting, and ex-post monitoring activities as well as other factors. In addition, it also contributes to the literature on institutions. The role of institutions playing on investment activities has long been debating. Cross-country studies are a major approach used in the literature. However, this approach has been challenged due to the endogeneity problems since many cross country factors could not be controlled. By investigating investment activities of VCFs of different corporate structures within one country and one industry, this study tried to identify the specific mechanism through which institutions exert influence. This

study thus contributes to the existing literature with a natural experiment approach to study the impact of institutions.

This study also has implications for both policy-making and business practice. In recent years, many nations have initiated venture capital program with the expectation to accelerate the commercialization of S&T activities and support newly-established, smaller high-technology firms. However, this research reveals that not all VCFs are willing to nurture R&D intensive projects at earlier stages. In the case of China, for example, this study implies that policymakers should encourage certain types of VCFs under different circumstances by adjusting the regulatory institutions. That is, the policymakers may need to consider the legitimacy of the limited partnership as an organizational form for venture capital firms if they wish to encourage more investments in newly-established companies and companies with higher R&D intensity. In addition, it also suggests that the protection of intellectual property rights should be greatly improved if the government intends to promote investments in entrepreneurial activities.

This study may also be helpful for practitioners. The insightful examinations on venture capitalists' investment preferences in China can be helpful to entrepreneurs who are seeking venture financing. They may obtain some information on what kind of VCFs may have interests in their projects. Venture capitalists, which have operated in China, can also benefit from the analysis by gaining more knowledge concerning the investment choices of other venture capitalists who can either be their competitors or collaborators. Finally, this study also has implications to venture capital firms which are considering entering China's venture capital market. The assessment may provide them a general picture on the distribution of this market and where the potential market niche is for newcomers.

Chapter 7 Venture Capitalists' Project Screening Strategies in China

7.1 Introduction

This chapter investigates venture capitalists' ex-ante project screening strategies in China. It examines whether institutions indeed affect VCs' project screening strategy in China by comparing the project screening criteria used by VCs in China and those employed by VCs in the United States and other developed economies. In addition, this study also explores the whether there are differences in project screening among different groups of venture capitalists in China.

As discussed, venture investment encounters serious agency problems and other uncertainty. Ex-ante project screening is considered as one of the most important mechanisms used by venture capitalists to avoid investing in bad projects and consequently mitigate investment risks (Tyebjee and Bruno, 1984; MacMillan et al., 1985). VCs normally screen the business plans they received by analyzing the strengths and potential risks associated with the projects. Averagely, over 85 per cent of business plans are screened out by VCs before further projects investigations (NVCA).

Venture capitalists' screening criteria have been studied extensively by researchers. Focusing on the United States, some studies yield nearly identical investment evaluation criteria (Tyebjee and Bruno, 1984; MacMillan et al., 1985, 1987; Knight, 1994). Overall, the studies reveal that human factors, like entrepreneurs' personality and experience as well as the capability of the management team, are most important for venture capitalists in their project screening. At the same time, the attractiveness of the product or service, market size and growth, business model, customer adoption, favourable competitive position, and cash out potential are also important for venture capitalists in their proposal screening in the United States.

Existing literature suggests that institutions are closely related to the mechanisms used in venture financing. It is anticipated therefore that the screening criteria employed by venture capitalists varies across countries due to different legal and economic environments, market structures, and operating financial systems. However, empirical studies show that venture capitalists across countries have a strong consensus in screening criteria for investment decisions. For instance, similar

to the US practice, criteria related to the quality of the entrepreneur and management team are normally ranked in the first tier for venture capitalists' proposal screening in European countries (Knight, 1994; Muzyka, et al., 1996; Manigart et al., 1996). The consensus is also seen in the screening criteria employed by venture capitalists in developing countries (Ray and Turpin, 1991; Zutshi, et al., 1999).

Nonetheless, there are indeed differences in weighing those factors in venture capitalists' screening criteria across countries. Manigart et al. (1996) find that in younger venture capital markets, such as some European countries, financial information is more important for venture capitalists compared to their US counterparts. Bruton and Ahlstrom (2003) find that entrepreneurs' networks (i.e. *Guanxi*) and the location of the enterprise are important concerns of venture capitalists in Asian countries. Researchers normally attribute these differences in weighing the screening criteria across countries to the distinctions in institutions.

As discussed, China represents a unique economic, political, legal, financial, and socio-cultural environment. In particular, the legal and financial institutions related to venture financing are extremely weak in China (refer Chapter 5 for details). Cross-country studies provide empirical evidence that strong regulatory institutions are important elements to support the use of major governance mechanisms in venture financing (Kaplan et al., 2003; Cummings et al., 2003; Jeng and Wells, 2000). Whether these institutions may affect how VCs screening the business plans in China? What VCs see as strengths and risks from a project in China? The answers to these questions may not only contribute to the academic literature by providing the stylized facts of venture capital investment in China but also contribute to the existing literature on the interaction between institutions and business behaviours. In addition, it may also contribute to policymakers and the practitioners. VCs' screening activities in China, however, have attracted little scrutiny.

Ahlstrom and Bruton (2003) are among the few researchers who have empirically analyzed VCs' investment activities in China. Based on unstructured interviews with foreign VCs in China, the authors find that in general, the screening criteria employed in China are similar to those in the United States. However, the researchers find that the FVCs normally limit their investments within a few regions that are geographically closer to their offices in China, and where they have better

connections with the local governments. The authors attribute these unique findings to the decentralization of China's governance and the large diversity of regulations across regions in China. In addition, these FVCs normally screen out enterprises that have less than three years of track record in China. The authors suggest that this phenomenon is due to the lack of legal protections against outright fraud, the imperfect information and rapid change of the markets in China. Although this study has substantially improved our understanding in VCs' investment activities in China, the sample is limited to FVCs in China whereas the investment activities of DVCs are not covered. In addition, this study is mainly based on the unstructured interviews that it is hard to figure out to what extent the findings with FVCs may be generalized.

The intent of the present study is to obtain more insights into venture capitalists' ex-ante screening activities in China. As discussed in Chapter 5, the regulatory institutions related to venture financing are very weak in China. It is therefore anticipated that VCs in China may be more cautious than their peers in developed economies in ex-ante project screening because they may not be able to gain enough supports from legal and financial institutions for the use of other governance mechanisms. Besides, it is also found that VCFs are divided into two distinctive groups in terms of the governance structure. The examination in the previous chapter finds that these two different groups are different in investment preferences in China, i.e. LPVCFs take more risks than LCVCFs by investing more in younger companies and companies with higher R&D intensity. It is therefore expected that these two different groups of VCFs might emphasize different elements in project screening given they have distinct investment targets.

This study combines both qualitative and quantitative analyses. At the initial stage, thirty nine screening criteria were identified from the existing literature and the unstructured interviews with seven venture capitalists in China. Semi-structured interviews with 37 VCs were then conducted to find out how VCs weigh different criteria and why they give different weights to these criteria. Additionally, unstructured interviews with four entrepreneurs were also conducted to further support the evidence.

In general, this study finds both similarities and differences in venture capitalists' project screening criteria in China compared to those of the US and other

western countries. The analysis also suggests that institutions, especially regulatory institutions, have important impacts on VCs' project screening. Similar to their counterparts in developed countries, venture capitalists in China consider the characteristics of the entrepreneur as the most important factor while screening projects. However, VCs in China are more demanding in project screening compared to their peers in developed economies. They emphasize additional screening criteria like honesty, social networking, and overseas working experience of the entrepreneur and the management team. Additionally, they also pay more attention to public policies and related institutions while screening projects in China. Finally, VCFs under different corporate structures give different weights to certain screening criteria. LPVCFs are more profit-oriented, emphasizing market and financial aspects, and are more sensitive to regulatory institutions. LCVCFs pay more attention to technological aspects of the projects. Besides, it is also found that LPVCFs are more demanding than LCVCFs by imposing more essential and important screening criteria.

This chapter proceeds as follows: Section 2 describes the methods and data in this study. Section 3 documents the screening criteria used by venture capitalists found from the unstructured interviews. Section 4 discusses the findings on the screening criteria of venture capitalists in China from the questionnaire survey. Section 5 describes the characteristics of the rejected ventures in China. Section 6 presents a factor analysis to cross-check the criteria classified priori. The study concludes in Section 7.

7.2 Data and Methods

Different methods including questionnaire surveys, interviews, case studies, and secondary documentary analysis have been employed by researchers in the existing literature on venture capitalists' project screening. Considering the short history of the venture capital industry in China, the lack of study on this topic, and the practical issues concerning empirical studies in China,³⁸ this study employs interviews to explore the screening criteria used by venture capitalists in China.

Guided but not limited by the existing literature, seven venture capitalists were interviewed to determine what criteria they normally use in screening the

³⁸ See Chapter 4 for details.

business plans provided by entrepreneurs. The venture capitalists were asked open-ended questions about what kind of criteria they use in China and whether there are any specific criteria they only employ in China. All criteria were noted. Then, criteria extracted from MacMillan (1985) that are considered widely used in the United States were shown to the interviewees. The venture capitalists were asked to mark any criterion from the list that they did not find appreciable in China. After the cross-check, 38 criteria were identified and classified into seven groups as shown in Table 7.2.

The criteria were then assembled into a questionnaire. Similar to the scaling methods used in MacMillan et al. (1985), the criteria were scaled on a four point scale (Table 7.2). The questionnaire was presented in the semi-structured interviews with 37 venture capitalists from 34 venture capital firms in China in order to test the reliability of the findings from the unstructured interviews. Among the 34 VCFs, 12 are domestic limited companies, 19 are foreign limited partnerships, and 3 are foreign limited companies.

The semi-structured interviews are used to uncover how VCs weigh different screening criteria. The venture capitalists were asked to answer the questionnaire and to specify the ten most important criteria and any additional criteria that they believe are important but were not listed on the questionnaire, as well as their reasons for choosing these criteria.

The venture capitalists interviewed were mainly from larger VCFs measured by the fund size³⁹ since they were mostly active venture capitalists in China. The average amount of funds under management was approximately \$280.66 million for the VCFs; \$344.3 million for the LPVCFs; and \$167.52 million for the LCVCFs. Consistent with the aggregate data, the size of the funds managed by LPVCFs was substantially larger than those managed by LCVCFs.

Despite the small sample size, it covers venture capitalists from some of the most active VCFs in China. As mentioned in earlier chapters, the number of the deals backed by the VCFs makes up about one third of the total deals in China, which reduces the potential bias to some extent. However, sharing the same concern with

³⁹ According to the Zero2IPO survey, the average size of the funds under management of VCFs operating in China was \$78 million in China in 2005. Among the VCFs, the average size of the funds managed by FVCFs was \$255 million, whereas the average size of the funds managed by DVCFs was \$37 million at that year.

MacMillan et al. (1985), this study may inevitably be biased, since it is a self-reported study.⁴⁰ However, all interviews were flexible by nature, and the venture capitalists were asked to explain the reasons for the criteria that they use. It is hoped the self-reported biases may be reduced to some extent.

7.3 VCs' Ex-ante Screening Criteria in China: Qualitative Findings

The unstructured interviews aim at exploring the screening criteria normally used by VCs in China. As discussed, the regulatory institutions related to venture financing are very weak in China (see Chapter 5 for details). It is therefore questioned whether the regulatory institutions may have impacts on VCs' project screening in China; Whether VCs in China may be more cautious than their peers in developed economies in project screening because they may not be able to gain enough supports from legal and financial institutions for the use of other governance mechanisms. In addition, the social culture in China is unique due to the legacy of the long history and complicated social evolution. Whether and how these informal institutions affect VCs' project screening in China also call for insightful investigations.

Guided with the above questions, unstructured interviews with seven VCs were conducted. The interviewees were asked to identify any project screening criteria they normally use in China and why they impose those criteria. The findings of the unstructured interviews are discussed in the following text.

7.3.1 Personality and Experience of the Entrepreneur

Primarily, the unstructured interviews show that, similar to the US practice, venture capitalists consider the characteristics of entrepreneurs as the most important factor when they screen potential projects in China. Both the personality and business experience of the entrepreneur are emphasized by the interviewees. Besides the criteria used by venture capitalists in developed countries listed in the existing literature, the entrepreneur's honesty, social network, and overseas working and educational experience are also seen as very important by venture capitalists in China.

⁴⁰ As stated by MacMillan (1985), it is possible that the respondents were influenced by their perception of what is a desirable response or a response that is seen as appropriate to their positions as financial professionals rather than the criteria they actually use in practice.

The integrity of the entrepreneur is the primary screening criteria. All of the venture capitalists interviewed state that they would not consider a project if they did not think that the entrepreneur was honest. As one DVC illustrated, *‘Yes, the first thing we need to make sure is he [entrepreneur] is honest. By honest, I mean not only to us but to everyone, to their customers, friends, etc. It is the very basic rule one should keep. No business can succeed by cheating, right? As for venture capital, we invest in human beings. In most cases, neither the product nor the market has been tested. It normally takes at least one year before the project breaks even. If the entrepreneur is not trustable, nothing is going to work out for sure...’* (Info: VCF4).

Furthermore, the interviews reveal the extent to which the entrepreneurs exert sustainable effort is also a major concern of venture capitalists. Persistence is important for an entrepreneur, since there are huge amount of unexpected difficulties during the start-up process. One FVC states, *‘Most [entrepreneurs] have worked as managers or engineers in large corporations for years before they started a new business. They have got used to the system that they gained supports from different divisions. But starting up is completely different. Huge amount of problems... they need to solve by themselves. They are CEOs, sales, engineers, secretaries at the same time. They have to play any roles when needed. It is a real challenge for those once worked in large corporations. So, persistence is ultimately important...’* (Info: VCF24).

At the same time, similar to their peers in the United States, venture capitalists in China also suggest that they would expect the entrepreneur to have good communicating skills, passion for their business ideas, and an ability to react and deal with risks.

Venture capitalists show different perspectives on whether they would expect the entrepreneur’s personality to be compatible with their own. Four of the seven interviewees said that compatibility is essential. One FVC said, *‘It’s very important. We are on the same boat with the entrepreneur. We need to share everything during the growth of the business. Mutual understanding and close co-operation is the most important while facing difficulties. So, it’s almost impossible if personally we are not compatible to each other. As a matter of fact, whenever I make the investment decision, I ask myself if I would like to have him/her as a friend first...’* (Info:

VCF16). However, not all venture capitalists agree with this view. One DVC stated, *'Anyway, making investment is not really like date-matching. As long as the entrepreneur is a nice candidate and the project is promising, why I need to bother if there is chemistry? Don't you think sometimes chemistry may mislead? I prefer a more objective strand anyway...'* (Info: VCF8).

Regarding the experience of entrepreneurs, the unstructured interviews show that venture capitalists in China share many commonalities with their US counterparts. Understandings the targeted markets, demonstrated leadership ability, relevant track record of the entrepreneur are emphasized by venture capitalists in China. Venture capitalists also pay special attention to whether the entrepreneur is recommended by a trustworthy source. Three of the seven interviewees stated that they would not consider the deal if the entrepreneur was not introduced through a trustable channel. Venture capitalists suggest that a trustworthy channel works as an important screening system in China. One FVC states, *'People in China value their reputation and network much. They would not recommend someone they themselves don't trust or a project they themselves don't feel well. Similarly, if the entrepreneur knows we have common friends, he/she would much more behave... it helps to make judgement at the initial stage'* (Info: VCF2).

At the same time, venture capitalists also suggest that the recommendation through trustworthy sources may help them in taking due diligence. As another FVC addresses, *'It's always hard to gain accurate information for due diligence anywhere, but it is even harder in China. Some very simple services like credit or business record checks don't exist in China. We have to check the information through very personal channels. Besides, tend to avoid saying negative things about others here. So, if you do not have someone who is an internal, it is hard to gain real information.'* (Info: VCF 16).

Another interesting observation is that most venture capitalists, especially FVCs, suggest that overseas returnees (*Haigui*) entrepreneurs who have both overseas educational and working experience and local knowledge are desirable candidates. Some venture capitalists believe that entrepreneurs who have both overseas and domestic backgrounds may have better understanding of both markets and thus more visionary business strategies. Most venture capitalists, especially

FVCs, aim to exit the investment through IPOs of their portfolio companies in overseas stock markets. The overseas working background of the entrepreneurs and the management teams are seen as an advantage when they go IPOs in international markets. As one FVC notes, *‘Although normally the management team is changed before IPO, the overseas background of the founders is still helpful. It signals that the business is not just a China specific one, it has all connections to the outside world...At the same time, it is much easier for US people to understand who a former engineer in IBM is and what the guy may work out, isn’t it?’* (Info: VCF 2).

Another FVC states that they may more easily achieve mutual understanding with entrepreneurs who have an overseas background: *‘You need common language for communications. Anyway, venture investment is an imported concept in China. Some commonly used tools are never heard by people in China. If the entrepreneur has never worked outside China, it is hard for him/her to understand why he/she has to give up sufficient proportion of the shares to VCs while taking many attached conditions and terms. They may hardly understand how options or preferred stocks work...Of course, it’s a coaching process, but common language is important. We have time and energy constraints anyway’* (Info: VCF 22).

However, not all venture capitalists consider the entrepreneur’s overseas background as an advantage. One participant states, *‘The essence is not whether he/she has worked in the US. The essence is whether the project fits this market well and if he/she may implement the business strategy locally.’* (Info: VCF4). In addition, some venture capitalists are concerned with the overpricing of projects founded by ‘Haigui’ (overseas returnees) entrepreneurs. One FVC says, *‘I have made some deals with ‘haigui’ entrepreneurs. But I did not see real benefits. They hardly adjust their expectations in China. They measure everything with Silicon Valley standards, the compensation scheme, the working environments, the value of the business, etc. So, everything is overpriced. If the price is the same to the US, why I come to China? The lower cost is always the most attractive part of China...’* (Info: VCF 16).

In summary, venture capitalists in China share many commonalities with their US peers in terms of their screening criteria on the characteristics of entrepreneurs’ personality and working experience. According to the unstructured

interviews, the integrity, persistence, and overseas working experience are most often noted by venture capitalists in China.

7.3.2 Management Team

Associated with the emphasis on the entrepreneur's characteristics, venture capitalists in China are concerned about the quality of the management team of the potential projects. Even though for most start-up projects, management teams are not yet formed at the time of fundraising, venture capitalists take the quality of the initial management team as an important criterion. Similar to the practice in the United States, the relevant experience of the management team members and the balance of the team composition are the major concerns of venture capitalists in China. Venture capitalists in China prefer that the management team have overseas working experience for the same reasons that they prefer entrepreneurs to have overseas experience.

Some venture capitalists prefer a management team with good government connections. As a FVC addressed, *'I don't mean corruption, nothing related to this. But good connection with governments is always important. There are some very helpful high-technology encouraging programs provided by both local and central governments. The managers need to know where and how they may have the supports. At least, the managers must have timely information about public policies and regulations. Keeping a good connection may help them to have the information and better understand the rules. This is extremely important in China since they (governments) have so many new rules issued all the time and sometimes the rules are not clearly clarified I have to say...'* (Info: VCF11).

However, not all venture capitalists in China see this connection with the government as important. One FVC illustrates: *'No, it [the connection with governments] is not important. You know there is a Chinese saying, i.e. unshakable bureaucratic, flowing soldiers. The officials are changing, especially in China when the society is so dynamic. You can hardly rely on the connections actually.'* (Info: VCF16). Furthermore, there are some venture capitalists, especially FVCs that consider close connections with the government as a disadvantage. One FVC states, *'As long as the people have got used to relying on the so-called connections, they would be corrupted and losing the capability to face real market competitions. This*

is not for long run success. We have very bad experience. We once invested in a project whose CEO had close connections with the officials of the local government. We thought it would be beneficial. However, it turned out that all the striking performance shown in his earlier years was based on the so-called connections. The local government gave him some funds and purchased products from his enterprise...But when the government officials changed and the guy need to expand the market and raise funds by his own, he was totally lost...' (Info: VCF2).

7.3.3 Products and Service

Similar to the practice in the United States, another important project screening criteria for venture capitalists in China are the characteristics of the products and services of the projects. The market acceptance and proprietary of the products and services are considered most important by venture capitalists in China. Some venture capitalists also see the potential for export of the products and service as an advantage.

According to the unstructured interviews, consistent with MacMillan et al. (1985), the extent to which the products or services may be accepted by the market and whether they may sustain the proprietary advantages are the main concerns of venture capitalists during project screening. In particular, demonstrated market acceptance of the products or services is considered an important advantage. As one DVC addresses, *'A product without market acceptance is always like a person without blood. Market is the source of life for a business. So, no matter how capable the entrepreneur looks like and how perfect the products or service are, if they could not clarify where the targeted markets are, how the products or service will work on the market, I could hardly consider to invest in the project. So, if the products or service has shown promising signals about market acceptance, it can be a great plus.'* (Info: VCF 3).

Furthermore, many venture capitalists suggest that the potential of the products for export is an advantage since the *'products made in China are superbly competitive in price. And, made in China does not necessarily mean the low-end labour-intensive products anymore. Many high-end products are exported at much lower price. This is the key competitiveness of China's enterprises. So, as long as the*

products are feasible to overseas markets, I would be much more confident in the projects...' (Info: VCF22).

The venture capitalists also claim that whether the product or service is proprietary is important given that intellectual property rights are not well-protected in China. *'I would not say that patent is important. After all, the law enforcement for copy rights or patents is not really strong. But I would definitely hope the products can be protected by some ways, either business secrets or some unique technologies. The entrepreneur must keep this in mind. How to sustain the market advantage is the hardest thing in China. People learn and copy so fast. You may expect a bulk of same products entering into the market at half price right after the first comers...'* (Info: VCF 1).

Moreover, a few venture capitalists suggest that whether the product or service of the project is complementary to their other portfolios or business can also be a factor. This consideration is not limited to portfolio management of VCs in China; some also take worldwide portfolios into account: *'Different regions have their own advantages. Of course the best way is to play to one's strengths. As we focus on IT industry, our portfolios in the US are mainly focused on R&D; the ones in Taiwan are mainly on manufacturing; China is the best for assembling. Yes, we try to co-ordinate with other offices to see if there can be any linkages between the potential portfolios...'* (Info: VCF 22).

However, even though most venture capital backed companies are in high-technology sectors, whether the products or service are categorized as 'high-technology' is not considered important by venture capitalists in China. This is consistent with the findings of MacMillan et al. (1985). In general, venture capitalists emphasize the market feasibility of the products or service when they assess projects in China.

7.3.4 Characteristics of the Market

According to the unstructured interviews, market factors are strongly emphasized by venture capitalists in China. Venture capitalists in China pay more attention to the market factors of the potential projects compared to their peers in the United States. Almost all venture capitalists interviewed showed great interest when they were asked about the market aspects of business in China. As one FVC

illustrates, *'Market, market, and market, it is the most attractive part of China, isn't it? I am sure that everyone who looks at China is excited about the huge market potential. You may easily have ten times of consumer population more than that in a middle-sized European country, not mention the export potentials. It is amazing... As long as the project can catch the market, I would not miss it for sure...'* (Info: VCF16).

Venture capitalists in China emphasize the growth rate of the targeted market of the project, the capability of the project to create new markets and stimulate the existing market, and the entry barriers of the targeted market for latecomers. Furthermore, the hand-collected data show that the scale of the market is also the major concern of venture capitalists in China. As one FVC addresses, *'The scale of the market is critical though sometimes people do not think this is a problem in China. Yes, it has great potentials for sure. But, some entrepreneurs do not really know the market. They take for granted that China is the largest market. But this is not exactly the case. After all, about 80 per cent of the population in China is not really ready for quite some consumer markets though the rest 20 per cent is already huge. And the competition in China is also very violent. So, the scale and the growth rate of the market are very important for newly-established companies. It determines how far the sector and the companies may go...'* (Info: VCF 22).

7.3.5 Geographical Factors

Some of the existing literature suggests that venture capitalists also view the geographic location of the portfolio companies as another important factor. This holds true for VCs in China. First, the supply of human resources and public policies are important considerations of venture capitalists in China. One DVC suggests, *'Yes, how much the local governments support entrepreneurship activities and venture investment is important. It determines how well the infrastructure can be developed and how much potential of the local resources can be extracted. It is not necessary that everyone is crowded in the large cities such as Beijing, Shanghai and Shenzhen. But, a smart business person must know that a friendly government is always important for him/her to succeed. This is critical in China.'* (Info: VCF 3). One FVC points out that better educational and research environments provides easy access to markets.

Some researchers also suggest that venture capitalists prefer to invest in projects that are located close to their office or home in order to monitor enterprises more easily. According to Mason and Harrison (1996), half of venture capitalists like to invest within 50 to 100 miles from their offices. Bruton and Ahlstrom (2003) show that FVCs in China prefer close locations of potential projects in order to have more access to information for due diligence and closer relationships with local authorities. However, according to the interviews conducted, most venture capitalists in China do not consider the distance from the location of the project as a critical factor. As one FVC said, *'I don't think the distance matters. Given the convenience of communication, the physical boundaries are getting to be ambiguous. It only takes 3 hours to fly from Beijing to Tibet, no mention we all have the internet, mobile phones, all kinds of communicating ways. Sometimes driving to Zhongguancun from my office in Beijing during rush hours is even more time-consuming than flying to Shanghai. So, there is no point that I may monitor the companies better if they are my next door neighbours'* (Info: VCF19).

Furthermore, one FVC suggested that geographical closeness is not really helpful for information collection, since people are mobile. *'It doesn't make much sense to be closer to the companies. People move much, particularly in China at current time. How many chances you may meet someone in Beijing who was born or educated here? How often you can reach your friend with the same business card within five years? If you don't, how could you imagine that you may have better access to information just because the entrepreneur is located close to you? No, I don't see obvious advantage from the so called same-city-model for information collection.'* (Info: VCF 16).

7.3.6 Financial Considerations

The interviews also show that financial considerations are part of the screening criteria of venture capitalists in China. Consistent with the existing literature, the major financial concerns of venture capitalists in China are the upside potential and liquidity. Similarly, whether the investment is the first round and whether the venture capitalists are expected to be involved in the subsequent round of financing are not seen as important factors. Concerning the return, according to the unstructured interviews, most of the venture capitalists stated that they would

expect payout within 5 years, which differs from 10 years expected from capitalists in the US (MacMillan, 1985). *‘We expect the return sooner in China. All the China-focused funds are new. We need beautiful performance to raise further funds. People in the West are still lack of knowledge about China. We need to show how attractive the market is in short run. And, in fact, there are not many real R&D projects in China. The opportunities here are to make good use of the huge market and the low cost of skilled labours. These kinds of projects should cash out sooner’* (Info: VCF17).

Overall, a total of 38 screening criteria were identified from the unstructured interviews. It shows that venture capitalists in China share many commonalities with their peers in the United States in terms of project screening criteria. Almost all the criteria mentioned in the existing literature are employed by the venture capitalists in China. The unstructured interviews also show that VCs in China indeed seem to be more demanding in ex-ante project screening by imposing more criteria. It uncovers additional criteria employed by venture capitalists in China including the integrity and overseas educational/working background of the entrepreneurs, the scale of the targeted market, the export potential of the products, and the public policies of local governments. However, questions like to what extent the qualitative findings may represent the population, whether venture capitalists from different types of VCFs employ the same screening criteria, and the weight of related criteria call for a more objective analysis based on a larger sample.

7.4 The Weight of Screening Criteria: Findings of Semi-structured Interviews

This section presents the findings from semi-structured interviews with the 37 VCs. The Semi-interviews focus on exploring how VCs in China weigh different project screening criteria and the rationales underlying the rankings. The findings are reported together with the discoveries in the United States and some other western countries extracted from the existing literature. In addition, the distinctions in screening criteria among different groups of VCFs are also reported.

Semi-interviews are divided into two parts. The first part consists of close-ended questions asking VCs to weighing the 38 screening criteria identified through the unstructured interviews. VCs’ screening criteria are classified into seven groups. Group I refers to entrepreneur’s personality; group II, entrepreneur’s experience;

group III, the management team; group IV, the characteristics of product/service; group V, the characteristics of the market; group VI, geographical aspects; and group VII, financial considerations. The criteria are in a four point Likert-like scale, where 1 is irrelevant; 2 is desirable; 3 is important; and 4 is essential.⁴¹ The second part of semi-structured interviews is open-ended questions asking VCs to explain the rationale for the weighing and add any further information on their project screening strategy in China. The findings from the semi-structured interviews are reported in the following subsections.

Table 7.1 presents the means and standard deviations of the responses of semi-structured interviews in China along with the responses of questionnaire survey in the US undertaken by MacMillan et al. (1985).⁴² Table 7.2 provides the major screening criteria (i.e. the criteria that were rated as important or essential by VCs) employed by venture capitalists in the United States, Europe, Canada, Asia-Pacific area, and Singapore consolidated by Zutshi et al. (1999) and the findings in China for further comparison. Besides, the responses of VCs from LPVCFs and LCVCFs in China are presented separately in Table 7.3. The findings are reported in details in the following subsections.

7.4.1 Characteristics of the Entrepreneur and Management Team

Primarily, similar to the US practice, human capital factors are the most important concerns of venture capitalists when they screen projects in China. As shown in Table 7.1, sixteen of thirty eight criteria are related to human capital. Table 7.2 shows that six of twelve factors, which are considered important, are related to human capital. In addition, over seventy per cent VCs in China suggest that the composition of management team is an essentially important factor they would consider in project screening. Furthermore, the standard deviations for the responses

41 The four point weighting system used in this study was borrowed from MacMillan et al. (1985). Each point was defined as follows:

1. Irrelevant-not a factor in the decision-making process.
2. Desirable-a factor that improves the likelihood of investment.
3. Important-a factor that must be present in order for an investment to take place, unless other factors specifically compensate for this factor's absence.
4. Essential-a factor that must be present under any circumstances in order for an investment to take place.

42 Even though the study of MacMillan et al. (1985) was undertaken more than twenty years ago, it has been extensively employed by researchers in either cross-country studies or studies on this topic in the United States. Following studies do not show much difference from this research.

concerning human aspects are small. This confirms that there is a strong consensus on the need of these human capital factors for staying power.

In terms of the personality of the entrepreneur, venture capitalists in China see the capability of the entrepreneur to exert sustainable effort and react to risks as the most important factors. Whether the personality of the entrepreneur is compatible with the venture capitalists is considered the least important factor. These findings are consistent with the practices in most other countries.

Besides the similarities, venture capitalists in China see the honesty and social networks of the entrepreneur as important factors as well. Honesty is the most important factor of an entrepreneur's personality emphasized by the venture capitalists in China. According to the semi-structured interviews, the major reason for venture capitalists' emphasis on the above two factors are the weak legal and accounting institutions in China. As one FVC illustrated, *'You can hardly rely on the laws and regulations in China. As you know, most of them are changing all the time and they don't really enforce...Anything related to legal procedures may cost a lot, not only money, but time, energy and so on. And, you should not expect timely enforcement. I had the experience...So, honesty of the founders is extremely important in China. If he does not cheat, things can be much smoother in any case'* (Info: VCF26). In addition, venture capitalists suggest that the lack of standard accounting and auditing systems in China influence them to rely more on the entrepreneur's honesty to reduce information problems.

The social network of the entrepreneur provides another way to overcome the burdens in legal and other regulatory institutions. As one FVC said, *'There is almost no way to run business in China if he [entrepreneur] does not have 'Guanxi' (i.e. social network). Things are subtle here. Everything depends on if you have an acquaintance even for some tiny-tiny problems. The regulations and policies are unclear sometimes. People can interpret and implement them in any way. A registration procedure may cost five days to three months or even more in the same city under the same conditions. The only difference is if you know someone internal. No, I'm not talking about something like bribes. Normally, it does not involve corruption. Since the rules here are not binding sometimes, people just do things as they like. So, a nice network helps a lot'* (Info: VCF19). These explanations indicate

that venture capitalists take the honesty and social network of the entrepreneur as compensating ways to deal with weaknesses in regulatory and normative institutions in China.

Furthermore, concerning the experience of the entrepreneur, venture capitalists in China share many similar views with their peers in other countries. As shown in Table 7.1, they consider familiarity with the targeted market and demonstrated leadership as the most important requirements on entrepreneur's experience. Of least concern is familiarity with the entrepreneur's reputation; the standard deviation is higher than most of other factors. The findings are similar to discoveries of the existing literature.

However, whether the entrepreneur has a relevant track record is not emphasized by venture capitalists in China as much as in the United States, Europe, and Singapore. Nonetheless, the mean score for the responses on this factor is 2.91, which is reasonably high. It is interesting that the result is similar to the findings in Asia-Pacific and Canada. In the case of China, many businesses in China are new, especially in the sectors in which venture capitalists show more interest, such as the Internet, mobile communication, and Semi-conductor. Many entrepreneurs who have innovative ideas and the passions to start companies are very young. This might be a plausible explanation for why venture capitalists do not emphasize the entrepreneur's track records that much in China.

The questionnaire also tests the weight of overseas experience of the entrepreneur. The mean of the responses for this question is only 2.09, which is the second least concern of venture capitalists in China, but the standard deviation is the highest for this response. This indicates that venture capitalists have significantly different views on the overseas experience of the entrepreneur. For some VCs, the overseas experience of the entrepreneur is utmost important whereas for some others, it is not a factor they would consider. This result further confirms the findings from the unstructured interviews.

Finally, concerning the requirements for the management team, similar to the US practice again, over 70 per cent of VCs in China consider the composition of the management team is an utmost important factor for an investment. Moreover, over 56 per cent of VCs in China consider a functionally balanced management team is

essential for a project that is almost the same to the findings in the United States. The results suggest that a balanced management team is a great advantage for the project to attract venture financing in both China and the United States.

However, an interesting observation is that in the United States, 20 per cent VCs consider a project initiated by only one person who has relevant experience and idea as attractive whereas only 5.8 percent of VCs in China consider that as a plus. It suggests that VCs in China normally screen out a project which is initiated by only one person even if the entrepreneur has relevant experience and ideas. The interviews show that the reason is mainly related to the lack of professional consulting services and the complexity of the market and institutions in China. As a FVC said, *'Management team is always essential. You can never make a team with one person, right? A company, even a very small start-up has to face various problems. And, people have different expertise. If it is in the US, you might be able to get some assistance from consulting firms or professional services to compensate, but not here in China. Besides, China is so dynamic and complicated, it is impossible for an entrepreneur to handle everything. It must be a team ...'* (Info: VCF23).

This study also compares the screening criteria employed by VCs from the two different groups of VCFs. As discussed in the previous chapter, LPVCFs take more risks by investing in younger companies and companies with higher R&D intensity. It is therefore predicted that the venture capitalists from LPVCFs may be more demanding than those from LCVCFs in ex-ante project screening in order to control the higher risks they take. The semi-structured interviews confirm this assumption by providing evidence that venture capitalists from LPVCFs are indeed more demanding in terms of requirements for the personality and experience of the entrepreneur. As shown in Table 7.3, the mean for the responses on the entrepreneur's personality is 3.13 for LPVCFs and 2.82 for LCVCFs. Moreover, the mean for the responses on business experience is 2.81 for LPVCFs and 2.52 for LCVCFs.

In addition, the two different types of VCFs give different weights to the human capital factors. For example, LPVCFs consider whether the entrepreneur is articulate in discussing venture as an important factor, whereas LCVCFs do not. The

responses from the venture capitalists in LPVCFs on this factor are similar to those of their US peers.

Furthermore, LPVCFs pay more attention to whether the personality of the entrepreneurs is compatible and whether the entrepreneurs have overseas working experience. However, it is noted that the standard deviations for these responses are high that indicates that there is no strong consensus among LPVCFs concerning the two factors. This result confirms the unstructured interviews that some foreign VCs, who are mainly from LPVCFs, suggest they prefer the entrepreneur has overseas working experience with enough knowledge on legal and financial systems in western countries, especially the United States. In addition, some foreign VCs pay more attention to whether it is easy to get along with the entrepreneur since they suggest venture financing by nature is '*an investment in people*' (Info: VCF3). However, some other interviewees would suggest that they do not really take these two factors as important factors since '*the key is always the whether they (entrepreneurs) may make it, rather than what they had in the past...*' (Info: VCF32).

Moreover, LPVCFs pay slightly more attention to the composition of the management team than LCVCFs do. As seen in Table 7.3, about 74 per cent of LPVCFs consider management team composition is an essential factor whereas the ratio for LCVCFs is 67 per cent. At the same time, similar to the practice in the United States, both LPVCFs and LCVCFs prefer to further investigate the project with a functionally balanced management team. However, it is interesting to notice that the ten per cent LPVCFs consider a project, which is initiated by only one person with relevant experience, is essentially attractive whereas no LCVCF would invest in projects like that. At the same time, only five percent LPVCFs consider a project, which is initiated by people with similar experience, as an interesting one where as over 13 per cent LCVCFs would like to further evaluate that project. In general, comparing the findings in China with the observations in the United States, it is seen that the views of LPVCFs on the composition of management team is similar to those in the United States.

7.4.2 Characteristics of the Product and Market

Regarding the requirements on product or service, as seen in Table 7.1, whether the product has been developed to the point of a functioning prototype is the

least concern of venture capitalists in China. Furthermore, whether the product is identified as high-technology is not considered important by venture capitalists in China. These two findings are consistent with the practice in the United States.

However, venture capitalists in China view demonstrated market acceptance as the most important product/service related factor that is not considered as important by VCs in other countries except Singapore. This result confirms the findings from unstructured interviews. It indicates that venture capitalists in emerging economies may emphasize more on the present market side of a product or service.

Associated with the above phenomenon, VCs in China do not take whether the product is proprietary or can be otherwise protected as an important criterion in project screening. As shown in Table 7.2, this observation is similar to the practice in almost all the other countries except the United States. This result reflects the concerns from venture capitalists on the R&D capability of Chinese ventures. As one FVC mentioned, *'If we talk about the originality of the R&D projects, I should say, China is not the place to seek for them yet, at least not now. There are some innovative projects here, but mainly in application, business model and marketing... not research though. It is improved but we need to wait...So, it is different from real R&D projects that you must guarantee it is not stolen. Business model and marketing are normally more like arts that cannot be copied directly...'* (Info: VCF 32).

Regarding the criteria on the targeted market, similar to the practice in almost all the other countries, the growth rate of the targeted market is seen by VCs in China as the most important market factor. In addition, VCs in China pay the least attention to whether the product or service may create a new market that is again similar to their peers in the United States. These phenomena suggest that in most countries, the market growth is the utmost important element VCs normally concern.

A unique observation is that the scale of the potential market, which is not identified by VCs in other countries as a project screening criterion, is identified and considered as important in China. It confirms the findings of the unstructured interviews that suggest VCs view the market size and the potential growth of the market as the most visible strengths of China.

According to the semi-structured interviews, there are no visible differences between LPVCFs and LCVCFs concerning their views on product and market potential. Nonetheless, LPVCFs are marginally more demanding in the both factors. Additionally, LPVCFs pay more attention to whether the project may be complementary to their other portfolio companies. These results suggest that there is a high consensus among venture capitalists from different types of VCFs in China concerning their requirements in terms of market and product aspects of the project. However, LPVCFs take the externality of the individual project to the whole portfolio into the consideration in order to reduce risks and gain higher returns.

7.4.3 Characteristics of Geographical Considerations

It is interesting to note that differing from their peers in other countries, VCs in China take the geographical location of the potential portfolio companies as a general concern in project screening. As shown in Table 7.1, geographical considerations including the supply of human resources, the local policies, the geographical distance and whether the company is located in capital or other major cities are identified by VCs in China. Among all these factors, the most important aspect of geographical concern appears to be whether the needed human resources of the location are rich. It further evidences the importance of human factors from the venture capitalists' point of view.

Another important finding is that the local public policies are heavily emphasized by VCs in China. As seen in Table 7.1, the mean for the responses on this factor is 2.97 that is very close to 3 which is a measurement for 'important'. The responses suggest that the friendliness of local government to entrepreneurship and venture capital investment is important for VCs to determine whether to invest in projects in this area. It suggests that public policies are major concerns of financiers in China. At the same time, it also indicates that regions in China are diverse not only in terms of natural environments but also in terms of institutions. This finding is consistent with the explorations of Bruton and Ahlstrom (2003).

Additionally, some VCs suggest that where the entrepreneur locates his/her business may reflect how well the entrepreneur understands the factors that critically influence his/own business and how he/she designs the strategy of the business. As

one FVC states, *'It's a useful way to evaluate the business sense of the entrepreneur. For example, I would hardly imagine someone would finance an entrepreneur who starts up computer software in Inner Mongolia. No human capital, no treatments of public policies, no network of the business... Nothing there is related to software. But, we invested in diary manufacturing there. And as you know, it works extremely well. So, if the entrepreneur does not have common sense about the local strengths and weaknesses, there is no way for the business to win'* (Info: VCF 30).

The other interesting observation is that the least important factor concerning the geographical considerations is the distance from the venture capitalist's office to the location of the potential portfolio company. The low standard deviation of the responses for this factor further evidences a high consensus among venture capitalists in China that do not consider physical distance as important. The result differs from the existing literature, which suggests that venture capitalists normally prefer to invest in enterprises within 50 miles from their home or office in order to gain more information about the portfolio companies and the entrepreneurs. Furthermore, it is also different from the findings of Bruton and Ahlstrom (2003), who provide evidence that FVCs in China normally invest in companies closer to their office.

The potential explanation for the difference is that most of the studies on venture capitalists' screening criteria were made in the 1980s and the early 1990s in the United States, when the Internet and mobile tele-communication were not used widely and commercially. In the case of China, the Internet industry and tele-communication were developed with the venture financing industry simultaneously that provided venture capitalists easy accesses to entrepreneurs and information; this was stated by the interviewees for times. With this improvement, venture capitalists in China do not take physical distance as a serious problem that influences on their ex-post monitoring activities.

Regarding the differences between the two types of VCFs in their geographical considerations, the analysis shows that LPVCFs are again more demanding than LCVCFs. In particular, LPVCFs pay substantially more attention to local public policies of the location where the portfolio company operates. As one FVC said, *'The local government is extremely important. As you know, venture capital is new in China. There are many issues in venture financing are not*

understood by people here. So, if the local policies not friendly, we may have lots of troubles. Even though local laws are not binding for us, the local officials always have ways to set burdens to you and your projects. We are not affordable for the waste of time and energy. So, if the local government is not really friendly, we would not invest in the project located in that area...' (Info: VCF16).

The result indicates that the role of the local government is critically important in the view of most foreign venture capitalists, which are mainly structured as limited partnership. The potential explanation is that most LCVCFs are domestic ones and backed by either government agencies or large corporations; thus, they have more ties to local government, making it easier to lobby or solve problems related to local policies.

7.4.4 Financial Considerations

Similar to their counterparts in the United States and other developed countries, VCs in China take the financial potential of the project as major concern. As seen in Table 7.1, the most important financial criterion for VCs in China is the project may create ten times of the investment within five to ten years that is similar to the practice in the United States. It indicates that the high return potential is what VCs look for all over the world including China. In addition, it also provides evidence that differing from traditional financiers, VCs normally set up a higher risk-return profile with a long-term investment strategy in China. This phenomenon is again similar to the practice in the United States.

The second important criterion is the liquidity of the investment. Similar to their peers in the United States and Singapore, VCs in China consider whether the investment can be easily made liquid as an important factor in project screening. This finding supports the unstructured interviews. As discussed in the previous chapters, venture capital investment normally exits within ten years due to the limited life span of venture funds. In this study, over half interviewees are from LPVCFs, which have almost the same governance scheme of venture funds to those in the United States. This may therefore explain why the liquidity of investment is emphasised much by VCs in China.

In addition, also similar to the practice in the United States, the least emphasized factors concern subsequent investment. This is the same as most findings

in the existing literature. As shown in Table 7.1, VCs in China do not view if they would be expected to make subsequent investments or to participate in latter rounds of investment as important. This confirms the expected result, which was based on the fact that stage financing is widely used by VCs. That is, VCs normally do not invest the entire fund needed upfront; rather, they invest by instalments in order to reduce the potential loss from bad projects⁴³ (Gompers, 1995; Sahlman, 1990).

Finally, LPVCFs are again more demanding than LCVCFs regarding the concerns on financial aspects of the project. As seen in Table 7.3, the mean of the responses for financial considerations is 2.60 for LPVCFs and 2.40 for LCVCFs. There are some visible differences between the venture capitalists in the two types of VCFs in terms of their financial requirements. First, LPVCFs consider high return and high liquidity as important factors, while neither of these factors is seen as important by LCVCFs. The responses of LPVCFs are similar to the findings of those in the United States. Furthermore, LPVCFs are more likely to consider if the project has a chance to attract future investors. A plausible explanation is that LPVCFs are more profit-oriented than LCVCFs that they pay more attention to the financial return. In addition, LPVCFs face harder budget constraints than LCVCFs that they take the liquidity of the investment as an important factor in project screening.

Overall, the findings from the semi-structured interviews support the major findings of the unstructured interviews. Primarily, the major criteria employed by venture capitalists in China are similar to those used in the United States. Human aspects are the dominant concerns of venture capitalists when they screen projects in China, which is the same practice used in developed countries. The growth rate of the targeted market and the financial return and liquidity are also major concerns of venture capitalists in China.

However, there are also some unique phenomena in China. In general, venture capitalists in China are more demanding than their counterparts in other countries by imposing more requirements when they screen projects. The honesty, social network and overseas working experience of the entrepreneur are seen as important human factors in project screening in China. In addition, the scale of the targeted market and the market acceptance of the product or service, which are not

⁴³ For more about stage financing in China, see Chapter 8.

considered as screening criteria in other countries, are important concerns for VCs in China. Finally, geographical considerations, especially, the local public policies and the supply of human resources are emphasized by VCs in China.

Moreover, different types of VCFs are diverse in project screening in China. Overall, LPVCFs are more demanding than those of LCVCFs: fifteen of thirty eight screening criteria are considered important by LPVCFs whereas only nine screening criteria are important for LCVCFs. Additionally, LPVCFs share more commonalities with their peers in the United States and other developed countries in screening criteria than LCVCFs, especially in terms of human resources and financial aspects.

Another interesting observation is that the standard deviations of the responses from venture capitalists are notably lower in China compared with those in the United States. The finding is consistent for almost all criteria. It suggests that there is a stronger consensus among venture capitalists in China in their project screening criteria. The potential explanation for this phenomenon is that the venture capitalists are either new to China's market (e.g. FVCs) or new to the venture financing industry (e.g. DVCs). They are still in the process of learning and may tend to be more general in ex-ante screening. However, because the venture capital industry in the United States is much more developed, practitioners differentiate from each other through various special investment preferences and, consequently, retain more dispersed screening criteria.

Table 7.1 Screening Criteria Employed by VCs in China and the US

	CHINA		US	
	Mean	SD	Mean	SD
Group I: Entrepreneur's personality---the entrepreneur:				
1. is honest enough.	3.68	0.475		
2. is capable of sustained intense effort.	3.65	0.485	3.60	0.57
3. is able to evaluate and react to risk well.	3.35	0.544	3.34	0.73
4. articulates in discussing venture.	2.88	0.409	3.11	0.71
5. attends to detail.	2.38	0.551	2.82	0.69
6. has a personality compatible with mine.	1.97	0.870	2.09	0.81
7. has rich social network.	3.03	0.388		
Group II: Entrepreneur's experience---The entrepreneur:				
8. is thoroughly familiar with the market targeted by the project.	3.74	0.448	3.58	0.57
9. has demonstrated leadership ability in past.	3.21	0.410	3.41	0.67
10. has a track record relevant to venture.	2.91	0.514	3.24	0.69
11. was referred to me by a trustworthy source.	2.26	0.618	2.03	0.62
12. I am already familiar with the entrepreneur's reputation.	2.03	0.627	1.83	0.71
13. has overseas educational and working experience.	2.09	0.933		
Group III Characteristics of the products or service:				
14. The product is proprietary or can otherwise be protected.	2.94	0.629	3.11	0.71
15. The product enjoys demonstrated market acceptance.	3.26	0.511	2.45	0.74
16. The product has been developed to the point of a functioning prototype.	2.18	0.576	2.38	0.90

17. The product may be described as “high tech.”	2.15	0.702	2.03	0.96
18. The product has great potentials for export.	2.03	0.460		
19. The product or service is complimentary to our other portfolios.	2.09	0.621		
Group IV Characteristics of the market:				
20. The target market enjoys a significant growth rate.	3.71	0.462	3.34	0.64
21. The venture will stimulate an existing market.	2.35	0.485	2.43	0.75
22. The venture is an industry with which I am familiar.	2.06	0.547	2.36	0,78
23. There is little threat of competition during the first three years.	2.82	0.387	2.33	0.72
24. The venture will create a new market.	1.94	0.489	1.82	0.83
25. The market size is scalable.	3.18	0.576		
Group V Geographical considerations:				
26. The project is located in capital city or other major cities in China.	2.26	0.511		
27. The project is located within 50 miles to my office.	1.24	0.431		
28. It is easy to access needed human resources in the location.	3.00	0.492		
29. Local public policy is friendly to SMEs and venture industry.	2.97	0.460		
Group VI Financial considerations:				
30. I require a return equal to at least 10 times my investment within 5-10 years.	3.24	0.606	3.42	0.79
31. I require an investment that can be easily made liquid (e.g., taken public or acquired).	2.94	0.422	3.17	0.89
32. I require a return equal to at least 10 times my investment within at least 5 years.	2.76	0.431	2.34	0.81
33. I will not be expected to make subsequent investments.	1.94	0.600	1.34	0.52
34. I will not participate in latter rounds of investment.	1.24	0.606	1.20	0.45

35. It is easy to find further investors or bank loans for the project.	2.38	0.511		
Group VII Characteristics of management team:				
Please score 1 for the single item below that you suggest the most essential one for the venture to go forward.				
36. The project is initiated by one person and he/she has relevant experience to the idea.	5.9%		20%	
37. The project is initiated by more than one person, each having similar relevant experience.	8.8%		9%	
38. The venture is initiated by more than one person, the individuals constituting a functionally balanced management team.	58.8%		42%	
39. None of the above factors are essential for the venture to go forward.	26.5%		28%	

Table 7.2 Screening Criteria Seen as Important by VCs in China, US, Singapore, Europe and Asia-Pacific Countries

	CHINA	US	SINGA- PORE	ASIA- PACIFIC	EUROPE	CANADA
Characteristics of the entrepreneur:						
1. The entrepreneur is honest enough.	3.68	N/A	N/A	N/A	N/A	N/A
2. The entrepreneur is capable of sustained intense effort.	3.65	3.60	3.58	3.74	3.55	3.56
3. The entrepreneur is able to evaluate and react to risk well.	3.35	3.34	3.52	3.45	3.57	3.31
4. The entrepreneur articulates in discussing venture.	(2.88)	3.11	2.61	2.77	2.77	2.74
5. The entrepreneur has rich social network.	3.03	N/A	N/A	N/A	N/A	N/A
6. The entrepreneur is thoroughly familiar with the market targeted by the project.	3.74	3.58	3.61	3.57	3.54	3.68
7. The entrepreneur has demonstrated leadership ability in past.	3.21	3.41	3.52	2.98	3.18	3.01
8. The entrepreneur has a track record relevant to venture.	2.91	3.24	3.39	2.92	3.03	2.68
Characteristics of the product/service and market:						
9. The product is proprietary or can otherwise be protected.	2.94	3.11	2.94	2.64	2.74	2.28
10. The product enjoys demonstrated market acceptance.	3.26	2.45	3.10	2.81	2.85	2.66
11. The product has been developed to the point of a functioning prototype.	2.18	2.38	2.94	2.92	2.97	3.05
12. The target market enjoys a significant growth rate.	3.71	3.34	3.35	3.15	3.00	2.86
13. The market size is scalable.	3.18	N/A	N/A	N/A	N/A	N/A

Geographic considerations:						
14. It is easy to access needed human resources in the location.	3.00	N/A	N/A	N/A	N/A	N/A
15. Local public policy is friendly to SMEs and venture industry.	2.97	N/A	N/A	N/A	N/A	N/A
Financial considerations:						
16. I require a return equal to at least 10 times my investment within 5-10 years.	3.24	3.42	2.84	2.94	2.86	2.56
17. I require an investment that can be easily made liquid (e.g., taken public or acquired).	2.94	3.17	3.00	2.67	2.72	2.39

Table 7.3 Project Screening Criteria Used by Different Types of VCFs in China

	ALL		LPVCFS		LCVCFS	
	Mean	SD	Mean	SD	Mean	SD
Group I: Entrepreneur's personality---the entrepreneur:						
1. is honest enough.	3.68	0.475	3.79	0.419	3.53	0.516
2. is capable of sustained intense effort.	3.65	0.485	3.74	0.452	3.53	0.516
3. is able to evaluate and react to risk well.	3.35	0.544	3.37	0.597	3.33	0.488
4. articulates in discussing venture.	2.88	0.409	3.00	0.333	2.73	0.458
5. attends to detail.	2.38	0.551	2.47	0.513	2.27	0.594
6. has a personality compatible with mine.	1.97	0.870	2.42	0.692	1.40	0.737
7. has rich social network.	3.03	0.388	3.11	0.315	2.93	0.458
Group II: Entrepreneur's experience---The entrepreneur						
8. is thoroughly familiar with the market targeted by the project.	3.74	0.448	3.79	0.419	3.67	0.488
9. has demonstrated leadership ability in past.	3.21	0.410	3.05	0.405	3.07	0.258
10. has a track record relevant to venture.	2.91	0.514	2.89	0.567	2.93	0.458
11. was referred to me by a trustworthy source.	2.26	0.618	2.53	0.697	1.93	0.258
12. I am already familiar with the entrepreneur's reputation.	2.03	0.627	2.21	0.713	1.80	0.414
13. has overseas educational and working experience.	2.09	0.933	2.37	0.955	1.73	0.799
Group III Characteristics of the products or service						
14. The product is proprietary or can otherwise be protected.	2.94	0.629	2.89	0.658	3.00	0.655

15. The product enjoys demonstrated market acceptance.	3.26	0.511	3.26	0.562	3.27	0.458
16. The product has been developed to the point of a functioning prototype.	2.18	0.576	2.21	0.535	2.13	0.640
17. The product may be described as "high tech."	2.15	0.702	2.11	0.658	2.20	0.775
18. The product has great potentials for export.	2.03	0.460	1.95	0.524	2.13	0.352
19. The product or service is complimentary to our other portfolios.	2.09	0.621	2.26	0.653	1.87	0.516
Group IV Characteristics of the market.						
20. The target market enjoys a significant growth rate.	3.71	0.462	3.84	0.375	3.53	0.516
21. The venture will stimulate an existing market.	2.35	0.485	2.42	0.507	2.27	0.458
22. The venture is an industry with which I am familiar.	2.06	0.547	2.16	0.375	1.93	0.704
23. There is little threat of competition during the first three years.	2.82	0.387	2.95	0.229	2.67	0.488
24. The venture will create a new market.	1.94	0.489	1.95	0.405	1.93	0.594
25. The market size is scalable.	3.18	0.576	3.26	0.452	3.07	0.704
Group V Geographical considerations:						
26. The project is located in capital city or other major cities in China.	2.26	0.511	2.11	0.459	2.47	0.516
27. The project is located within 50 miles to my office.	1.24	0.431	1.21	0.419	1.27	0.458
28. It is easy to access needed human resources in the location.	3.00	0.492	3.05	0.315	2.93	0.704
29. Local public policy is friendly to SMEs and venture industry.	2.97	0.460	3.33	0.594	2.53	0.375
Group VI Financial considerations:						
30. I require a return equal to at least 10 times my investment within 5-10 years.	3.24	0.460	3.47	0.513	2.93	.594
31. I require an investment that can be easily made liquid (e.g., taken public or	2.94	0.422	3.05	0.229	2.80	.561

acquired).						
32. I require a return equal to at least 10 times my investment within at least 5 years.	2.76	0.431	2.89	0.315	2.60	.507
33. I will not be expected to make subsequent investments.	1.94	0.6	2	0.667	1.87	0.516
34. I will not participate in latter rounds of investment.	1.24	0.606	1.1	0.513	1.4	0.704
35. It is easy to find further investors or bank loans for the project.	2.97	0.511	3.11	0.315	2.8	0.561
Group VII Characteristics of management team.						
Please score 1 for the single item below that you suggest the most essential one for the venture to go forward.						
36. The project is initiated by one person and he/she has relevant experience to the idea.	5.8%		10.5%		0	
37. The project is initiated by more than one person, each having similar relevant experience.	8.8%		5.3%		13.3%	
38. The venture is initiated by more than one person, the individuals constituting a functionally balanced management team.	58.8%		57.9%		60%	
39. None of the above factors are essential for the venture to go forward.	26.5%		26.3%		33.3%	

7.5 Characteristics of Rejected Ventures in China

To gain more insights about the key concerns of venture capitalists, the ten criteria that were most frequently rated as essential are presented in Table 7.4. The interviewees were asked to mark the factors as essential when they would reject the project regardless of any other characteristics. This provides an opportunity to analyze the characteristics for the projects that are most likely rejected by VCs in China.

As shown in Table 7.4, four of the top ten criteria that were most commonly rated as essential have to do with the characteristics of the entrepreneur characteristics in China. Moreover, all four criteria related to the entrepreneur rank among the top five essential criteria: 73.5 per cent of the venture capitalists would reject the project if the entrepreneur were not thoroughly familiar with the targeted market, and 67.6 per cent would deny the project if the entrepreneur was not capable of sustained intense efforts. Additionally, 64.7 per cent of venture capitalists would not invest in the project if the entrepreneur was not honest. The importance of human capital aspects is also shown in venture capitalists' concerns about the management team. As shown in Table 7.5, about 60 per cent of the venture capitalists suggest that a functionally balanced management team is essential. The result is similar to evidence from the United States.

Four criteria related to the market and products are also listed in the top ten. Table 7.4 shows that 58.8 per cent of venture capitalists would reject a project if the targeted market did not have a significant growth rate. Other criteria related to the market and products included market acceptance of the products, the scale of the market, and the proprietary protection of the products. The financial return and public policies of the local governments also ranked in the top ten.

The distribution of the top ten screening criteria identified by the venture capitalists in China slightly differs from those in the United States. Criteria that rank high in the US, like the liquidity of the investment, the track record of the entrepreneur, and if the entrepreneur is capable of articulating the venture well, are not as heavily emphasized in China. Instead, the integrity of the entrepreneur, the public policies of the project location, and the scale of the market are listed among the top ten criteria in China.

The result indicates that under weak regulatory institutions, venture capitalists in China normally rely on the integrity of the entrepreneur to reduce potential agency problems and uncertainties. At the same time, many venture capitalists are attracted by the huge size of the market in China. Furthermore, public policies of local government may influence some venture capitalists' investment decisions. In general, the result is consistent with the findings from the unstructured interviews.

Table 7.4 Ten Screening Criteria most Frequently Rated by VCs in China

	Number	%
1. The entrepreneur is thoroughly familiar with the market targeted by the project.	25	73.5
2. The entrepreneur is capable of sustained intense effort.	23	67.6
3. The entrepreneur is honest enough.	22	64.7
4. The target market enjoys a significant growth rate.	20	58.8
5. The entrepreneur is able to evaluate and react to risk well.	13	38.2
6. I require a return equal to at least 10 times my investment within 5-10 years.	11	32.4
7. The product enjoys demonstrated market acceptance.	10	29.4
8. The market size is scalable.	9	26.5
9. The product is proprietary or can otherwise be protected.	6	17.6
10. Local public policy is friendly to SMEs and venture industry.	4	11.8

Table 7.5 VCs' Requirements on Venture Team Composition of in China

RESPONSES	NUMBER	PERCENTAGE
One person with relevant experience essential	2	5.9%
Team with similar experience essential	3	8.8%
Balanced team essential	20	58.8%
None essential	9	26.5%

This study separately looks at the distribution of criteria that are commonly rated as essential by LPVCFs and LCVCFs. As shown in Table 7.6 and Table 7.7, the results demonstrate that LPVCFs are more demanding, since the frequency of the criteria rated as essential by LPVCFs is higher. The total score of the essential criteria for the 19 LPVCFs is 94; averagely, five criteria are considered as

essential for each LPVCF. However, the total score of the essential criteria for 15 LCVCFs is 51, so the average number of essential criteria for LCVCFs is far less than 4.

For LPVCFs, the top ten factors frequently considered as essential are the same as those recognized by the overall sample, although the sequence differs. Over 84.2 per cent of LPVCFs state that they would deny the project if the targeted market did not enjoy high growth rate that shows the importance of the market in the view of venture capitalists in China. At the same time, the financial return requirement is among the top five criteria. The other three criteria are related to the entrepreneur characteristics.

As for LCVCFs, whether the local public policies are friendly to venture capital investment and entrepreneurship is not among the top ten criteria. However, whether the location of the project may provide enough human resources is considered as essential more frequently. At the same time, four criteria related to entrepreneur's characteristics rank among the top five. The growth rate of the market is ranked fifth among the top ten criteria.

This comparison again confirms that LPVCFs are much more profit-driven than LCVCFs. They are passionate about the huge market potential in China; about half see financial returns as the very essential screening criteria. However, for LCVCFs, concerns with financial returns rank last in the top ten screening criteria. Only 2 of 15 LCVCFs would reject the project if the predicted return is less than 10 times the investment in 5 to 10 years. In addition, LPVCFs show more concerns about the weak regulatory institutions in China and are more sensitive to public policies than LCVCFs. On the other hand, LCVCFs are more sensitive to the supply of human resources than their colleagues in LPVCFs. One interpretation for this result is that LCVCFs that are mainly backed by local governments or large corporations that retain strategic considerations when they undertake venture financing.

Table 7.6 Ten Criteria Frequently Rated as Essential by LPVCFs in China

	Number	Percentage
1. The target market enjoys a significant growth rate.	16	84.2%
2. The entrepreneur is thoroughly familiar with the market targeted by the project.	15	78.9%
3. The entrepreneur is honest enough.	15	78.9%
4. is capable of sustained intense effort.	14	73.7%
5. I require a return equal to at least 10 times my investment within 5-10 years.	9	47.4%
6. The entrepreneur is able to evaluate and react to risk well.	8	42.1%
7. The product enjoys demonstrated market acceptance.	6	31.6%
8. The market size is scalable.	5	26.3%
9. The product is proprietary or can otherwise be protected.	3	15.8%
10. Local public policy is friendly to SMEs and venture industry.	3	15.8%

Table 7.7 Ten Criteria Frequently Rated as Essential by LCVCFs in China

	Number	Percentage
1. The entrepreneur is familiar with the market targeted by the project.	10	66.67%
2. The entrepreneur is capable of sustained intense effort.	9	60%
3. The entrepreneur is honest enough.	7	46.67%
4. The entrepreneur is able to evaluate and react to risk well.	5	33.33%
5. The target market enjoys a significant growth rate.	4	26.67%
5. The product enjoys demonstrated market acceptance.	4	26.67%
5. The market size is scalable.	4	26.67%
8. The product is proprietary or can otherwise be protected.	3	20%
9. It is easy to access needed human resources in the location.	3	20%
10. I require a return equal to at least 10 times my investment within 5-10 years.	2	13.33%

7.6 Factor Analysis

Factor analysis is conducted to explore the general pattern of VCs' concerns during project screening in China. The researcher tries to find out what posteriori factors emerge and how far the factors match the priori categories chosen for the examination with the factor analysis. Because many criteria are not

considered important, only criteria with a mean score over 3.0 are included in the analysis. Overall, 11 screening criteria are examined.

As discussed in earlier sections, the ex-ante project screening is considered an important mechanism used by venture capitalists to control uncertainty and risks that are associated with financing young and R&D-oriented companies. These factors are therefore classified into categories with the theme of risk control. The method of interpretation is similar to Tyebjee and Bruno (1981) and MacMillan et al. (1985).

Table 7.8 presents the result of the factor analysis. In total, four factors are extracted from the factor analysis using a cut-off of 0.5. The cut off point of 0.5 is chosen that is similar to that of the existing literature (MacMillan et, al., 1985) in order to make this study comparable.

As shown in Table 7.8, factor 1 is mainly associated with moral hazard issues of the entrepreneur. An entrepreneur who is honest and able to exert sustainable efforts is relatively insulated from opportunistic activities.

Factor 2 shows the concern from venture capitalists about the management risks of the entrepreneur. Entrepreneurs with rich social networks and those who have shown leadership in the past are more likely avoid management failure.

Factor 3 reports a concern for risk of loss. Projects that enjoy a scalable and high growth market and have the potential to produce more than 10 times payback within 5 to 10 years reduce the probability of losing the total investment.

Factor 4 reflects a concern for market uncertainty. This criterion stands out from other market and product characteristics and remains a single item factor in this analysis. It suggests that venture capitalists in China heavily emphasize demonstrated market acceptance. No matter how large the market and how high the growth rate, if the project does not show demonstrated market acceptance, then it may fail due to uncertainty.

In general, the result of the factor analysis is consistent with the findings from the unstructured interviews and the priori categories chosen for the questionnaire survey in the semi-structured interviews. It confirms that moral hazard issues are emphasized most by venture capitalists in China. VCs in China also see social networks as a considerably important element that may affect

overall management. The result echoes the findings from the unstructured interviews, which suggest that the weak regulatory and normative institutions are the major reasons for the strong emphasis on integrity and social networks of the entrepreneur (see 7.3). Venture capitalists rely more on the self-discipline and social networks of the entrepreneur when the legal system is underdeveloped in China. In this sense, *Guanxi* provides a complement to the contract law (Luo, 2002; Johnston, 1997). Moreover, the market is seen as one of the most attractive aspects. Venture capitalists are most sensitive to the uncertainty of the market, suggesting that the dynamics of the market may affect heavily venture capitalists' investment decisions.

The results of this factor analysis share both commonalities and differences from what has been found in the United States. Similar to their peers in the United States, venture capitalists in China also consider management risk, risk of loss, and market uncertainty as important risk factors. However, differing from the findings of Tybjee and Bruno (1981) and MacMillan et al. (1985), the present study does not find a clear pattern on venture capitalists' concerns with competitive risk and bail out risk.

Table 7.8 Factor Analysis of VCs' Project Screening Criteria in China

The screening criteria employed by VCs in China	Factor			
	1	2	3	4
The entrepreneur is capable of sustained intense effort	0.71	0.09	0.07	-0.08
The entrepreneur is honest enough.	0.95	-0.23	0.13	-0.03
The entrepreneur has rich social network.	0.21	0.85	0.09	0.20
The entrepreneur is thoroughly familiar with the market targeted by the project.	0.38	-0.09	-0.13	.084
The entrepreneur is thoroughly familiar with the market targeted by the project.	0.36	0.28	-0.55	-0.10
The entrepreneur has demonstrated leadership ability in past.	-0.13	0.55	-0.01	-0.18
The product enjoys demonstrated market acceptance.	-0.01	-0.10	-0.05	.955
The target market enjoys a significant growth rate.	0.07	0.02	0.50	-0.14
The market size is scalable.	-.138	0.13	0.58	-0.03
I require a return equal to at least 10 times my investment within 5-10 years.	0.25	0.15	0.55	0.12
It is easy to access needed human resources in the location.	-0.12	0.43	0.07	-0.07
% of variance	16.72	13.40	10.84	9.35

7.7 Conclusion and Implications

Combining the unstructured interviews and semi-structured interviews with 37 venture capitalists from 34 VCFs, this study provides an exploratory analysis on VCs' project screening criteria in China. VCs in China display both similarities and differences in project screening criteria with their peers in the United States. However, the analysis suggests that institutions, especially regulatory institutions, have a strong impact on VCs' project screening strategy in China.

Primarily, VCs in China share many commonalities with their peers in the United States and other developed countries in project screening criteria. All criteria that are recognized by VCs in the United States are also identified by VCs in China. In addition, VCs in China also consider the characteristics of the entrepreneur as the most important factor in their ex-ante project screening that is the same to the US practice. Moreover, similar to their counterparts in the United

Sates, VCs in China consider the market aspects of the products and services as critically important.

However, the analysis shows that the project screening criteria employed by VCs in China indeed unique in some aspects due to the institutional environments and arrangements in China. Above all, VCs in China are more demanding than their peers in the United States and other developed countries in project screening under the weak regulatory institutions. Most of the additional screening criteria are taken as compensations or complementary conditions to reduce the problems of weak regulatory institutions. For example, besides the commonly recognized screening criteria in the West, VCs in China place great emphasis on the honesty and social networks of the entrepreneur. These concerns about the honesty and social networks of the entrepreneur confirm the influence of the institutions. Venture capitalists have to rely on the self-discipline of the entrepreneur to overcome the lack of legal protection for institutional financiers and the weak law enforcement. Moreover, *Guanxi* may work as a complement to the contract law or serve as a kind of a surrogate market system due to ill-defined property rights, economic roles, and a restricted flow of information (Johnston, 1997).

Additionally, VCs in China pay much more attention to the geographical location of the projects due to the concerns about the public policies of local governments and the supply of human resources in different areas. This indicates that the decentralization of China's governance and the great regional diversity in China have significant impacts on VCs' investment activities.

Furthermore, this study also suggests that the macroeconomic environment is seen as a major concern by venture capitalists in China. VCs in China pay more attention to the market aspects of the projects in ex-ante screening than their peers in the United States and other countries. In particular, the market size and the market acceptance of the products are especially emphasized that suggests that the large market is the particularly seen as an attraction for VCs to invest in China.

Finally, consistent with the findings in the previous chapter, venture capitalists' choices in screening criteria are associated with the governance structure of the VCFs. This chapter provides evidence that LPVCFs, which are

more risk-taking, are also more demanding in project screening than LCVCFs, which are more risk-moderate. Moreover, LPVCFs are more profit-driven by nature and are much more sensitive to the market growth rate and financial returns of the projects in project screening than LCVCFs. Additionally, LPVCFs which are all foreign VCFs, care more about the regulatory institutions than LCVCFs in China. These observations suggest that the regulatory institutions affect the corporate governance of the VCFs in China and in turn influence VCs' investment screening strategy of in China. The result can be explained by the incentive schemes provided by different types of VCFs.

Perhaps the most important contribution of this study is that it provides the first analysis focusing on VCs' project screening criteria in China. It combines both qualitative and quantitative data to make it comparable to the existing literature without losing China's unique elements. This study also contributes to the existing literature on institution by improving understanding of how institutions impact the ex-ante screening activities of VCs in China.

By providing stylized facts on what VCs see as attractive factors and disadvantages in investment in China, this study may also have implications to policy-making. As discussed, most of the institutional impacts are mainly related to the legal system and public policies. It therefore provides an opportunity for policymakers to adjust the existing regulations accordingly if they want to promote venture capital industry. Finally, this study may also be helpful for practitioners. For entrepreneurs, who are seeking for venture capital investment, this study may provides sufficient knowledge on what VCs normally concern the most in project screening in China. They may therefore draft the business proposal accordingly with the emphasis on the key points. As for venture capitalists in this market or, those who wish to enter into this market, this study offers information on how their potential competitors view China's venture capital market and the risks and advantages related to this market.

Chapter 8 Venture Capitalists' Ex-post Monitoring and Stage Financing Strategies in China

8.1 Introduction

This chapter examines venture capitalists' stage financing to explore VCs' ex-post monitoring activities in China through the lens of stage financing arrangements. It examines the relationship between the characteristics of the venture capital back projects and VCs' ex-post monitoring activities; and, the relationship between the corporate governance structure of VCFs and VCs' ex-post monitoring efforts. By comparing the stage financing arrangements in China with those in the US, and, the stage financing activities employed by different groups of VCFs in China, this study tries to determine whether and how institutions impact VCs' stage financing. Questions like how venture capitalists structure stage financing and the major reasons and motives for them to make these arrangements in China are addressed.

Stage financing is deployed widely by venture capitalists. It has been recognized as one of the most effective ways to deal with agency problems in venture financing. By staging capital infusion, venture capitalists monitor and evaluate projects periodically and provide funds in instalments according to project performance. In this way, they retain the option to abandon the venture if the pre-set milestones are not achieved or the venture shows any negative signals.

Theorists suggest that venture capitalists mitigate uncertainties and risks derived from information asymmetries and lack of collateral by staging the capital infusion, because the refinance decision is made with more information revealed and more human capital transferred into physical assets (Neher, 1999; Wang, 2002). In addition, the threat of abandoning the venture also eases agency problems and provides incentives to entrepreneurs to exert more effort in order to meet goals and deter entrepreneurs of bad projects from seeking capital (Cornelli and Yosha, 2002; Huang and Xu, 1998).

Even though the impact of stage financing has been discussed extensively by theorists, the topic has received little empirical investigation except for Salmán (1990), Gompers (1995) and Kaplan and Per Stromberg (2003, 2004). Based on the US data, the authors show the relationship between the stage

financing arrangements and the severity of agency costs and other external risks associated with the venture capital backed companies. The findings are consistent with most theories of stage financing, which indicate that stage financing allows venture capitalists to gather information, monitor the progress of their portfolio companies, and keep the option to abandon the bad projects.

Two major limitations are associated with the current studies. First, the existing literature solely focuses on agency issues of venture capital backed companies and the structure of stage financing. None of these studies examine how incentive schemes provided by venture capital funds impact stage financing arrangements. Second, the empirical evidence is based on examinations in the US market, where institutional environments for business activities are among the best and the governance structures are more homogeneous (e.g. over 80 per cent of venture capital institutions in the United States are structured as limited partnerships). Stage financing outside the US under other institutions are not well documented.

This chapter explores how institutions impact venture capitalists' investment behaviour in China. The existing literature suggests that venture capitalists assess potential agency problems and external risks to decide whether to stage capital infusion and how frequently to monitor the progress of their portfolios. Therefore, more agency problems and transaction costs should lead to shorter financing, more financing rounds, and smaller investment. Transaction cost economics suggests that different incentive schemes provided by venture capital funds may also influence venture capitalists' investment activities. A relatively independent governance structure with a more pay-for-performance incentive scheme may provide more incentives for frequent ex-post monitoring activities, i.e. shorter financing duration and more financing rounds. However, a more hierarchical organizational structure with a more fixed payment incentive scheme may lead to less exertion of venture capitalists' efforts in staging the capital infusion.

The analysis of 436 venture capital backed companies in China confirms the predictions derived from the in-depth interviews, agency theory, and transaction cost economics. In addition to the agency problems and uncertainties

associated with the venture capital backed deals, the incentive schemes provided by venture capital funds also impact the choice and structure of stage financing in China.

The results show that VCFs under limited partnership employ stage financing much more frequently and show clear regularities in their stage financing arrangements. However, VCFs under the limited company structure rarely employ stage financing. Moreover, they do not show visible regularities in the choice and structure of stage financing in their investment. This illustrates the double-sided moral hazard problem that the incentive schemes provided by venture capital funds are important to encourage venture capitalists to exert efforts in venture financing (Cassammata, 2003; Repullo and Suarez, 2004).

Moreover, this study shows that stage financing strategy deployed by VCFs under limited partnership in China is closely related to agency problems and transaction uncertainties. The more the serious the expected agency problems, the more intensive stage financing that is used. Financing duration between stages is negatively and significantly correlated with R&D intensity but positively and significantly correlated with the age of the company backed by venture capitalists. Moreover, a higher ratio of intangible assets and R&D spending in new product development leads to more rounds of funding. Furthermore, venture capitalists' stage financing is closely related to the performance of portfolio companies. Companies that have gone public received significantly more rounds of venture funding and total venture capital than those that are privately held. This result implies the positive impact of stage financing on terminating bad projects and reducing agency costs. It is also interesting to note that the VCFs structured as limited partnerships in China have similar stage financing behaviours to their counterparts in the US (Gompers, 1995; Kaplan and Per Stromberg, 2003); however, VCFs structured as limited companies in China are substantially different in stage financing from either the VCFs under limited partnerships in China or those in the United States.

This chapter proceeds as follows. Section 2 presents the qualitative findings on venture capitalists' stage financing in China from the fieldwork. Section 3 clarifies the research questions for the quantitative analysis based on the

exploratory findings from the interviews and the existing literature. Section 4 describes the data and provides descriptive statistics of the quantitative data. Section 5 demonstrates the findings from quantitative analysis and discussion. The chapter concludes in Section 6.

8.2 Exploratory Findings on VCs' Stage Financing in China

8.2.1 Stage Financing and Monitoring Costs

All the VCs interviewed considered stage financing as an important way to control uncertainties and risks. Normally, there are two types of stage financing, i.e. ex-ante stage financing and ex-post stage financing arrangements. In an ex-ante stage financing deal, VCs design a contingent contract with entrepreneurs for follow-up financing rounds upon financial or non-financial milestones. Sometimes, however, some venture financings are not explicitly staged ex-ante; rather, they are implicitly staged ex-post (Kaplan and Per Stromberg, 2003). Both ex-ante and ex-post staging arrangements were emphasized by VCs in the unstructured interviews.

The semi-structured interviews provide further evidence for the findings from unstructured interviews with the answers from VCs on their actual investment activities in China. As shown in Table 8.1, 27 of 34 VCFs once used ex-ante staging contracts in their investment in China. More than 94 per cent of the venture capitalists interviewed stated that they would like to consider ex-post staging if the portfolio company does well and have great potential.

However, VCFs under different governance structure have different choices in stage financing. As shown Table 8.1, VCFs under limited partnership make ex-ante staging arrangements much more often than VCFs structured as limited companies. Over 89 per cent of the LPVCFs once employed ex-ante stage financing in China compared to a 66 per cent of LCVCFs. Additionally, over 49 per cent of the LPVCF backed deals were designed with ex-ante staging contracts whereas less than 18 percent of LCVCF backed deals were designed with a contingent contracts on further financing rounds. But interestingly, there is not much difference between these two types of VCFs in their views on ex-post stage financing.

Table 8.1 Choice of Stage Financing by the 34 VCFs in China

	ALL VCFS (#)	LPVCFS (#)	LCVCFS (#)
Q1: Whether you have ever invested the capital by instalments?			
Yes	74.47% (26)	89.47% (17)	66.67% (10)
No	23.53% (8)	11.53% (2)	33.33% (5)
Q2: What is the ratio of the ex-ante staging arrangements in your investments in China?			
	35.21%	49.16%	17.55%
Q3: Would you consider funding next rounds if you see great potentials from the company?			
Yes	94.11% (32)	94.74%(18)	93.33%(14)
No	5.89%(2)	5.26%(1)	6.67%(1)

In addition, the interviews with VCs show that, similar to their counterparts in the United States, VCs in China make many efforts on management of their portfolio companies. As shown in Table 8.2, over 73 per cent VCs normally check the financial report of their portfolio companies monthly. In addition, over 44 per cent VCs visit or talk to entrepreneurs or management teams for more than three times a week.

Moreover, the interviews show that VCs make even more efforts to communicate with entrepreneurs and evaluate the performance of portfolio companies before deciding to make further investments. In general, over 73 per cent VCs would visit or talk to the entrepreneurs or management teams of their portfolio companies for more than three time a week before a decision for the next round of financing that the ratio is substantially increased than usual. This finding is consistent with the findings in the United States (Sahlman, 1990). The extra efforts are also echoed by the conversation with VCs. As one FVC said, *'Yes, it [decision-making for next round of financing] costs a lot of time and money, we have to meet them [entrepreneur and management team] many times, audit the financial information, investigate the market and so on. And, we also need to set meetings with other partners of the fund to have their opinions...it's really consuming, but worthwhile of course...'* (Info: VCF18).

More interestingly, the interviews also show the ex-post efforts made by VCs from different types of venture capital firms are different. VCs from limited partnerships normally communicate with management teams much more frequently than VCs from limited companies in general and before refinancing. As

shown, over 94 per cent VCFs under limited partnership require portfolio companies to provide financial reports monthly compared to less than 47 per cent LCVCFs. At the same time, over 63 per cent VCs from limited partnership visit or talk to the entrepreneurs at least once a week compared to 20 per cent VCs from limited companies. Consistently, over 94 per cent VCs from limited partnership communicate with their investees for more than three times a week before the decision for the next round financing compared to less than 47 per cent VCs from limited companies.

Table 8.2 VCs' Management of the Portfolio Companies

	ALL VCFS (#)	LPVCFS (#)	LCVCFS (#)
Q4: How often you talk to/visit the entrepreneurs/management teams?			
More than three times a week	44.11% (15)	63.16% (12)	20% (3)
Once a week	47.06% (16)	36.84% (7)	60% (9)
Once two weeks	8.83% (3)		20% (3)
Q5: How often you need the portfolio company to provide their financial reports?			
Monthly	73.53% (25)	94.74% (18)	46.67% (7)
Seasonally	14.71% (5)		33.33% (5)
Randomly	11.76% (4)	5.26% (1)	20% (3)
Q6: How often you talk to/visit the entrepreneurs/management teams in the two months before you make the refinancing decision?			
More than three times a week	73.53% (25)	94.74% (18)	46.67% (7)
Once a week	26.47% (9)	5.26% (1)	53.33% (8)

Overall, the interviews show that, similar to the US practice, stage financing is also widely employed by venture capitalists in China. At the same time, like their counterparts in the United States, VCs in China suggest that extra efforts are needed for stage financing arrangements. However, according to the interviews, LPVCFs and LCVCFs differ from each other stage financing arrangements. LPVCFs stage the capital infusion much more frequently in than LPVCFs in reality. In addition, the efforts exerted by LPVCFs for ex-post monitoring are more than those made by LPVCFs in general and, before the decision for next financing rounds in particular.

8.2.2 Major Reasons for Staging Capital Infusion in China

8.2.2.1 Termination of bad projects

When being asked why they pay extra costs to arrange stage financing, nearly all venture capitalists specify terminating unsuccessful projects on time as

the primary reason. Investing in young and usually high-technology companies without collateral, venture capitalists face severe agency problems as well as external risks and uncertainties. Therefore, they see the option of abandoning an unsuccessful venture as a critical way to protect their own interests. As one FVC stated, *'No, we don't put all the needed capital upfront. As you know, we don't require collateral, so, if there is anything goes wrong, we normally lose all. But, no one can guarantee hundred percentages in business, so many uncertainties, market, people, products, competitions and industrial policies, etc. So, we must avoid the loss as much as possible...'* (Info: VCF2)

Although venture capitalists do not always arrange explicit ex-ante staging contracts, they try to arrange ex-post staging arrangements to avoid large amount of loss. As one DVC suggested, *'We usually don't sign staging contracts. We may consider further funding if they do well, but we never promise. Actually, we normally invest moderate amount of funds first and the decision on next round financing depends on their performance.'* (Info VCF20).

Venture capitalists also emphasize that investing in instalments is especially critical in China, where investor protection is still weak, law enforcement is problematic, and entrepreneurs are inexperienced. One FVC describes giving up a project due to a change of industrial policies in digital media in China: *'We were lucky in that case. It was a sounded project, and the company has begun to make profits before we joined in. They needed more funds to expand the market. But, the State Administration of Radio, Film and Television released a regulation on restricting the coverage of digital media afterwards that substantially influenced the business of the company. So, we had to withdraw the next instalment. We would have lost at least 8 million dollars. But we only paid \$1 million for the first instalment. So, we did not lose too much anyway...'* (Info: VCF33). The importance of terminating bad projects is further echoed by another FVC: *'In this circle, choosing a smart project is more like luck, but knowing when and how to stop a bad project is always wisdom'* (Info: VCF16).

The semi-structured interviews confirm the findings of the unstructured interviews that terminating bad projects is an important reason for venture capitalist to stage capital infusion. In many cases, pre-set milestones are not

achieved. As shown in Table 8.3, only one venture capitalist said that all of their portfolio companies had achieved their pre-set milestones. Overall, the average ratio of the companies that have satisfied the performance milestones is only 31.38 per cent. The average ratio of the companies that fulfilled the milestones backed by LPVCFs was five per cent higher than those backed by the LCVCFs. The results show that even though VCs put forth many efforts into ex-ante screening and due diligence, the uncertainties and risks are difficult to predict and to avoid. Therefore, an efficient mechanism for terminating unsuccessful projects seems to be more very important.

Table 8.3 The Average Ratio of Companies that can Achieve the Milestones

Q8: WHAT IS THE AVERAGE RATIO OF PORTFOLIO COMPANIES THAT CAN ACHIEVE THE MILESTONES?			
	ALL	LPVCFs	LCVCFs
portfolio companies that can achieve milestones	31.03%	33.26%	28.20%

Being asked what kind of decisions they have made when the performance milestones were not achieved, all the 27 responded VCFs stated that they once terminated the funding as shown in Table 8.4. At the same time, over 81 per cent VCFs once chose to provide future funding under the conditions that were set in the original contingent contracts. In most cases, these conditions included increasing venture capitalists' control rights, increasing venture capitalists' share, or reducing the management team's option. Only 11.54 per cent VCFs once provided the exact amount of further funding as stated in the original contract.

Again, there were differences between LPVCFs and LCVCFs. Over 94 LPVCFs once enforced the contingent contracts, while only 55.56 per cent LCVCFs took the same actions. In addition, less than 5.56 per cent LPVCFs once provided additional funding compared to 33.33 per cent LCVCFs.

Overall, the interviews show that in most cases, the portfolio companies are not able to achieve the pre-set milestones. The interviews show that, similar to their counterparts in the United States, VCs in China also consider stage financing as an important way to terminate bad projects. However, the results demonstrate that LPVCFs and LCVCFs are different in the way to deal with the unsatisfied projects: LPVCFs normally undertake tougher punishments for the unsatisfied projects than LCVCFs do. If the stage financing indeed helps VCs to terminate

bad projects, it is expected that companies with better performance should gain more financing rounds and overall investment.

Table 8.4VCs' Solutions when the Milestones are not Achieved

Q10: HAVE YOU EVER MADE THE FOLLOWING DECISIONS IF THE MILESTONES ARE NOT ACHIEVED?			
	All (#)	LPVCFs (#)	LCVCFs(#)
Terminating further funding	100%(27)	100% (18)	100% (9)
Providing the funding under the conditions of contingent contract	81.48% (22)	94.44%(17)	55.56% (5)
Postpone the decisions on further funding	22.22% (6)	15.79% (3)	33.33%(3)
Providing further funding as stated in original contract	11.54% (4)	5.56% (1)	33.33% (3)
Looking for new investors for the company	18.52%(5)	15.79% (3)	25% (2)
Providing bank loan warrantee for the company	7.41% (2)	0 (0)	25% (2)

8.2.2.2 Reduction of agency problems

The second major reason for venture capitalists to employ stage financing is to solve potential agency problems due to information asymmetries. In some cases, entrepreneurs try to hide negative information and continue the projects. As a DVC pointed out, *'He [entrepreneur] has quit a nice job and paid almost all savings and time to the new business. So, he may try every best to continue [the project] even [though] he knows there are problems with the projects. But, we don't know. So we have to limit the investment size at [an] earlier stage and set up some hard measures to evaluate [their performance].'* (Info: VCF4).

Moreover, conflicts of interest between venture capitalists and entrepreneurs are more complicated in venture capital investment, which is mainly focused on financing young high-technology companies. Entrepreneurs' private interests, like investing in more risky projects to satisfy their own research interests or build up their personal reputation in research at the price of shareholders interests, are major concerns of venture capitalists. As a FVC mentioned, *'They are passionate on what they do. In fact, that is what attracts me. But sometimes they go too far. They are crazy about their own ideas in technological improvement. If you don't force them to face harder financial*

constraints, they may invest infinitely in the technological details and turn the company into a real lab at the end of the day' (Info: VCF19). Acknowledging the potential issues, most venture capitalists suggest that this kind of problem is hard to verify on time. One FVC further elaborated: *'what even more serious is you don't realize the dangers, so don't they [entrepreneurs]. Sometimes you get excited with their ideas too. A thorough re-evaluation is a nice chance to cool both us down. As a rule, we have to discuss with other partners before the payment of next round. It helps a lot.'* (Info: VCF12). The findings are consistent with most of the existing literature on control theory, which suggests the option to withdraw future funding is critical for investors who invest in projects with a higher level of risk and greater uncertainties (Aghion and Bolton, 1992; Bolton and Scharfstein, 1990).

Furthermore, venture capitalists in China also recognize the signalling and screening effects of staging contracts. Almost all venture capitalists expressed that pre-set milestones help them gain information about the potential of projects and screen out uncertain candidates. If the entrepreneur hesitates with stage financing, venture capitalists normally reconsider the deal. As one FVC said, *'Well, I receive over 200 business plans per year. If you look at the business plans, it seems that over half of the young guys will be Bill Gates. But, when we talk about stage financing, some become much more conservative...So, you get some sense about the real value while negotiating milestones and punishment terms.'* (Info: VCF23). A DVC further addressed: *'if they themselves are not confident in the milestones, how could we believe they can run [the company] well?'* (Info: VCF4).

According to the interviews, venture capitalists in China consider stage financing as an important way to reduce potential agency problems due to the severe informational asymmetries in venture financing. The initial findings from the interviews are consistent with most of the existing theoretical literature on stage financing and empirical evidence from the United States. However, a more objective analysis based on a larger sample is needed to facilitate the reliability and validity of the findings in from the in-depth interviews.

8.3 Hypotheses for the Quantitative Analysis

As stated in the earlier section, consistent with the existing literature, the interviews reveal that venture capitalists indeed consider stage financing as an important mechanism in their investments in China. The results suggest that agency problems should be associated with the stage financing arrangements in China. If there is no agency problem, venture capitalists give entrepreneurs as much capital as they need upfront, and stage financing is not necessary. Alternatively, if stage finance is not used as a mechanism to mitigate agency problems and uncertainties in China, then no relationship between stage finance and investment performance is observed.

The interviews also show that VCFs in China are divided by governance structure. The two different types of VCFs in China differ in terms of compensation schemes, decision-making process, and authorization systems, which may have great bearings in stage financing. The questions raised here are whether VCFs behave differently in stage financing and whether VCFs under limited partnership, which are all foreign VCFs, behave similarly to their counterparts in the United States; whereas LCVCFs under limited company structure, among which the majority are DVCFs, behave differently from VCFs under limited partnership in China and VCFs in the United States. In particular, this study explores whether stage financing is associated with agency problems and uncertainties and whether it is correlated with the performance of VC-backed companies.

To summarize, the following hypotheses are made: everything else being equal the more severe the agency problem is the more rounds of stage financing will be; better performed venture capital backed companies should be associated with more rounds of stage financing and with larger size of total venture investment; companies backed by LPVCFs may involve in more stage financing arrangements; and, the stage financing arrangements of LPVCFs and the performance of companies backed by LPVCFs are more sensitive to agency problems.

Poisson regression is used to estimate the number of financing rounds, since the variable is ordinal and non-negative. Focusing on the number of rounds of stages, the regression model is specified as follows:

$$\text{Log}(y_i) = \alpha + \delta IPO_i + \gamma MA_i + \beta' X_i + \phi LPVCF_i + \varepsilon_i \quad (1)$$

where i is the index for the i -th VC-backed firm; y is the number of financing rounds; α is a constant; dummy variable IPO equals one if the company went public, which implies a successful investment; dummy variable MA equals one if the company was acquired, which also implies a successful outcome; X is a vector of variables measuring agency costs and uncertainties (at the industry level) associated with firm i ; dummy variable $LPVCF$ equals one if the company was backed by a VCF under limited partnership structure; and ε_{it} is a random error.

Similarly, focusing on the size of total venture investments, the regression model is stated as:

$$z_i = \alpha + \delta IPO_i + \gamma MA_i + \beta' X_i + \phi LPVCF_i + \varepsilon_i \quad (2)$$

where z_i is the size of total venture investments to company i ; and all other variables are the same as model (1).

The following hypotheses are tested: Coefficients δ and γ should be positive and significantly larger than zero, i.e. more successful companies receive more rounds of stage financing and more total funds; coefficient β should be significantly different from zero, i.e. stage financing strategy is affected by the degree of uncertainty and the seriousness of agency problems; coefficient ϕ should be significantly different from zero, i.e. VCFs under different structure use stage financing differently.

In next step, the relation between agency problems and the intensity of stage financing (hereafter abbreviated as stage intensity) are examined in China. The duration between financing rounds measures the stage intensity. Stage financing requires extra effort and costs from venture capitalists. At the same time,

venture capital does not require collateral. Therefore, the capital invested may be completely sunk if the project fails. If venture capitalists take stage financing as an important means to control agency costs in China, they may have to balance the tradeoffs between the benefits and costs of stage financing intensity. It is thus expected that venture capitalists may shorten the duration between financing rounds and reduce the size of investment per financing round for companies that are associated with more severe agency problems. The development stage at the time of investment, age, R&D intensity, and intangibility of assets of the venture capital backed companies are included in this examination as measurements of agency costs. It is expected that the stage intensity is associated with corporate structure.

Liquidity constraints of the venture capital market are included in the examination. As financial intermediaries, VCFs may face liquidity constraints, and the shortage of capital may influence their refinancing activities in stage financing. In this sense, more capital raised in the previous year may induce more frequent and larger venture capital investment (Petersen and Rajan, 1995).

A survival analysis model, Cox regression, is used to estimate the duration between financing rounds, because the duration data is right-censored, i.e., the duration data can only be observed if the next financing rounds occurs; thus, the survival analysis focuses on the distribution of hazard rate to estimate the duration model. Cox Regression⁴⁴ is a semi-parametric survival analysis model that does not assume any particular distribution of survival time data. As such, Cox Regression is considered more robust than general parametric survival analysis

⁴⁴ Cox proportional-hazards regression model is a broadly applicable and the most widely used method of survival analysis. Cox (1972) proposed a semi-parametric proportional hazards model that can be used to model survival data without pre-specifying the distribution of the baseline hazard. This method is widely used and has been shown to be both robust and powerful. There are also some parametric proportional hazard models that assume that the survival times follow a given distribution. Under the correct baseline hazard distribution, parametric models are more powerful than the equivalent nonparametric or semi-parametric methods. However, when the true underlying distribution of the baseline hazard is unknown, Cox proportional hazards regression remains the method of choice for most simple survival analyses (Anderson, 2006). Moreno et al. (2005) compare the Weibull and Cox proportional hazards models to a more conventional QTL-mapping method that ignores the nature of the survival data and found that semi-parametric proportional hazards models have greater power.

models and can examine multiple factors and the association between those factors and survival time data. The duration regression model is addressed as follows:

$$\text{Log } h_i(t) = \delta \text{Early}_i + \gamma \text{Middle}_i + \boldsymbol{\beta}' \mathbf{X}_i + \chi \text{Age}_i + \eta \text{Cash}_i + \phi \text{Cap}_i + \phi \text{LPVCF}_i + \varepsilon_i \quad (3)$$

where i represents a venture capital backed deal; t is the time between financing rounds counted in year for deal i ; $h_i(t)$ is the hazard rate for deal i being financed for t years; dummy variable *Early* equals one if the company was in its early development stage when deal i occurred; dummy variable *Middle* equals one if the company was in its middle development stage when deal i happened; \mathbf{X} is a vector of variables measuring agency costs and uncertainties (at the industry level) associated with deal i ; *Age* is a variable measuring company specific agency problems and uncertainties associated with deal i ; *Cash* is a variable measuring liquidity constraints of venture capital market in the year when deal i happened; *Cap* is the investment size of deal i ; dummy variable *LPVCF* equals one if the company was backed by a VCF under limited partnership structure; and ε_{it} is a random error. The coefficients in regression (3) are estimated via maximum likelihood estimators. These coefficients estimate the probability that the firm receives financing in a particular month given the values of the independent variables.

Focusing on the size of venture investment per financing round, the regression model can be expressed as:

$$\text{Cap}_i = \alpha + \delta \text{Early}_i + \gamma \text{Middle}_i + \boldsymbol{\beta}' \mathbf{X}_i + \chi \text{Age}_i + \eta \text{Cash}_i + \phi \text{LPVCF}_i + \varepsilon_i \quad (4)$$

where *Cap* is the size of the venture investment involved in deal i and all other variables are the same as in model (3).

The following hypotheses are tested: Coefficients δ , γ and $\boldsymbol{\beta}$ should be negative and significant, while coefficient χ should be positive and significant, indicating that venture capitalists increase the stage intensity and reduce investment size per financing round for projects associated with more severe agency problems and uncertainties; η should be negative and significant in

regression (3) and positive and significant in regression (4), illustrating that venture capitalists shorten the financing duration and invest more per financing round when the liquidity constraints are reduced; and coefficient ϕ should be significantly different from zero to show that VCFs use stage financing differently.

As expected, the VCFs under the two governance structures behave differently, so their stage financing strategies are discussed separately. The corporate structure and the compensation schemes provided by LPVCFs in China are similar to those of VCFs in the US under the same governance structure, but LCVCFs in China differ substantially. Differences are also shown in their stage financing arrangements. According to the interviews, LPVCFs arrange stage financing more frequently LCVCFs do in China. In addition, the LPVCFs terminate projects with negative signals more often. The qualitative findings suggest that LPVCFs exert more effort in ex-post monitoring activities, which is consistent with organizational theories. Researchers argue that more decentralized organizations provide stronger incentives for exploiting profit opportunities and actors are quick to adapt to changing circumstances as information is revealed through market prices (Milgrom and Robert, 1992; Holmstrom, 1992; Shleifer, 1985). Compared with decentralized structures, however, centralized organizations provide managers with weaker incentives to maximize profits and normally incur additional bureaucratic costs (Milgrom and Roberts, 1990). In the case of venture capital in China, VCFs under limited partnership provide high-powered incentives associated with unlimited liability, whereas VCFs under the limited company structure provide lower-powered incentives associated with limited liability to their investment professionals.

If the qualitative findings can be generalized and the arguments concerning governance structure and incentives represent reality in China, then venture capitalists from LPVCFs should be more sensitive to agency problems and should exert more effort to improve profits in venture investments. In the case of stage financing, if stage financing is indeed an effective way to reduce agency costs and uncertainties in China, it is expected that the relationship among stage financing, performance, and agency costs should be more visible with LPVCF backed companies than that with LCVCF backed companies in China.

The following questions are addressed. First, for FVCFs under the same corporate governance structure (i.e. limited partnership), as their counterparts in the US, a natural experiment is conducted to investigate whether their location of operation makes a difference in their stage financing strategy. Second, for VCFs under different corporate governance structures, another natural experiment is conducted to explore whether different corporate structures cause VCFs to behave differently in stage financing. So, the same regression analyses as in the previous chapter are executed, excluding the dummy variable on corporate governance, for the two different groups of VCFs.

8.4 Quantitative Analysis Data

8.4.1 Data Sources

A sample of 436 VC backed companies was randomly selected from a database of 640 companies. All of these companies received venture capital investment between 1990 and 2006, and their first round of financing occurred prior to January 2005. The database was composed with two sub-datasets: the Venture Economics Database⁴⁵ and a hand-collected database based on the interviews and archive analysis.⁴⁶

The two sub-datasets provide detailed investment information concerning venture capital backed companies. Each sub-dataset includes the name of the company; industry (in four digits); establishment data; current public status (e.g. public, private or acquired); total amount of venture investment gained; number of rounds of venture financing; dates of each venture financing round; amount of venture financing in each round; stage of the company at the time of each venture financing round; date of IPO, if relevant; name of the venture capital investors per round; and the nation of each investor.

⁴⁵ This database contains information on over 200,000 private equity investments (one whole financing round consists of several single investments) and is widely recognized as a leading source of venture capital investment data. Currently, it has gathered investment information on over 530 venture capital deals in China. Moreover, this dataset has been used widely in previous venture capital research (e.g. Bygrave, 1989; Lerner, 1994; Gompers, 1995; Gompers and Lerner, 1999a; Kortum and Lerner, 2000).

⁴⁶ The hand-collected data were mainly gathered from our interviews with VCs conducted from 2004 to 2006 and from the websites of VCFs.

Information on development stage and public status of the companies outside of the Venture Economics' Database was mainly gathered from the interviews, mass media, and the websites of the companies if available. Unlike news on issuing IPO, however, sometimes news on Merger and Acquisition (M & A) is not open to the public; thus, data on M&A might be underestimated. Furthermore, companies without information on IPO or M&A are considered privately held. The number of privately held companies may be overestimated, since it is possible that some companies have been bankrupted or merged and acquired, although their websites are still running; this could not be distinguished due to lack of accurate information. Therefore, the companies' current public status is classified into three categories rather than four as in Gompers' (1995) study.

The intangible asset to total asset ratio is important information in the analysis. However, the financial data of venture capital backed companies are not available. It is thus assumed that for any given industry and any given year, the average ratio for venture capital back companies is the same as that the national average (Gompers, 1995). The national average ratio for each industry in every year is calculated from the Chinese industrial firm census data. A similar assumption is made for the R&D spending to value added ratio and the R&D spending in new products developments to value added ratio, which were obtained from China's High-Tech Industry Statistics.⁴⁷ The data were matched by year and industry to each company and each round of financing as in Gompers' (1995) study.

Aggregate data on venture capital industry in China were collected from the China Venture Capital Yearbook 2003, published by China National Democratic Construction Press, and the Annual Report on Venture Capital In China (2002–2006) published by Zero2IPO Co., Ltd. The data include aggregate information on total venture capital funds under management, new capital funds raised, and the amount of venture capital invested in each year.

⁴⁷ The data were on an aggregate level that only information technology, semi-conductor, electronic, medical care and biotech could be collected. This might influence the results, although most of our samples are in these industries.

8.4.2 Definition and Measurement of Variables

8.4.2.1 Dependent Variables: Ex-post monitoring activities and financing size

1. Intensity of VCs' stage financing: Intensity of venture capitalists' stage financing activities is measured by the duration between financing rounds (Gompers, 1995; Kaplan and Per Stromberg, 2003; 2004). In this study, intensity is measured by time in years from funding date to the next funding dates for the venture capital backed deals. The shorter duration between funding rounds indicates a more intensive stage financing arrangement. Venture capitalists must exert extra effort in stage financing, therefore, the more frequently that venture capitalists make refinancing decisions, the more monitoring efforts that are exerted.

2. Volume of VCs' stage financing efforts: The efforts exerted by venture capitalists to monitor a company in stage financing are measured by the total number of financing rounds gained by the company. They must re-evaluate portfolio companies periodically and terminate unsuccessful projects. If monitoring activities work in this way, then a company with better performance should be associated with more financing rounds.

3. Risk of loss: Risk of loss is measured by the investment size per financing round. Since collateral is usually not required in venture capital investment, capital can be completely lost if the project fails. Thus, the larger the size of investment per financing round, the greater the risk of loss for the investment is.

4. The value of information revealed: The size of total investment in stage financing is taken as a measurement of the value of the information. Researchers suggest that a positive relationship between a well-performing company and the level of investment should not be obvious, unless the venture capital firm uses information during stage financing (Gompers, 1995; Conelli and Yosha, 2003). In this sense, the greater the amount of the total investment involved in a successful VC-backed company during stage financing, the higher the value of the information.

8.4.2.2 Independent Variables

1. Agency problems associated with venture capital backed companies

a. Liquidation value of assets: Liquidation value of assets is measured by the portion of intangible assets that the company possesses (Williamson 1988). A

larger portion of intangible assets indicates higher expected agency costs. The industry average ratio of intangible assets to total assets is taken as a proxy of the liquidation value of the company.

b. Asset specificity: Asset specificity is measured by the intensity of R&D (Riordan and Williamson 1985; Shleifer and Vishny 1992). Less asset specificity decreases expected agency costs. Industry average ratio of R&D spending to value added and the ratio of R&D spending in new product developments to value added are taken in this study as proxies for the R&D intensity.

c. History of the company: The history of the company is measured by the age of the company at the time of venture financing. A company that has a longer history is able to provide more information to investors, so venture capitalists can better judge their prospects. Agency costs and information problems should be lower for these firms (Gompers, 1995).

d. Development stage of the company: The development stage is self-reported by the company at the time of venture financing. Normally, development stage is categorized into early stages (seed/start-up, first stage), expansion stages (expansion stage, second stage) and late stages (third stage, bridge, Buyout/acquisition, other late stages). Companies that are at early stages of development, such as the seed and start-up phases, provide less information to potential investors and encounter considerable management, market, and technological uncertainty (Gompers, 1995; Ruhnka and Young, 1987) that may cause more agency problems and other external risks. Therefore, expected agency costs and external risks should be reduced as firms move toward later stages.

2. Performance of VC-backed companies: Performance is measured by the outcomes of the venture capital backed companies, i.e. public status of the companies by March 2006. The status of the companies is classified into three categories: IPO, acquired, or privately held.⁴⁸ Studies show that divestments via IPO bring the highest returns to venture capitalists. Venture capitalists' that exit through the M&A of their portfolio companies show the second best returns (Gompers and Lerner, 1999a). Therefore, even though the measure is imprecise,

⁴⁸ Unlike Gompers (1995), this study does not consider bankruptcy as one of the categories, since there is almost no source to find out bankruptcy information in China.

the classification may give some indication of investment performance, as Gompers (1995) suggests.⁴⁹ Thus, companies that have issued IPO or have been acquired are considered more successful.

3. Governance structure of VCFs: Since accurate information on the governance structure of VCFs is not available, governance structure is proxied by the origin of the venture capital firm. FVCFs are proxied as VCFs under limited partnership, while DVCFs are proxied as VCFs under the limited company structure. VCFs under limited partnership, which is a more decentralized structure, should provide stronger incentives to venture capitalists. However, VCFs organized under the limited company structure, which is more hierarchical, provide weaker incentives (Williamson, 1981; Holmstrom, 1992).

4. Liquidity constraints of VCFs: The liquidity constraints of VCFs are measured by the amount of newly raised funds in the previous year (Gompers, 1995). According to free cash flow theory, the capital inflow may also impact the financiers' behaviour. More inflow of capital may lead to free cash flow problems that induce overinvestment (Jensen, 1986). Thus, more newly raised funds may lead to larger and more frequent investments.

8.4.3 Descriptive Statistics of the Sampled Data

8.4.3.1 Time series of the sample

Table 8.5 summarizes information on the time and amount of the total venture capital financing for the 436 companies. The 436 companies received 594 individual rounds of venture capital financing, which represents over one fourth of all venture capital investment in China during the period.⁵⁰

It shows that the industry was modest in size in the early years and there were less than 10 venture capital deals before 1996. 1999 and 2000 saw a sharp

⁴⁹ This study shares the same concerns with Gompers (1995) on how well the data may reflect the performance of the companies, since that it is unknown how well the companies do after each round of financing and if there are any other funding sources of the companies.

⁵⁰ According to the Annual Report on Venture Capital in China published by Zero2IPO, about 2200 venture capital deals closed in China by the end of 2005.

increase in venture capital financing with the issuance of Announcement No.1⁵¹ and the Internet boom in China. In 1999, 63 deals closed; in 2000, 134 deals closed. In 2001, the number of venture financing deals dropped dramatically to 64 after the crash of the Dot Com Bubble. It remained steady until 2004, when the number of annual venture capital deals increased again to over 100. Overall, the sample data is consistent with the aggregate data on China's venture capital industry during this period.

⁵¹ Announcement No.1 refers to the Proposal on Developing China's VC Industry presented at the Ninth Conference of the NPC in 1998. It was proposed to encourage large corporations to invest in venture capital funds. It attracted serious attention from policy makers and became Announcement No.1. A series of policies followed to promote the venture capital industry. The policies further clarified the legitimacy of corporate venture capital institutions. China's venture capital industry saw rapid development.

Table 8.5 Time Series of the Sample

This sample consists of 436 randomly selected companies backed by venture capital institutions that received their first venture capital investment prior to Jan, 2005. The table shows the number of rounds, the number of new companies in each year in the sample, the number of companies known amount of investment, the sum and average amount of investment each year.

Year	No. Financing rounds	No. rounds known Investment	Sum of Investment (\$000)	Average Investment Per Round (\$000)	No. of new firms financed
1990	1	1	248	248.00	1
1991	1	1	141	141.00	1
1992	3	3	577	192.33	3
1993	4	3	16992	5664.00	4
1994	6	5	39910	7982.00	6
1995	9	4	136621	34155.25	9
1996	16	16	52612	3288.25	8
1997	20	18	97009	5389.39	13
1998	14	9	23188	2576.44	9
1999	63	45	283865.2	6308.12	48
2000	134	82	577563.3	7043.45	107
2001	64	32	1413994	44187.32	46
2002	60	43	1077616	25060.83	46
2003	63	45	1143539	25411.98	47
2004	105	79	1145308	14497.57	88
2005	27	17	333210.9	19600.64	0
2006	4	3	24500	8166.67	0
Total	594	436	6366895	15682.01	436

8.4.3.2 Distribution by industry, investment stage, outcome and investor

Table 8.6 reports the distribution of the sampled investments across various industries by the financing rounds invested in each year. The results provide a clear picture on the transition of venture capital investment from traditional business to high-technology companies in China.

Before the late 1990s, traditional businesses such as financial services, manufacturing, and consumer-related industries, attracted the majority of venture capital financing in China. This situation changed dramatically in 1999 with a sharp increase of investment in high-technology industries. Internet, computer,

communication, and semi-conductor companies have become more attractive with the global booming of IT industries and the great emphasis of China's government on the construction of an information infrastructure and communication system in the late 1990s. The percentage of venture capital invested in high technology firms has not fallen below 70 per cent of annual investments since 1999 in China.

Overall, venture capital investment focuses on high-technology industry companies. The average industry ratio of R&D spending to value added in this sample is 5.44 per cent. The average of R&D spending to value added for all manufacturing industry is 2.45 per cent in China from 2000 to 2005. R&D-oriented companies are associated with more server information problems and higher rate of failure, which may require more expertise and effort from venture capitalists in monitoring and evaluating. The increasing number of venture investments in the high-technology industry suggests that venture capitalists in China concentrate on industries that need to be monitored and re-evaluated more often.

Panel 2 of Table 8.6 presents investment distribution by stage. The table shows a relative decline of investment in late-stage projects and an increase of investment in early-stage projects. This trend reflects the growing weight of private sectors in China since the mid-1990s. Before 1995, the majority of the economy in China was either state-owned enterprises (SOEs) or township-village enterprises (TVEs) that were later-stage companies. A growing number of newly-established companies were established in the second half of the 1990s, when the private sectors were recognized legally. In addition, this trend is consistent with the distribution of the investment across industries: most of the high-technology companies are newly established, especially those in the information technology and communication sectors. The changes in distribution of the investment across industries and stage show the growing confidence of venture capitalists in China's market, but more effort is needed to deal with risks and uncertainties associated with the projects.

Panel 3 of Table 8.6 demonstrates the distribution of investments made by different types of investors in this sample. It clearly shows strong interest from FVCFs, which are mainly organized under limited partnership, in China's venture

capital market. Overall, 64.1 per cent of the total deals were backed by FVCFs; 35.9 per cent by DVCFs.

There is a bias in the sample: the number of projects backed by FVCFs before 1999 might be overestimated. However, the bias does not really influence this analysis, since the overall proportion of venture investment deals before 1999 is very small for the overall sample. The bias is consistent with the interviews with venture capitalists. Interviews show that FVCFs disclose more investment information to the public, since they must be more transparent in order to raise funds from international markets. However, domestic VCFs were mainly funded by the government or government-tied organizations before 1999 and faced less pressure for fundraising. The situation changed gradually since 1998, when more large corporations were encouraged to invest in venture capital institutions. DVCFs also began to compete for funds, although the pressure might not be the same.

The distribution suggests that an insightful exploration on the differences in investment behaviour between FVCFs and DVCFs is important, given the two different types of VCFs operate under different organizational structure and the incentive schemes.

Table 8.6 Distribution of Venture Capital Backed Deals by Industry and Stage (Unit: %)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Panel 1: Distribution of Investment across Industries (%)																	
Internet Specific								5.00	14.29	34.92	35.07	10.94	6.67	11.11	18.10	25.93	25.00
Computer Software	100.00									14.29	16.42	18.75	28.33	15.87	6.67	14.81	
Computer Hardware								5.00		3.17	5.22	3.13	8.33	6.35	4.76	3.70	25.00
Computer Others										1.59	3.73	4.69	1.67	1.59	0.95		
Communication						11.11				9.52	11.94	15.63	20.00	25.40	25.71	11.11	
IC/Electronics					16.67		12.50		7.14	1.59	2.99	10.94	10.00	9.52	16.19	18.52	25.00
Medical/Healthcare			66.67		16.67		25.00	15.00	7.14	6.35	5.22	14.06		1.59			
Bio-technology			33.33								2.24	6.25	1.67		0.95		
Business Service											1.49	1.56	6.67	6.35	4.76	7.41	
Industrial/Energy		100.0		25.00	16.67	11.11		5.00		9.52	6.72			3.17	2.86		
Financial Service				25.00	16.67	11.11	12.50	5.00			2.24	3.13	3.33	3.17	2.86		
Consumer Related				50.00	16.67	33.33	25.00	35.00	50.00	12.70	2.24	4.69	10.00	11.11	12.38	14.81	25.00
Arg/Forestr/Fishery								10.00	7.14	1.59	2.99		1.67		0.95		
Others								5.00	7.14	4.76		1.56			0.95	3.70	
New Material/Energy											1.49	3.13			0.95		
Transportation						11.11	6.25	5.00					1.67	1.59			
Construction							12.50	5.00				1.56		1.59	0.95		
Manufacturing					16.67	22.22	6.25	5.00	7.14					1.59			
Panel: 2 Distribution of Investment by Stage (%)																	
Others								5.00	7.14	4.76		1.56			0.95	3.70	
Early Stage	100.00	100.00	33.33	50.00	50.00	22.22	37.50	25.00	28.57	50.00	55.91	61.29	53.45	47.62	48.54	29.63	25.00
Late Stage			66.67	50.00	50.00	77.78	62.50	75.00	71.43	50.00	44.09	38.71	46.55	52.38	51.46	70.37	75.00
Panel 3: Distribution of Investment by Different VCFs (%)																	

Investor: FVCFs				75.0	83.3	100.0	100.0	94.7	92.3	56.1	40.3	49.2	70.0	80.7	75.3	76.0	100.0
Investor: DVCFs	100.0	100.0	100.0	25.0	16.7			5.3	7.7	43.8	59.7	50.8	30	19.3	24.7	24.0	

Table 8.7 shows the distribution of outcomes for companies that received venture capital financing. The venture capital backed companies might go IPOs, undergo a merger or acquisition, or remain private as of 31 December 2004. Overall, the outcomes of venture capital backed companies in China substantially differ from what was found by Gompers (1995) in the United States. First, only 11.86 per cent of the entire sample went IPO in China, whereas over 22.5 per cent of firms went IPO in the United States. Furthermore, over 80 per cent of the sampled companies are still privately held⁵² in China, while the percentage of companies being privately held or bankrupted was 53.7 per cent in the United States. This implies the underdevelopment of capital markets and M&A markets in China.

In information technology, financial service, and consumer-related businesses, the proportion of the sampled companies that go public are higher than those in other industries. No companies go IPOs in the healthcare, bio-technology, construction, transportation, and manufacturing industries. These results imply that the return of venture capital investment is higher in information technology, consumer-related businesses and financial service and lower in healthcare, bio-tech, construction and manufacturing.

Table 8.7 also shows that about 15 per cent of FVC-backed companies have gone IPOs. However, the percentage for companies backed by other VCFs (including DVCFs and joint VCFs) is only 7.22 per cent. The same trend is seen in companies that have merged or have been acquired. The result empirically evidences the long-debated problems with exit channels of venture capital investment for DVCFs due to the underdeveloped capital market in China; it also raises the question of whether FVCFs indeed have more efficient monitoring and evaluating mechanisms to reduce risks and agency costs, which leads to a better rate of return.

⁵² The number of privately held companies may be overestimated, since some companies have been bankrupted merged, or acquired. However, these companies could not be distinguished due to lack of accurate information. I therefore classify all companies that have not gone IPO and have undergone M&A as privately held companies.

Table 8.7 Outcomes of the 436 Companies Backed by VC Investment

The number of companies that are privately held or merged/acquired and those that have issued IPO as of March, 2006 is stated in the table. The first column shows the number and percentage of companies that are privately held in each industry, the second column are the number and percentage of the companies that have issued IPO in each industry, and, the third demonstrates those that were merged or acquired.

Panel 1: Outcomes for 436 venture capital backed companies by industry						
	Privately Held		Went Public		Acquired	
	Number	Row %	Number	Row %	Number	Row %
Internet Specific	60	78.95	10	13.16	6	7.89
Computer Software	54	81.82	8	12.12	4	6.06
Computer Hardware	20	100				
Computer Others	10	100				
Communication	64	86.49	7	9.46	3	4.05
IC/Electronics	28	84.85	5	15.15		
Medical/Healthcare	21	100				
Bio-technology	9	100				
Business Service	6	54.55	2	18.18	3	27.27
Industrial/Energy	20	90.91	2	9.09		
Financial Service	11	73.33	4	26.67		
Consumer Related	27	65.85	12	29.27	2	4.88
Arg/Forestr/Fishery	5	83.33	1	16.67		
New Material/Energy	4	100				
Transportation	3	75			1	25
Construction	6	100				
Manufacturing	5	83.33			1	16.67
Others	5	83.33			1	16.67
Total	358	83.33	51	11.86	21	4.88
Panel 2: Outcomes for 436 venture capital backed companies by different types of investors						
Investor: FVCFs	200	78.12%	38	14.84%	18	7.03%
Investor: DVCFs	164	91.11%	13	7.22%	3	1.67%
Total	364	83.49%	51	11.70%	21	4.82%

8.4.3.3 Funding Statistics

Funding statistics by industry, outcome, and type of investor are presented in Tables 8.8 through 8.10. The average total financing received, the number of funding rounds, and the age of the companies at first funding are shown by industry, outcome, and the type of their investors. Unlike Gompers' (1995) findings, this study does not show any clear difference between high-technology industries and low-tech industries in most of the funding information. However, the pattern of the funding data is considerably different for companies with different outcomes. Furthermore, the descriptive statistics also show variability between FVCF-backed companies and companies backed by DVCFs.

The sampled data do not show visible differences in the average number of financing rounds and the average total amount of investment between high-technology companies and low-technology companies in China. This is different from the US practice documented by Gompers (1995) in which high-technology companies gain more funding than low-technology companies. This result is consistent with the interviews: the major risk concern of most venture capitalists is not the technological aspect of the projects, but the market and business model, particularly among foreign venture capitalists.

Furthermore, the sample shows that the average age of high-technology companies at the time of the first round of venture funding is less than that of low-tech companies in China. This finding also differs from Gompers' (1995) study, which does not find a clear pattern based on the data in the United States. In this sample, companies in information, communication, semi-conductor, healthcare and biotechnology industries are less than 3 years old, while companies in traditional industries such as transportation, construction, and financial service, are more than 4 years old at the time of first venture funding. The finding is consistent with most of the R&D financing literature, which suggests high-technology companies encounter more financial constraints for external investment after incorporation (Hall, 2002).

Regarding the funding structure of the venture capital backed companies by outcome, the findings share considerable similarity with the United States. The total amount of investment and number of financing rounds are greater for companies that have gone IPO than companies that are still privately held. This is consistent with Gompers' (1995) findings. This result shows that stage financing is correlated with better performance of investment. Using stage financing, venture capitalists can make better decisions on whether to offer more capital in the next round based on the information revealed.

There are also differences in funding patterns between companies backed by FVCFs and those backed by DVCFs. From the descriptive statistics, FVCF backed companies receive more total investments than DVCF backed companies. Primarily, the average amount of capital gained is \$27.3 million for FVCF backed companies and \$ 5.9 million for DVCF backed companies. This phenomenon also occurs in companies that have gone IPO. The result indicates that FVCs may need to exert more effort in monitoring activities to reduce risks, given their large amount of investment in each company compared with DVCs. This is evidenced by the statistics on total financing rounds of the venture capital backed companies. As shown in Table A1.4, the average number of financing rounds is 1.44 for FVCF backed companies and 1.20 for DVCF backed companies. FVCF backed companies that have gone IPO gain an average of 1.95 rounds of venture financing, while DVC-backed companies gain only 1.23 rounds.

Moreover, DVCF backed companies are younger than FVCF backed companies in general and for companies that have been merged and being privately held in particular. Among companies that have gone IPO, FVCF backed companies are substantially younger than DVCF backed companies. Because younger companies may face more risks and uncertainties, DVCF backed companies are expected to have more frequent monitoring activities from venture capitalists. However, the data on the total number of financing rounds as shown in Table A1.4 does not support this. The result again shows that DVCFs may be more reluctant to employ stage financing than FVCFs.

An interesting observation from the statistics is that the average number of financing rounds and the amount of total venture investments for DVCF backed companies that have undergone M&A are larger than FVCF backed companies. The results imply lack of exit channels for DVCFs in China due to the underdeveloped capital market.

Table 8.8 The Number of Financing Rounds for the Sampled 436 Companies

Panel 1: Total Number of Rounds of Investment by Industry								
	All Companies		Privately Held		Went IPO		Acquired	
Industry	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Internet Specific	1.49	1	1.33	1	2.20	2	2.00	2
Computer Software	1.22	1	1.20	1	1.25	1	1.50	1
Computer Hardware	1.40	1	1.40	1				
Computer Others	1.20	1	1.20	1				
Communication	1.19	1	1.17	1	1.43	1	1.00	1
IC/Electronics	1.45	1	1.36	1	2.00	1		
Medical/Healthcare	1.45	1	1.48	1				
Bio-technology	1.11	1	1.11	1				
Business Service	1.45	1	1.00	1	2.50	3	1.67	1
Industrial/Energy	1.14	1	1.00	1	2.50	3		
Financial Service	1.27	1	1.18	1	1.50	1		
Consumer Related	1.71	1	1.63	1	1.75	2	2.50	3
Arg/Forestry/Fishery	1.67	1	1.80	1	1.00	1		
New Material/Energy	1.25	1	1.25	1			2.00	2
Transportation	1.25	1	1.00	1				
Construction	1.00	1	1.00	1				
Manufacturing	1.17	1	1.20	1			1.00	1
Others	1.17	1	1.20	1			1.00	1
Panel 2: Number of Rounds of Investment Backed by Different VCFs								
	All Companies		Privately Held		Went IPO		Acquired	
VCFs	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Investor: FVCFs	1.44	1	1.34	1	1.95	1	1.50	1
Investor: DVCFs	1.22	1	1.20	1	1.23	1	2.67	3

Table 8.9 Age of the Companies at the First Round of Venture Financing

Panel 1: Age of the Company at the First Round of VC Investment by Industry								
	All Companies		Privately Held		Went IPO		Acquired	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Internet Specific	1.63	1	1.71	1	2.10	2	0.67	1
Computer Software	3.45	3	2.95	2	6.75	8	1.25	1
Computer Hardware	1.44	0	1.44	0				
Computer Others	1.20	0	1.20	0				
Communication	2.38	2	2.21	2	3.50	3	2.00	2
IC/Electronics	3.10	2	2.40	2	5.20	5		
Medical/Healthcare	2.63	1	2.80	1				
Bio-technology	2.00	1	2.00	1				
Business Service	2.33	1	1.00	1	0.50	0.5	5.33	7
Industrial/Energy	10.10	1	5.75	0	27.50	28		
Financial Service	4.82	5	3.00	2	8.00	8		
Consumer Related	3.05	2	2.85	2	4.75	5	1.00	1
Arg/Forestry/Fishery	2.67	0	2.67	0				
New Material/Energy	1.75	0	1.75	0				
Transportation	4.00	4	4.00	4				
Construction	4.00	3	4.00	3				
Manufacturing	4.00	4	8.00	8			0.00	0
Others	8.00	8	12.00	12			4.00	4
Panel 2: The Age of the Companies at the First Round of Investment Backed by Different VCFs								
VCFs	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Investor: FVCFs	3.34	2	3.09	2	4.84	3	2.06	2
Investor: DVCFs	2.27	1	1.80	1	8.22	8	0.67	0

Table 8.10 Total Investment Received by the Sampled 436 Companies

Panel 1: Total Investment received per Company by Industry								
	All Companies		Privately Held		Went Public		Acquired	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Internet Specific	19092.29	6290	9395.105	5000	73206.12	40000	15217.98	14000
Computer Software	6131.809	3685	6255.276	3670	4738.6	3700	8733.33	9200
Computer Hardware	19369.34	4700	19369.34	4700				
Computer Others	1281.75	78.5	1281.75	78.5				
Communication	24563.46	3000	11111.54	2450	126833.3	9000	2800	2800
IC/Electronics	82205.2	7725.05	16649.1	6998	357540.8	24315.2		
Medical/Healthcare	3962.242	3300	3962.242	3300				
Bio-technology	5831	1084.5	5831	1084.5				
Business Service	22503.43	4000	1318.5	619	56125	56125	40000	40000
Industrial/Energy	8198.688	288.5	7165.667	266	23694	23694		
Financial Service	24004.5	9500	13008.38	9500	45996.75	16193.5		
Consumer Related	11972.16	7464	9876.227	7464	17229	6750	14000	14000
Arg/Forestry/Fishery	18583.5	13817	24211.33	25164	1700	1700		
New Material/Energy	1850	1850	1850	1850				
Transportation	2369.333	920	3094	3094			920	920
Construction	7267	3453.5	7267	3453.5				
Manufacturing	7258.25	3510.5	7345	23			6998	6998
Others	20030	12000	24675	14094.5			1450	1450
Panel 2: Total Investment received per Company by Different VCFs								
VCFs	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Investor: FVCFs	27309.57	6500.10	12163.85	5800	109076.22	23694	11982.15	6998
Investor: DVCFs	5912.07	1756	5272.33	1000	11400.00	3385	9830	9200

Table 8.11 Industry, Outcomes and Investors of the 436 Companies

Panel 1: Number of Companies by Industry				
	Full	Privately Held	Went Public	Acquired
Internet Specific	76	60	10	6
Computer Software	66	54	8	4
Computer Hardware	20	20		
Computer Others	20	10		
Communication	74	64	7	3
IC/Electronics	33	28	5	
Medical/Healthcare	21	21		
Bio-technology	9	9		
Business Service	11	6	2	3
Industrial/Energy	22	20	2	
Financial Service	15	11	4	
Consumer Related	41	27	12	2
Arg/Forestry/Fishery	6	5	1	
New Material/Energy	4	4		
Transportation	4	3		1
Construction	6	6		
Manufacturing	6	5		1
Others	6	5		1
Panel 2: Number of Firms Known Current Public Status backed by Different VCFs				
	All Companies	Active Investment	Went Public	Acquired
Investor: FVCFs	236	200	38	18
Investor: DVCFs	200	164	13	3

8.5 Quantitative Findings and Analysis

8.5.1 Total Number of Financing Rounds and Financial Size

Table 8.12 reports the regression results on the relation between the performance of the venture capital backed companies and venture capitalists' stage financing arrangements. Panel A is the Poisson regression on the total number of financing rounds. Panel B is the OLS regression on total amount of investment received by the venture capital backed company. Overall, the regression results confirm that the financing stage intensities, measured by the number of financing stages and the total amount of investments, are associated with the performance of the venture investment in China. As shown from the Poisson regression results in Panel A,⁵³ companies that have gone public received significantly more venture financing rounds than those that remain private. Additionally, companies that have been acquired or merged also gained more venture financing rounds than those that remain private, although the power and significance are not as strong as with companies that went public. The same pattern is seen in the relationship between the outcomes of venture capital backed companies and the amount of total investment, as shown in Panel B.

The results imply that, consistent with most of the existing literature, stage financing helps VCFs to terminate bad projects with the information revealed over time in China. When VCFs see potential from portfolio companies to issue IPO or to be sold to other buyers during re-evaluation for next financing round, they may choose to continue the investment; otherwise, they may withdraw future investments.

To a large extent, this finding is similar to results in the US venture capital market (Gompers, 1995). However, a major difference is that stage intensities for Chinese companies that are acquired and those that are privately held are statistically the same. A plausible explanation of this difference is that M&A is an important alternative channel for venture capital divestment in China where the capital markets are still underdeveloped. This is particularly true for DVCFs that have fewer choices

⁵³ This study uses Poisson regression to estimate the number of financing rounds, since the variable is ordinal and non-negative.

for divestment. Even FVCFs may face similar problems. For example, the shareholders in international capital markets may have less confidence in China's political or legal environments or less knowledge of Chinese business models.

Measuring agency cost by asset intangibility (companies with more intangible assets may have more severe agency problems) by R&D spending (R&D projects involve more agency problems than other investments), Panel A shows that asset intangibility is significantly and positively correlated with the total number of financing rounds. Moreover, the size and the significance of the effects of asset intangibility substantially increase when the measure of R&D spending in new product development is included in the regression. The correlation test shows that asset intangibility is closely related with R&D spending in new product development in China. Companies in industries that spend more on new product development have more intangible assets; as a result, these companies encounter more severe agency problems. Thus, venture capitalists tighten their monitoring activities by periodically staging capital infusion. Similarly, as shown in Panel B, industries with more intangible assets receive more total investment through the greater number of financing rounds, although the effects are not statistically significant. However, R&D intensity does not seem impact the total amount of financing or the number of venture financing rounds. Overall, the findings in China are similar to the US practice discovered by Gompers (1995), which also confirms that intangibility is the most important industry factor explaining total venture financing and the number of venture financing rounds.

Concerning the impact of governance structures of VCFs on stage intensity, Table 8.12 confirms the hypothesis that VCFs with different corporate structures use stage financing differently. As shown in Panel A, companies backed by LPVCFs gain more financing rounds than companies backed by LCVCFs, although the effects are weakened when agency costs and uncertain factors are included. However, the regression also demonstrates that VCFs' governance structures improve the effects of agency costs substantially. The correlation analysis shows that LPVCFs invest more in industries with higher R&D intensity and a higher ratio of intangible assets. This

may shed light on why LPVCFs use more stage financing than LCVCFs. At the same time, the total investment size gained by companies backed by LPVCFs is much larger than those backed by LCVCFs. As a matter of fact, VCF governance structure is the most important factor among all variables in determining the size of total investment in China. The result shows that LPVCFs invest more capital in companies associated with more risks and uncertainties in China. Accordingly, they arrange more stage financing deals in order to reduce the potential risks and uncertainties.

As discussed in the previous section, most US venture capital firms are structured as limited partnerships. Therefore, investment activities of the LPVCFs under China's institutional environment may differ from their counterparts in the United States. Given this study is an examination on investment activities of VCFs under different governance structures within China, other institutional environments are controlled to identify how institutions impact business behaviour in China.

Table 8.13 reports the regression results of stage intensity for companies backed by LPVCFs. Table 8.14 reports the regression results for companies backed by LCVCFs. The analysis demonstrates that LPVCFs behave similarly to their counterparts in the United States, whereas LCVCFs behave differently. As illustrated in Table 8.13, for the companies backed by LPVCFs, performance is closely related to the number of financing rounds and total investment. Companies that have gone IPO received substantially more venture financing rounds and more total investment. The industry ratio of intangibility is also related to the number of financing rounds, although the effects are not significant statistically.

In contrast, for companies backed by LCVCFs, companies that have gone IPO received substantially fewer financing rounds than those that remain private (Table 8.14). However, companies that have been acquired experienced more intensive stage financing. Companies with more intangible assets gain more total investments, but the number of financing rounds does not increase accordingly. This result implies that VCFs under the limited company structure did not deploy stage intensity to respond to agency costs. That is, VCFs behave differently depending on their corporate governance structure.

Table 8.12 Regressions for the Number of Financing Rounds and Total Investment of the Venture Capital Backed Companies

The sample is 436 randomly selected venture capital backed companies in China prior Jan 2005. Estimates are from Poisson regression for Panel A and OLS regression for Panel B (t-statistics for the regression coefficients are in parentheses). The dependent variable is the number of total financing rounds in Panel A and logarithm of the amount of total funding revived by the company in thousands in constant 2000 US Dollar in Panel B. Independent variables include a dummy variable that equal 1 if the company completed an initial public offering, a dummy variable that equals 1 if the company was acquired, and a dummy variable that equals 1 if the company was backed by LPVCFs. Age of the company refers to the age of the company at the first venture financing round that is calculated by year. Intangibility of assets is measured by the average ratio of intangible assets to total assets for the firms in the company's industry. R&D intensity is proxied by the average industry ratio of R&D spending to value added or R&D spending in new products development to value added.

Panel A Regression for the Number of Financing Rounds

DEPENDENT VARIABLES: THE NUMBER OF FINANCING ROUNDS RECEIVED BY ALL VC-BACKED COMPANIES								
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	0.102 (1.29)	0.338 (3.60)	0.107 (0.81)	0.174 (4.59)	0.356 (1.83)	-0.131 (-0.68)	0.280 (1.36)	-0.171 (-0.88)
VCs exited via IPO	0.359 (3.15)	0.316 (2.73)	0.316 (2.70)	0.301 (3.35)	0.316 (2.72)	0.322 (2.76)	0.300 (2.67)	0.312 (2.74)
VCs exited via M&A	0.205 (1.69)	0.204 (1.63)	0.211 (1.69)	0.230 (1.95)	0.203 (1.62)	0.211 (1.75)	0.185 (1.37)	0.198 (1.54)
Ratio of intangible assets to total assets	0.005 (1.55)				-0.005 (-0.13)	0.072 (1.87)	0.006 (0.14)	0.077 (2.03)
Ratio of R&D spending to value added		-0.025 (-1.12)			-0.027 (-0.94)		-0.025 (0.89)	
Ratio of R&D spending in new products development to value added			0.030 (0.96)			0.046 (1.41)		0.046 (1.40)
Investor-LPVCFs				0.126 (2.07)			0.080 (1.33)	0.054 (0.95)
Pseudo R square	0.008	0.007	0.007	0.01	0.007	0.008	0.007	0.008
Chi-square	15.03	10.97	12.52	25.62	11.00	16.49	12.95	17.37
Log pseudo likelihood	-423.89	-392.73	-382.29	-549.14	-392.76	-382.01	-392.44	-381.87

Panel B Regression for the Total Investment

DEPENDENT VARIABLE: LOGARITHM OF TOTAL VENTURE FINANCING RECEIVED								
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	2.989 (11.87)	3.372 (16.88)	3.246 (12.45)	3.226 (5.26)	2.738 (5.44)	2.837 (33.36)	1.987 (3.71)	1.694 (3.84)
VCs exited via IPO	.944 (4.75)	0.894 (4.43)	0.867 (4.30)	0.895 (4.4)	0.880 (4.36)	0.673 (4.78)	0.514 (2.91)	0.474 (2.67)
VCs exited via M&A	0.438 (1.55)	0.453 (1.54)	0.418 (1.42)	0.461 (1.56)	0.411 (1.40)	0.302 (1.41)	0.237 (0.94)	0.181 (0.72)
Ratio of intangible assets to total assets	0.148 (1.37)			0.43 (0.25)	0.17 (1.18)		0.126 (0.87)	0.204 (1.67)
Ratio of R&D spending to value added		-0.003 (-0.06)		0.008 (0.13)			0.012 (0.22)	
Ratio of R&D spending in new products development to value added			0.032 (0.54)		0.060 (0.94)			0.033 (0.60)
Investor-LPVCFs						0.827 (8.08)	0.792 (6.96)	0.785 (6.82)
R-Square	0.096	0.088	0.087	0.088	0.089	0.247	0.355	0.359
F-Statistics	8.473	7.029	6.723	5.265	5.398	33.209	19.777	19.572

Table 8.13 Regressions for the Number of Financing Rounds and Total Investment for Companies Backed by LPVCFs

The sample is composed by 256 companies backed by LPVCFs in China prior Jan 2005. Estimates are from Poisson regression for Panel A and OLS regression for Panel B (t-statistics for the regression coefficients are in parentheses.). The dependent variable is the number of total financing rounds in Panel A and logarithm of the amount of total funding revived by the company in thousands in constant 2000 US Dollar in Panel B. Independent variables include a dummy variable that equal 1 if the company completed an initial public offering, a dummy variable that equals 1 if the company was acquired. Age of the company refers to the age of the company at the first venture financing round that is calculated by year. Intangibility of assets is measured by the average ratio of intangible assets to total assets for the firms in the company's industry. R&D intensity is proxied by the average industry ratio of R&D spending to value added or R&D spending in new products development to value added.

Panel A Regression for the Number of Financing Rounds

DEPENDENT VARIABLE: NUMBER OF FINANCING ROUNDS					
Independent variables	(1)	(2)	(3)	(4)	(5)
(Constant)	0.087 (0.46)	0.371 (2.88)	0.769 (0.44)	0.183 (0.41)	-0.127 (-0.51)
VCs exited via IPO	0.484 (3.90)	0.435 (3.44)	0.444 (3.41)	0.435 (3.44)	0.449 (3.44)
VCs exited via M&A	-0.029 (-0.27)	-0.031 (-0.28)	-0.013 (-0.12)	-0.023 (-0.21)	-0.011 (-0.10)
Ratio of intangible assets to total assets	0.075 (0.87)			-0.058 (0.43)	0.075 (1.00)
Ratio of R&D spending to value added		-0.026 (-0.85)		-0.013 (-0.30)	
Ratio of R&D spending in new products development to value added			0.039 (0.95)		0.047 (1.17)
Pseudo R square	0.018	0.014	0.016	0.014	0.017
Log pseudo likelihood	-234.850	-220.650	-214.324	-220.622	-214.227

Panel B Regression for Total Venture Financing

DEPENDENT VARIABLE: LOGARITHM OF TOTAL VENTURE FINANCING					
Independent variables	(1)	(2)	(3)	(4)	(5)
(Constant)	3.569 (13.096)	3.592 (19.615)	3.562 (15.003)	3.158 (4.409)	3.531 (7.516)
VCs exited via IPO	0.791 (4.78)	0.775 (4.60)	0.777 (4.596)	0.775 (4.586)	0.777 (4.576)
VCs exited via M&A	0.07 (0.031)	0.073 (0.288)	0.045 (0.177)	0.095 (0.370)	0.045 (0.177)
Ratio of intangible assets to total assets	0.053 (0.443)			0.134 (0.627)	0.011 (0.077)
Ratio of R&D spending to value added		0.025 (0.584)		0.057 (0.885)	
Ratio of R&D spending in new products development to value added			0.032 (0.582)		0.033 (0.577)
R-Square	0.133	0.139	0.138	0.141	0.138
F-Statistics	7.697	7.472	7.327	5.678	5.547

Table 8.14 Regressions for the Number of Financing Rounds and Total Investment for Companies Backed by LCVCs

The sample is composed by 180 companies backed by LCVCs in China prior Jan 2005. Estimates are from Poisson regression for Panel A and OLS regression for Panel B (t-statistics for the regression coefficients are in parentheses). The dependent variable is the number of total financing rounds in Panel A and logarithm of the amount of total funding received by the company in thousands in constant 2000 US Dollar in Panel B. Independent variables include a dummy variable that equal 1 if the company completed an initial public offering, a dummy variable that equals 1 if the company was acquired. Age of the company refers to the age of the company at the first venture financing round that is calculated by year. Intangibility of assets is measured by the average ratio of intangible assets to total assets for the firms in the company's industry. R&D intensity is proxied by the average industry ratio of R&D spending to value added or R&D spending in new products development to value added.

Panel A Regression for the Number of Financing Rounds

DEPENDENT VARIABLES: THE NUMBER OF FINANCING ROUNDS RECEIVED					
Independent variables	(1)	(2)	(3)	(4)	(5)
(Constant)	0.089 (1.16)	0.319 (2.47)	0.167 (0.94)	0.415 (1.60)	-0.0507 (-0.17)
VCs exited via IPO	-0.183 (-4.55)	-0.213 (-4.63)	-0.216 (-4.78)	-0.218 (-4.52)	-0.208 (-4.56)
VCs exited via M&A	0.785 (7.11)	0.748 (6.52)	0.760 (6.93)	0.742 (6.36)	0.745 (7.00)
Ratio of intangible assets to total assets	0.043 (1.06)			-0.024 (0.608)	0.05 (0.95)
Ratio of R&D spending to value added		-0.028 (-0.94)		-0.037 (-0.94)	
Ratio of R&D spending in new products development to value added			0.017 (0.28)		0.031 (0.64)
Pseudo R square	0.012	0.013	0.012	0.013	0.0129
Log pseudo likelihood	-185.099	-168.752	-164.766	-168.734	-164.66

Panel B Regression for Total Venture Financing

DEPENDENT VARIABLE: LOGARITHM OF TOTAL VENTURE FINANCING RECEIVED					
Independent variables	(1)	(2)	(3)	(4)	(5)
(Constant)	2.065 (5.341)	3.336 (8.645)	2.657 (5.092)	3.139 (3.189)	0.854 (0.859)
VCs exited via IPO	0.577 (1.185)	0.491 (0.980)	0.500 (0.966)	0.499 (0.988)	0.544 (1.075)
VCs exited via M&A	1.148 (1.847)	1.037 (1.617)	1.095 (1.662)	1.047 (1.618)	0.993 (1.538)
Ratio of intangible assets to total assets	0.305 (1.892)			0.054 (0.218)	0.527 (2.111)
Ratio of R&D spending to value added		-0.131 (-1.390)		-0.141 (-0.920)	
Ratio of R&D spending in new products development to value added			0.048 (0.407)		0.180 (1.37)
R-Square	0.092	0.074	0.049	0.074	0.105
F-Statistics	2.75	2.012	1.244	1.502	2.092

8.5.2 Duration and the Size of Investment per Financing Round in China

Stage duration and investment size per financing round are also measured for stage financing. Given that entrepreneurs usually have few tangible assets to be used as collateral, a VC investment may be sunk if a project does not go well. VCFs should therefore adjust the frequency of financing stages. The empirical literature shows that venture capitalists shorten the duration and reduce the size of investment per round for projects with higher risks in the US in order to mitigate the risks of loss (Gompers, 1995; Kaplan and Per Stromberg, 2003; 2004). This section investigates how VCFs structure their stage financing in China and whether VCFs under different corporate governance structures behave differently in terms of stage financing.

Table 8.15 summarizes the average duration, amount of venture capital funding, and the number of deals by development stage of the companies at the time of venture financing, and the type of VCFs in China.⁵⁴ Overall, only 29 stage financing deals occurred with early-stage projects. The majority of the stage financing deals occurred during the expansion stage. More information on performance is revealed with the development of the companies. The results imply that venture capitalists try to re-evaluate the performance of their portfolio companies at the expansion stage based on additional information received. Table 8.15 shows that the financing duration for early-stage deals is shorter than that for later stage deals. For companies at later stages, more information is revealed to VCFs, and the amount of tangible assets increases. Therefore, late-stage companies may be associated with fewer agency problems and uncertainty. Hence, venture capitalists may be willing to invest more capital per round and reduce staging frequency.

⁵⁴ The analysis in this study classifies each financing stage according to the company's stage of development at the time of financing as reported by the VentureEconomics' database or the disclosures from VCFs. The information is self-reported by venture capital firms. There are no clear divisions between the definitions of each stage, so divisions should be seen as relative measures rather than absolute measures (Gompers, 1995).

Table 8.15 The Duration and Investment Size per Financing Rounds

	Duration of Financing Round			Average Investment Per Round (\$000)		
	Mean	Median	Valid N	Mean	Median	Valid N
Seed/Start-up	1.000	1	7	4631.160	1086.00	57
Early Stage	.864	1	22	19126.621	3062.50	84
Expansion	1.375	1	96	11291.617	5047.50	216
Later Stage	2.214	2	14	48307.115	15282.00	20
LBO/Acquisition	2.750	2	4	75066.455	6600.00	11
Other Stage	1.273	1	11	15283.571	1650.00	14

Table 8.16 reports the regression results for determinants of stage duration and investment size per financing round for all 436 companies in this sample. Panel A shows the results of the Cox regressions for funding duration, that is, the time in years from one venture financing round to the next. Panel B shows the results of the OLS regressions for funding size per investment. Two dummy variables are included in the regression to capture the development stages of venture capital backed companies: early (dummy variable equals one if the company is in the early stage at time of financing) and middle (dummy equals to one if the company is in the middle stage). The development stage of the companies is reported by VCFs. Another dummy variable is included in the regression to capture the VCF's corporate structure: LPVCF, which equals one if the company is backed by a VCF under limited partnership. Agency costs, company factors, and venture capital market liquidity factors are also included.

The results in Table 8.16 suggest that stage duration decreases with greater R&D intensity. Both R&D intensity variables are negatively and significantly correlated to financing duration in China. Higher R&D intensity is usually associated with more uncertainties and more severe agency problems. Thus, venture capitalists must shorten each stage to increase stage intensity in order to monitor progress. This finding is consistent with theory and with the US data (Gompers, 1995). The intangibility of assets is negatively and significantly associated with stage duration when VCF's governance structure and the ratio of R&D spending in new product

development are included in the regression. Otherwise, intangibility of assets has no statistically significant relationship with stage duration.

Agency costs are included in regressions 4 and 5. The R&D intensity variables remain negatively and significantly correlated to financing duration. In addition, the size and significance level for the effects of R&D spending on new product development to value added substantially increase when assets intangibility is included. The effects of intangibility of assets greatly improve when R&D spending on new product development is added to the regression. Given that the ratio of R&D spending on new product development is significantly correlated to asset intangibility, industries that invest more in R&D for new product development are more likely to have a higher ratio of intangible assets and thus higher agency costs. The overall impact of agency costs on venture capitalists' stage financing is similar to the findings of Gompers (1995).

Furthermore, the age of the companies at the time of venture financing is significantly and positively related to financing duration in China. The financing duration for younger companies is substantially shorter for older companies. Younger companies normally have little information about their track records and face more internal and external uncertainties. Hence, venture capitalists finance them with more intensive stages. Similarly, companies at early stages are associated with shorter financing duration.

Panel B reports the regression for the size of investment per financing round. The development stage is significantly and negatively correlated with the size of investment per financing round. Early and middle stage companies gain substantially less capital per round than those in later stages. Projects in earlier stages are more uncertain. Therefore, venture capitalists are more cautious in the size of the investment per round. This result is consistent with the findings from the United States (Gompers, 1995; Kaplan and Per Stromberg, 2003; 2004). However, this study also finds that there is no significant relationship between the age of companies and the investment size per funding round in China. That is because some early stage projects are carried out by more mature companies in China. However, the results in

Panel B of Table 8.16 indicate that there is no statistically significant relationship between agency costs and the size of each round of investment.⁵⁵

Examining the impact of liquidity constraints of VCFs on their stage intensity, the results in Table 8.9 show that the duration between financing rounds is significantly and negatively associated with the inflow of capital, whereas the pattern for investment size per round is opposite. The result is similar to the findings from the United States (Gompers, 1995). This indicates that stage financing is associated with harder budget constraints of the VCFs (Dewatripont and Maskin, 1995; Huang and Xu, 1998). It may also indicate that control over free cash flow provides incentives to venture capitalists to invest more carefully (Jensen, 1986).

In this sample, 70 of 256 companies backed by LPVCFs were financed with stage financing, compared to only 26 of 186 companies backed by LCVCFs. Moreover, we have financing duration data for 54 LPVCF backed companies and 10 LCVCF backed companies. Given the small sample size of the stage duration data from LCVCFs, no statistic relationship between financing duration and governance structure was found.

The regression in Panel B of Table 8.16 shows that the investment size per financing round of the companies backed by LPVCFs is substantially larger than those backed by LCVCFs in China. This implies that the examination actually shows the regularity of financing duration of LPVCF backed companies solely.

Table 8.17 reports the investment size of the companies backed by LPVCFs, while Table 8.18 demonstrates the investment size of companies backed by LCVCFs. The results in Table 8.17 show that the pattern of the investment size per round gained by LPVCF backed companies is similar to the discoveries from the United States. Companies at both early and middle stages gained substantially less capital per round than later stage companies. Age is significantly and positively associated with the size of investment. The significance and power of the effects of both company specific

⁵⁵ A plausible explanation is that China lacks protection for intellectual property rights that discourage high-tech companies to file patents. At the same time, the accounting standards for the calculation of intangible assets in China are different from that in Western countries.

factors increases. An interesting phenomenon shown in Panel A is the significantly negative relationship between intangibility of assets and the investment size per round of the companies backed by LPVCFs. Another interesting finding is that the effect of capital inflow on the size of investment substantially decreases for LPVCFs. The result is mirrored by Table 8.18, which shows that the effect of capital inflow for LCVCFs substantially increases when the firms are examined separately. However, Table 8.18 shows that there is no statistically significant relationship between agency costs or development stage to investment size for companies backed by LCVCFs. These results indicate that VCFs under different corporate governance structures are completely different in dealing with agency costs and uncertainties.

Table 8.16 Regressions for the Duration and Investment Size per Round

The sample is 594 funding rounds for 436 venture capital backed companies for the period 1990 to 2006. Panel A is the maximum likelihood estimates for Cox regression survival models (P-value for coefficients are in parentheses.). Panel B is estimates for OLS regression (t-statistics for coefficients are in parentheses.). The dependent variable for Panel A is the time in years from funding date to the next funding dates. The dependent variable for Panel B is logarithm of the round's funding amount in thousands of 2000 US Dollars. Independent variables include a dummy variable that equals 1 if the funding round is at either early development stage (i.e. seed, start-up, early, first, or other early stages) and a dummy variable that equals 1 if the funding rounds is at middle stage (expansion stage, second stage, and other expansion stage), and, a dummy variable that equals to 1 if the company was backed by LPVCFs. Liquidity in the venture capital industry is controlled using new fund raised in previous year in millions in constant 2000 US dollars. Intangibility of assets is measured by the average ratio of intangible assets to total assets for the firms in the company's industry. R&D intensity is proxied by the average industry ratio of R&D spending to value added or R&D spending in new products development to value added.

Panel A Regression for Duration of Funding *per* Round

DEPENDENT VARIABLE: DURATION BETWEEN FINANCING ROUNDS						
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Investment in Early Staged company	-0.603 (0.07)	-0.34 (0.19)	-0.143 (0.22)	-0.449 (0.09)	-0.221 (0.09)	-0.20 (0.32)
Investment in Middle Staged company	0.039 (0.95)	0.177 (0.94)	-0.249 (0.77)	0.17 (0.92)	-0.234 (0.80)	-0.064 (0.92)
Capital raised in previous year (\$ mil)	-0.001 (0.07)	-0.001 (0.05)	-0.002 (0.006)	-0.001 (0.09)	-0.002 (0.06)	0.001 (0.07)
Logarithm of the amount of venture financing this round	0.374 (0.07)	0.474 (0.03)	0.266 (0.10)	0.453 (0.04)	0.266 (0.09)	0.192 (0.14)
Age of the company at the time of Investment	0.323 (0.000)	0.308 (0.000)	0.243 (0.001)	0.311 (0.000)	0.253 (0.000)	0.093 (0.000)
Ratio of intangible assets to total assets	-0.067 (0.25)			-0.083 (0.22)	-0.176 (0.10)	
Ratio of R&D spending to value added		-0.174 (0.11)		-0.18 (0.10)		
Ratio of R&D spending in new products development to value added			-0.182 (0.09)		-0.294 (0.04)	
Investor--LPVCFs						0.325 (0.803)
Chi-square	26.825	26.127	24.971	27.499	27.52	16.926
-2 Log Likelihood	404.382	405.080	307.022	403.708	304.473	607.379

Panel B Regression for Funding Size *per* Financing Round

DEPENDENT VARIABLE: LOGARITHM OF AMOUNT OF FUNDING PER ROUND								
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	3.657 (22.86)	3.503 (21.23)	3.400 (15.54)	3.550 (17.07)	3.237 (8.85)	3.276 (28.05)	3.369 (16.10)	3.012 (8.38)
Investment in Early Staged company	-0.503 (-3.67)	-0.565 (-4.23)	-0.573 (-4.15)	-0.563 (-4.20)	-0.572 (-4.41)	-0.379 (-3.13)	-0.509 (-3.86)	-0.513 (-3.79)
Investment in Middle Staged company	-0.189 (-1.74)	-0.234 (-2.20)	-0.215 (-1.92)	-0.234 (-2.19)	-0.217 (-1.92)	-0.111 (-1.15)	-0.232 (-2.20)	-0.21 (-1.90)
Capital raised in previous year (\$ mil)	0.001 (3.74)	0.001 (3.37)	0.001 (3.71)	0.001 (3.15)	0.001 (3.65)	0.001 (5.17)	0.001 (3.11)	0.001 (3.39)
Age of the Company at the Time of Investment	-0.018 (-0.97)	-0.023 (-1.24)	-0.023 (-1.15)	-0.023 (-1.22)	-0.025 (-1.22)	-0.014 (-1.27)	-0.043 (-1.96)	-0.021 (-1.05)
Industrial ration of intangible assets to total assets	-0.023 (-0.51)			-0.025 (-0.56)	0.023 (0.41)		-0.030 (-0.71)	0.014 (0.24)
Industrial ratio of R&D spending to value added		0.05 (1.42)		0.052 (1.41)			0.030 (0.82)	
Industrial ratio of R&D spending in new products development to value added			0.058 (1.38)		0.081 (1.45)			0.069 (1.27)
Investor--LPVCFs						0.311 (3.26)	0.355 (3.41)	0.407 (3.83)
R-Square	0.144	0.152	0.159	0.164	0.157	0.166	0.206	0.182
F-Statistics	6.66	7.581	6.72	6.42	5.67	10.409	7.155	6.970

Table 8.17 Regressions for the Investment Size per Round for Companies Backed by LPVCFs

The sample is 381 funding rounds for 256 LPVCF backed companies for the period 1990 to 2006. It reports the estimates for OLS regression (t-statistics for coefficients are in parentheses.). The dependent is logarithm of the round's funding amount in thousands of 2000 US Dollars. Independent variables include a dummy variable that equals 1 if the funding round is at either early development stage (i.e. seed, start-up, early, first, or other early stages) and a dummy variable that equals 1 if the funding rounds is at middle stage (expansion stage, second stage, and other expansion stage). Liquidity in the venture capital industry is controlled using new fund raised in previous year in millions in constant 2000 US dollars. Intangibility of assets is measured by the average ratio of intangible assets to total assets for the firms in the company's industry. R&D intensity is proxied by the average industry ratio of R&D spending to value added or R&D spending in new products development to value added.

DEPENDENT VARIABLE: LOGARITHM OF AMOUNT OF FUNDING PER ROUND					
Independent variables	(1)	(2)	(3)	(4)	(5)
(Constant)	4.205 (22.817)	3.819 (20.315)	3.730 (15.268)	4.036 (16.414)	3.996 (8.977)
Investment in Early Staged company	-0.727 (-4.67)	-0.714 (-4.601)	-0.747 (-4.675)	-0.732 (-4.707)	-0.756 (-4.697)
Investment in Middle Staged company	-0.351 (-2.961)	-0.344 (-2.914)	-0.357 (-2.836)	-0.358 (-3.013)	-0.366 (-2.878)
Capital raised in previous year (\$ mil)	0.001 (1.828)	0.001 (2.093)	0.001 (2.600)	0.001 (1.583)	0.001 (2.042)
Ratio of intangible assets to total assets	-0.087 (-1.784)			-0.076 (-1.531)	-0.057 (-0.839)
Ratio of R&D spending to value added		0.049 (1.268)		0.041 (1.039)	
Ratio of R&D spending in new products development to value added			0.060 (1.283)		0.031 (0.490)
Age of the Company at the Time of Investment	-0.043 (-1.96)	-0.045 (-2.057)	-0.047 (-2.021)	-0.044 (-1.993)	-0.048 (-2.070)
R-Square	0.183	0.144	0.188	0.155	0.160
F-Statistics	6.29	5.939	6.172	5.424	5.313

Table 8.18 Regressions for Investment Size per Round for Companies Backed by LCVCFs

The sample is 231 funding rounds for 180 LPVCF backed companies for the period 1990 to 2006. It reports the estimates for OLS regression (t-statistics for coefficients are in parentheses.). The dependent is logarithm of the round's funding amount in thousands of 2000 US Dollars. Independent variables include a dummy variable that equals 1 if the funding round is at either early development stage (i.e. seed, start-up, early, first, or other early stages) and a dummy variable that equals 1 if the funding rounds is at middle stage (expansion stage, second stage, and other expansion stage). Liquidity in the venture capital industry is controlled using new fund raised in previous year in millions in constant 2000 US dollars. Intangibility of assets is measured by the average ratio of intangible assets to total assets for the firms in the company's industry. R&D intensity is proxied by the average industry ratio of R&D spending to value added or R&D spending in new products development to value added.

DEPENDENT VARIABLE: LOGARITHM OF AMOUNT OF FUNDING PER ROUND					
Independent variables	(1)	(2)	(3)	(4)	(5)
(Constant)	2.614 (9.723)	3.092 (10.062)	2.741 (6.377)	3.073 (8.439)	2.515 (4.047)
Investment in Early Staged company	0.037 (0.153)	0.054 (0.224)	-0.032 (-0.129)	0.050 (0.202)	-0.069 (-0.268)
Investment in Middle Staged company	0.061 (0.267)	0.091 (0.420)	0.050 (0.221)	0.085 (0.376)	0.019 (0.081)
Capital raised in previous year (\$ mil)	0.001 (3.69)	0.001 (3.806)	0.001 (2.584)	0.001 (3.763)	0.001 (2.606)
Ratio of intangible assets to total assets	0.045 (0.537)			0.008 (0.103)	0.052 (0.508)
Ratio of R&D spending to value added		-0.111 (-1.257)		-0.110 (-1.209)	
Ratio of R&D spending in new products development to value added			0.022 (0.252)		0.053 (0.496)
Age of the Company at the Time of Investment	0.026 (0.723)	0.020 (0.593)	0.023 (0.635)	0.020 (0.569)	0.020 (0.516)
R-Square	0.186	0.200	0.067	0.183	0.052
F-Statistics	3.518	3.697	1.93	3.021	1.462

Overall, the regression examinations confirm the predictions raised in the previous section. However, it should be noted that the R-squares for the Poisson regressions and the OLS regressions on the size of the investment per financing round are relatively low. The R-square values for the Poisson regressions range from 0.007 to 0.017. The R-square values for the OLS regressions on the size of the investment per financing round range from 0.052 to 0.20. Although it is suggested that the R-squares value for the Poisson regressions are normally lower than in the OLS regressions, the low R-square values indicates that other factors may better explain the

total number of financing rounds. However, the lack of data has long been a common concern in studies on venture capital investment, and it is difficult for researchers to test other possibilities. Low R-square values have also been reported by Gompers (1995) that range from 0.007 to 0.02 for the regression for the total number of financing rounds of the venture capital backed companies in the United States. The regressions show that the corporate governance structure of the VCFs is associated with the stage financing arrangements in China. Additionally, the stage financing arrangements are correlated with agency problems and the performance of venture capital investment only when the VCF structured as a limited partnership.

8.5.3 Alternative Explanations

While the results from the above sections are consistent with the predictions that institutions have impacts on VCs' stage financing strategy in China, alternative explanations may explain the results.

Above all, similar to the discussion in Chapter 6, it might be argued that VCs' different stage financing strategy is the result of the distinctions between domestic and foreign VCFs rather than the differences between VCFs under the two different governance structures since the governance structure is proxied by the origin of the VCFs. In addition, the existing literature indeed reports that the business behaviours of players in domestic and foreign companies are different in many aspects. However, the interviews with VCs show that the corporate governance of VCFs has more power than the origin of VCFs in predicting VCs' stage financing strategy in China.

As there are three foreign VCFs structured as limited companies among the interview samples, it provides a good opportunity for looking into the insights of this issue. In order to gain more insights and clearer ideas on how the governance structure of venture capital firms affects VCs' investment activities, Table 8.19 compares the findings from the semi-structured interviews with FVCs from limited partnerships and limited companies, and, domestic limited companies separately.

It shows that both the subjective views from VCs in these three foreign limited companies and their stage financing arrangements in reality are more similar with

those of the domestic venture capital firms, which are also structured as limited companies, but substantially different from those of their foreign peers under limited partnership. For example, as shown in Table 8.19, similar to domestic VCFs, these three foreign limited companies arrange ex-ante stage financing contracts much less frequently than the other 19 foreign VCFs under limited partnership. Additionally, as shown in Table 8.20, these three foreign VCFs structured as limited companies also share more similarities in the management of portfolio companies with the domestic limited companies than with the foreign VCFs under limited partnership. That is, these three foreign VCFs that structured as limited companies communicate and visit their portfolio companies much less frequently than the other 19 foreign VCFs which are structured as limited partnerships. Similar regularities are also seen in the punishment of the unsatisfied projects by the different types of VCFs.

Table 8.19 Stage Financing Activities of Foreign LPVCFs, Foreign LCVCFs and DVCFS

	FVCFS		DVCFS
	LPVCFs (#)	LCVCFs (#)	LCVCFs (#)
Q1: Whether you have ever invested the capital by instalments?			
Yes	89.47% (17)	66.67% (2)	66.67% (8)
No	11.53% (2)	33.33% (1)	33.33% (4)
Q2: What is the ratio of the ex-ante staging arrangements in your investment in China?			
	49.16%	13.97%	18.45%
Q3: Would you consider funding next rounds if you see great potentials from the company?			
Yes	94.74%(18)	100% (3)	91.67%(11)
No	5.26%(1)	0 (0)	8.34%(1)

Table 8.20 Management of Portfolios of Foreign LPVCFs, Foreign LCVCFs and DVCFS

	FVCFS		DVCFS
	LPVCFs (#)	LCVCFs (#)	LCVCFs (#)
Q4: How often you talk to/visit the entrepreneurs/management teams?			
More than three times a week	63.16% (12)	0 (0)	20% (3)
Once a week	36.84% (7)	100% (3)	60% (7)
Once two weeks			20% (2)
Q5: How often you need the portfolio company to provide their financial reports?			
Monthly	94.74% (18)		46.67% (7)
Seasonally		66.67% (2)	33.33% (3)
Randomly	5.26% (1)	33.33% (1)	20% (2)

Q6: How often you talk to/visit the entrepreneurs/management teams in the two months before you make the refinancing decision?			
More than three times a week	94.74% (18)	66.67% (2)	46.67% (5)
Once a week	5.26% (1)	33.33% (1)	53.33% (7)

In general, although the sample of the three foreign limited companies is small in number, the interviews with VCs confirm that confirms that the regularities of VCs' stage financing strategy is more alongside with the line of the governance structure of the VCF rather than if the VCF is foreign or domestic. Combining both the interview analysis and statistical examinations, this study suggests that VCFs under different governance structure vary from each other in ownership structure, compensation schemes, decision-making process, information flow and budget constraints ect. (refer Chapter 5 for details). These distinctions in governance of VCFs in turn affect how the professional investors manage and monitor the portfolio companies ex-post in general and, stage financing strategy in particular.

Another alternative explanation is related to the interpretation on the positive relationship seen between the performance of the venture capital backed company and the number of venture financing rounds and the total investment. It might be argued that the positive relationship does not necessarily mean that better performed companies attract further rounds of venture capital investment whereas the bad projects are terminated by VCs; rather, it might be other way around, i.e. the better performance is driven by more rounds of financing and total investment. If there are no information asymmetry problems and uncertainty, the above assumption might make sense. With perfect information, the agency problems are much more easily to control: VCs are able to distinguish whether the project is a good one and decide whether to continue the investment. In this case, sufficient capital may indeed lead to better performance. However, it is well documented that venture capital is associated with very serious information asymmetry problems and uncertainty. In addition, as reported in earlier sections, VCs stated that they take terminating bad projects as the most important reason for staging the capital infusion. It therefore confirms the statistical examinations that suggest better performed companies normally induce

further rounds of investment in stage financing whereas investments in bad projects are withdrawn by VCs.

In summary, while the alternative explanations might explain some of the results, the interviews suggest that the incentives provided to the investment professionals by VCFs under different governance structure indeed have impacts on VCs' stage financing strategy in China. The results from the econometric analysis in this study are therefore consistent with the interviews with VCs and, the predictions derived from firm theory.

8.6 Conclusion and Implications

Combining field interviews, archive analysis, hand-collected data, and systematic econometric analysis, this study provides a first exploratory analysis on how institutions affect VCFs' stage financing in China. The findings are summarized as follows. First, Chinese legal restrictions affect the corporate structure of VCFs in China. Second, the corporate structure of VCFs affects venture capitalists' stage financing strategies; only VCFs under the limited partnership structure deploy stage financing regularly. Third, when stage financing is deployed regularly, it is used to mitigate agency problems as in the United States.

Confirming the interview impressions, econometric evidence suggests that VCFs under limited partnership make more stage financing arrangements than VCFs under the limited company structure. More interestingly, the systematic evidence suggests that intensity of stage financing increases when agency costs are higher, if the investment is made by VCFs under limited partnership. For example, companies with higher R&D intensity or younger companies in their early development stage lead to shorter durations of financing stages. That is, similar to their counterparts in the United States, VCFs under limited partnership in China employ stage financing as a means to control potential agency problems. Additionally, stage financing arrangements are closely correlated with the performance of the companies backed by LPVCFs. Better-performed companies normally gain larger number of financing rounds and more capital. That is, similar to their counter parts in the US, VCFs under

limited partnership in China employ stage financing as a means to control potential agency problems and uncertainties.

By contrast, however, the evidence also indicates that for Chinese VCFs structured as limited companies, there is no relationship between agency problems and stage financing strategy. These two groups of contrasting evidences suggest that venture capitalists' stage financing strategies depend on the corporate governance of VCFs.

This study not only contributes to the existing literature on venture capital investment and R&D financing, but also contributes to the literature on institutions. Above all, this study provides empirical evidence on VCs' stage financing strategy in China, which enriches the existing research on stage financing in venture capital investment. In addition, to my knowledge, this discovery on the impacts of corporate structure on stage financing is the first of this kind not only for studies on China's venture investment but also in the general literature of venture capital. At the same time, this research also addresses some general issues on institutions. The impact of institutions on investment activities has attracted extensive interests in the literature. Cross-country study is a major approach used in the literature. However, this approach has been challenged due to the endogeneity problems associated with the approach. By investigating different corporate structures in the same country and in the same industry, a specific mechanism is identified through which institutions exert impacts. This study thus contributes to the literature with a 'natural experiment' approach to study impacts of institutions.

Finally, this study may also have implications to policymaking and business practice. The Chinese government has made many efforts on promoting venture capital investment. This empirical assessment on how public policies affect VCs' investment activities in China may help policymakers to adjust the regulations accordingly. For example, this study suggests that the regulative restrictions on corporate governance may limit the capability of domestic VCFs to provide enough incentives to their investment professionals. Consequently, domestic VCs are discouraged being responsible enough in ex-post project monitoring, which is

suggested to be ultimately important mechanism in venture financing. This empirical evidence may therefore remind the government reconsidering the related regulations in order to build a friendlier environment for venture capital investment. Regarding the business practice, for entrepreneurs who have gained or are seeking for venture capital investment, this empirical assessment confirm that VCs not only provide capital, but also actively involve in management and governance of the portfolio companies. Under this governance framework, ultimately, the capital is contingent to the performance of the projects. Recognizing this side of venture financing is very important for entrepreneurs, especially entrepreneurs in China, who are not very much familiar with this innovative financing instrument. Finally, this study also provides venture capitalists a general picture on how their competitors or potential collaborators operate under the institutions in China. Moreover, by empirically identifying the relationship between governance of venture capital funds and VCs' ex-post monitoring incentives, this research may provide practitioners useful information on how to improve the governance and business performance of the VCFs in general.

Chapter 9 Conclusion and Implications

9.1 Summary of this Study

This thesis explores the institutions of venture capital investment and the impacts of these institutions on venture capitalists' investment strategies in China. It documents and analyses the institutional environments and arrangements related to venture capital investment in China together with an analysis on the development of China's venture capital industry firstly. This study then examines whether these institutions affect VCs' investment strategies in China; and, if the answer is yes, how these institutions impact VCs' investment in China. The impacts of institutions on VCs' investment activities are examined through three aspects: i.e. VCs' investment preferences in terms of the technology and development stage of their portfolio companies, VCs' ex-ante project screening criteria and VCs' stage financing strategies.

Both intensive field research and econometric analysis were employed by the researcher to achieve these research objectives. Over 50 unstructured and semi-structured interviews with venture capitalists, entrepreneurs, researchers, and government officials were conducted in China. From the interviews with government officials and secondary document analysis, detailed information on institutional trajectory related to venture capital industry was obtained. The interviews with venture capitalists and entrepreneurs provided first hand information on the governance of venture capital firms and venture capitalists' investment strategies in China. Specific research questions for quantitative examinations were then derived from the analysis on these interviews and secondary documents, and, the understanding in the existing literature.

Detailed investment information on over 800 venture capital backed companies, which were backed by over 160 VCFs, was gathered to test the assumptions. Secondary document analysis, interviews, and commercial databases were the major sources for these quantitative data. The data cover about one third of all venture capital backed deals in China. Combining both qualitative and quantitative

approaches, this study provides insightful and systematic information on the institutions of the venture capital investment in China, the operation and governance of the venture capital firms and the investment strategies of the venture capitalists. To the best of the author's knowledge, the data are unique in studies on China's venture capital investment.

This study reveals that institutional environments and arrangements for venture capital investment in China differ from those in developed countries. Under the unique institutions, venture capitalists in China share both similarities and differences with their peers in the US and other western countries in terms of the investment preferences, ex-ante project screening criteria, ex-post monitoring, and stage financing activities. At the same time, venture capitalists behave differently in their investment in China depending on the governance structure of the venture capital firms. The research questions, research methods and the major findings of the major analysis chapters, i.e. Chapter 5, 6, 7 and 8 are summarized in Table 9.1.

9.1.1 Institutions of the Venture Capital Industry in China

The study shows that China has weak regulatory institutions. Protection of property rights is considered critical for finance and entrepreneurship and, consequently, venture capital investment (Acemoglu and Johnson, 2005). However, the protection of property rights is weak in China. Chinese Company Law did not allow limited partnership as an organizational structure until June 2007. Furthermore, convertible security and preferred security were not allowed until 2005. The Chinese capital control regime implies that foreign institutional investors are not allowed to raise funds in China unless they register as qualified foreign investment institutions. However, the threshold of these requirements is too high for most FVCFs. It is also well-documented that China's stock market is underdeveloped; the protection of intellectual property rights remains weak; the role of government is unclear; and law enforcement is not efficient.

Normative institutions and cognitive institutions are also different in China. The lack of professional business intermediations, the non-standard accounting and

auditing system, and the shortage of professionals in banking and finance with market economy experience are among the most visible issues in normative institutions in China. As for cognitive aspects, Chinese society heavily emphasizes networking (*Guanxi*), face value (*Mianzi*), and trust (*Chengxin*).

Institutions, especially legal restrictions, have strong implications on the corporate governance and operation of venture capital firms in China. Above all, the corporate structures of the VCFs operating in China are divided into two distinct groups. This structural divide is closely associated with different regulatory requirements imposed on foreign venture capital firms and domestic venture capital funds. Concerning corporate structure, almost all DVCFs are structured as limited companies in China, whereas most FVCFs are structured as limited partnerships. In China, most DVCFs are established as state-owned subsidiaries or spin-offs of large corporations or prestigious universities; FVCFs in China normally incorporate overseas and raise funds from international markets to avoid restrictions on corporate governance and fundraising. Fund sources for most FVCFs are therefore similar to those in the United States (i.e. pension funds, insurance funds, university endowments, large corporations, and wealthy individuals).

Incentive schemes provided by the different types of VCFs to their investment professionals, the information flow and decision-making process, and the degree of budget constraints of the two types of VCFs also differ. According to the interviews, under the control of their parent companies or higher-level supervisory organizations, VCFs structured as limited companies are typically organized hierarchically. Investment professionals take limited liability with lower incentives. In contrast, the governance and the decision-making process are much more independent in VCFs under limited partnerships. The investment professionals take unlimited liability with high-powered incentives. In addition, the VCFs under limited partnerships face harder budget constraints than VCFs structured as limited companies.

In general, according to the interviews, the operation and governance of LPVCFs in China are similar to that of the United States, which are well-documented

in the existing literature. As for LCVCFs, the governance and operation are considerably different.

9.1.2 VCs' Investment Strategies in China

This study further explores VCs' investment strategies and the interaction between VCs' investment strategies and the unique institutions in China by comparing VCs' investment activities in China with those in the United States and other western countries, and, among the different groups of VCFs within China. VCs' investment preferences, ex-ante project screening and ex-post monitoring activities are discussed respectively.

First, VCs' investment preferences are analyzed. Examining venture capitalists' investment preferences in development stages and R&D intensity, the results show that, similar to the practice in the United States, venture capital investment supports R&D-oriented companies in China. Over 70 per cent venture capital deals are in the high-technology industry. About 90 per cent venture capital deals were at in the early or expansion stages at the time of financing by venture capital investment. However, the investment preferences of VCFs are different within China. The statistical analysis of 628 venture capital investment deals made by 86 VCFs shows that the distinctions on the corporate governance structure is the major factor contributing to the difference in venture capitalists' investment preferences in China. VCFs under limited partnership invest more in younger companies and companies with higher R&D intensity than VCFs structured as limited companies. In addition, VCFs, which invest more in early-staged projects, pay more attention to the proprietary of the products in China. Moreover, similar to the US practice, the business background of the VCF impacts venture capitalists' investment choices in China. For example, VCFs from California and Massachusetts are more interested in early-staged projects in China. However, the analysis shows that that resource constraints and cost considerations, which are among the most evidenced factors that affect venture capitalists' investment preferences in the United States, do not seem to

matter in venture capitalists' investment choices in development stage and industry of their portfolio companies in China.

Second, this study further explores how VCs control the potential agency problems and uncertainty involved in venture capital investment after the assessments of VCs' investment preferences. VCs' ex-ante project screening and ex-post monitoring activities in China are examined with the focus on the project screening criteria and stage financing arrangements respectively.

Combining the unstructured and semi-structured interviews with the 37 venture capitalists from 34 VCFs, this study identifies 38 different project screening criteria used by venture capitalists in China. Seven categories of project screening criteria are classified: entrepreneur's personality; entrepreneur's experience; management team; characteristics of the product/service; characteristics of the market; geographical aspects; and financial considerations. The exploration shows that venture capitalists in China share many similarities with their peers in the United States and other western countries in terms of project screening criteria. Primarily, all the screening criteria, which are recognized by VCs in the US, are also considered as major concerns VCs in China. Moreover, similar to their counterparts in the United States and other developed countries, VCs in China also consider the characteristics of the entrepreneur as the utmost important factor that impacts their ex-ante project screening. However, the analysis reports that VCs in China are more demanding than their peers in developed countries and impose more screening criteria. Besides the six categories of screening criteria identified by VCs in the United States, VCs in China add one more category of consideration in project screening, i.e. the geographical factors. In particular, VCs in China pay more attention to whether the local public policies and regulations are friendly to venture financing and entrepreneurship, and, whether the supply of human capital is sufficient. Moreover, VCs in China also add some other extra screening criteria in China such as the entrepreneur's honesty, social network, overseas working and educational experience, and the size of the targeted market etc. Finally, comparing the project screening criteria employed by VCs within China, this study shows that the corporate governance structure of VCFs has strong

impact on VCs' project screening. LPVCFs, which are more risk-taking by investing more in younger and more R&D intensive companies, are more demanding in project screening than LCVCFs. Thirteen screening criteria are considered as important factors for project screening by LPVCFs whereas only nine for LCVCFs. In addition, LPVCFs seem to be more profit-driven by giving more weights to the market and financial aspects of the projects than LCVCFs. Moreover, LPVCFs are more concerned with the institutional factors such as the regulation of the local governments and the supply of human capital etc. than LCVCFs. By contrast, LCVCFs pay more attention to the technological factors of the projects than LPVCFs.

Furthermore, examining venture capitalists ex-post monitoring activities in China through the lens of stage financing arrangements, this study finds that VCs' ex-post monitoring strategy depends a lot on the corporate governance structure of the VCF. VCFs under limited partnership make much more stage financing arrangements than VCFs structured as limited companies. More importantly, the stage financing arrangements are associated the agency costs and uncertainty only for the deals backed by LPVCFs. For example, LPVCFs evaluate the companies with higher R&D intensity of companies at earlier stages more frequently by shortening the duration between financing rounds. In addition, the performance of the companies backed by LPVCFs is significantly and positively associated with a larger number of total financing rounds and financing size. All the above mentioned observations with VCFs under limited partnership are similar to the discoveries in the United States, where the limited partnership is a dominant organizational form for venture capital firms. By contrast, however, this study shows LCVCFs seldom stage the capital infusion in China. Moreover, for these Chinese VCFs structured as limited companies, there is no relationship between agency problems and VCs' stage financing strategy. These two groups of contrasting evidences on VCs' stage financing strategies suggest that VCs' the corporate governance structure of VCFs has significant impacts on VCs' ex-post monitoring activities in China.

Table 9.1 Summary of the Major Analysis Chapters

	Chapter 5	Chapter 6	Chapter7	Chapter8
Title	Development of Venture Capital Investment and Institutions in China	Venture Capitalists' Investment Preferences in China	Venture Capitalists' Project Screening Strategies in China	Venture Capitalists' Ex-post Monitoring and Stage Financing Strategies in China
Questions	<ol style="list-style-type: none"> 1. How is venture capital investment developed in China? 2. What are the major institutional elements related to venture capital investment in China? 3. What are the institutions potentially imply to venture capital investment in China? 	<ol style="list-style-type: none"> 1. What are VCs' investment preferences in China in stage and technology? 2. Whether and how do institutions impact on VCs' investment preferences in China? 	<ol style="list-style-type: none"> 1. What are the major ex-ante project screening criteria employed by VCs? 2. Whether and how do institutions affect VCs' project screening criteria in China? 	<ol style="list-style-type: none"> 1. How do institutions affect VCs' stage financing activities? 2. Does the agency problems between VCs and entrepreneurs affect VCs' stage financing arrangements? 3. Does the agency relationship between VCs and the ultimate fund investors have impacts on VCs' stage financing activities?
Theoretical base	New institutional economics	<ol style="list-style-type: none"> 1. Portfolio methodology 2. Agency theory 	<ol style="list-style-type: none"> 1. Theory of information asymmetry 2. New institutional economics 	<ol style="list-style-type: none"> 1. Theory of information asymmetry 2. Agency theory
Research design	Combination of qualitative and quantitative empirical approaches	Combination of qualitative and quantitative empirical approaches	Combination of qualitative and quantitative empirical approaches	Combination of qualitative and quantitative empirical approaches
Samples	<ol style="list-style-type: none"> 1. Two government officers 2. Two researchers 3. Four entrepreneurs 4. 37 VCs from 34 VCFs 	<ol style="list-style-type: none"> 1. 37 VCs from 34 VCFs; 2. Four entrepreneurs; 3. 628 venture financing deals made by 86 VCFs 	<ol style="list-style-type: none"> 1. 37 VCs from 34 VCFs; 2. Four entrepreneurs; 	<ol style="list-style-type: none"> 1. 37 VCs from 34 VCFs; 2. Four entrepreneurs; 3. 436 venture capital backed companies
Key methods	<ol style="list-style-type: none"> 1. Interview descriptions; 2. Secondary document analysis 	<ol style="list-style-type: none"> 1. Interview descriptions; 2. Descriptive quantitative analysis; 3. OLS regressions 	<ol style="list-style-type: none"> 1. Interview descriptions; 2. Descriptive quantitative analysis; 3. Factor analysis 	<ol style="list-style-type: none"> 1. Interview descriptions; 2. Descriptive quantitative analysis; 3. Cox regressions; OLS regressions; Poisson regressions.

Data sources	<ol style="list-style-type: none"> 1. Interviews 2. Secondary documents 	<ol style="list-style-type: none"> 1. Interviews 2. ‘VentureEconomics’ 3. Secondary documents 4. ‘Survey for Large and Medium sized Industrial Enterprises in China’ 	<ol style="list-style-type: none"> 1. Interviews 2. Secondary documents 	<ol style="list-style-type: none"> 1. Interviews 2. ‘VentureEconomics’ 3. Secondary documents 4. ‘Survey for Large and Medium sized Industrial Enterprises in China’
Key findings	<ol style="list-style-type: none"> 1. The development of China’s venture capital industry is path-dependent. 2. Legal and financing institutions are extremely weak in China. 3. VCFs are divided into groups in organizational structure due to the legal restrictions. LPVCFs are more decentralized in management and providing higher-powered incentives to investment professionals like their peers in the US. LCVCFs are more centralized and providing lower-powered incentives. 	<ol style="list-style-type: none"> 1. Venture capital is concentrated in early-staged and R&D intensive companies in China that is similar to the US practice. 2. VCFs are different in investment preferences in stage and technology of portfolio companies. 3. Regulatory institutions have visible impacts on VC’s investment focuses. The impacts are more alongside with the line of the corporate governance structure of VCFs. LCVCFs are more risk moderate than LPVCFs by investing more in older companies with lower technological intensity. 	<ol style="list-style-type: none"> 1. Similar to the US practice, the human capital, market, product, and financial elements of the projects are also emphasize by VCs in China. 2. The institutions indeed have impacts on ex-ante screening. That is, VCs are more demanding in project screening in China under the weak regulatory institutions 3. LPVCFs are more demanding in project screening than LCVCFs and paying more attention to the institutional, financial and human capital elements than LCVCFs. LCVCFs pay more attention to the technology aspects. 	<ol style="list-style-type: none"> 1. Institutions, especially the rules on corporate governance, have significant impacts on VCs’ ex-post monitoring activities in China. 2. The stage financing activities of LPVCFs in China are similar to those in the US. They stage capital infusion frequently. In addition, the impacts of the agency issues between VCs and entrepreneurs and the performance of the projects on stage financing are only seen with the projects backed by LPVCFs. 3. LCVCFs seldom stage capital infusion. In addition, there is no visible regularity associated with their stage financing arrangements.

9.2 Discussions

The empirical discoveries summarized in the earlier section suggest that institutions and agency perspectives have strong impacts on venture capital investment in China. In general, these findings are consistent with the existing literature on new institutional economics and venture capital investment. However, different from the most widely the impacts of regulatory institutions on venture capital investment are not alongside with the line of protection of property rights; rather, the rules on corporate governance have stronger power in explaining VCs' investment in China. In addition, expanding the existing literature on venture capital investment, this study empirically confirms that the 'double-sided' agency problems are important in understanding venture financing.

9.2.1 The Impact of Institutions on VCs' Investment Activities in China

Primarily, this study shows that the regulatory institutional environments contribute to the differences in the corporate governance of VCFs. As discussed, VCFs in China are divided into two distinctive groups in term of the organizational structure. This divide is caused by the legal restrictions on corporate governance and restrictive regulations on registration as a QFII in China. New institutional economics argues that that business behaviour is affected by institutional arrangements, i.e. the agreements made by specific individuals to govern their own relationships (Williamson, 1979; Milgrom and Robert, 1992). In particular, firms under different governance structure provide different incentives to the business actors, and in turn affect individuals' business behaviours and performance. It suggests that under a more decentralized and market structure framework, transactions take place through a more market-oriented system. Market prices provide actors strong incentives for exploiting profit opportunities and quickly adapting to changing circumstances. By contrast, under a more centralized and hierarchical structure, in which trading parties are under unified ownership and control, the firms offer managers weaker incentives to

maximize profits and thus incur additional bureaucratic costs (Williamson, 1986; Milgrom and Roberts, 1992).

Confirming the above arguments of new institutional economics, this study indeed finds that the organizational structure substantially affects the governance and operation of a firm. For instance, the compensation schemes, decision-making process, and information flow and budget constraints of the VCFs under different organizational structure are visibly different in China. That is, VCFs under limited partnership is more decentralized in governance, providing higher-powered incentives to their investment professionals. By contrast, VCFs structured as limited companies, which are more centralized organizations, provide lower-powered incentives to their investment professionals.

More importantly, the discoveries of this study provide further evidence that the corporate governance structure of VCFs have strong power in explaining VCs' investment strategies in China. That is, VCFs under different governance structure behave differently in investment in China. Overall, the findings suggest that VCFs under limited partnership encourage the investment professionals to take higher risks for higher returns exert more efforts in mitigating the potential agency problems and uncertainty both ex-ante and ex-post than the VCFs structured as limited companies in China. For instance, VCFs under a limited partnership are more risk-taking than those under a more hierarchical structure by investing more in younger and more R&D-oriented companies. Also, the VCFs under limited partnership are more demanding in their project screening and more involved in ex-post monitoring activities, such as stage financing in China. It is also very interesting to notice that, the investment strategies of VCFs under limited partnership in China share visible commonalities with those of the United States, where the limited partnership is the dominant organizational form for venture capital firms. These discoveries again confirm the predictions of on new institutional economics that the different incentives provided by different organizations may substantially influence on the way of the business actors exerting efforts and reacting to risks.

Besides, this study indicates that some other regulatory institutions also contribute to VCs' investment activities in China. Above all, it suggests that the overall weak legal and financial systems in China have visible impacts on VCs' ex-ante project screening. As the interviews show that VCs in China identified more project screening criteria in China. Most of the extra criteria are those related to the concerns of the lack of protection of contracts and weak enforcement of laws. For instance, besides the commonly recognized screening criteria in the West, VCs in China place great emphasis on the honesty and social networks of the entrepreneur. According to the interviews, VCs try to take the self-discipline of the entrepreneur to overcome the lack of legal protection for institutional financiers and the weak law enforcement. Moreover this study confirms the arguments of Johnston (1997) by suggesting that the social networks of the entrepreneur works as a complement to the contract law or serve as a kind of a surrogate market system due to ill-defined property rights, economic roles, and a restricted flow of information.

Additionally, VCs in China pay much more attention to the geographical location of the projects due to the concerns about the public policies of local governments and the supply of human resources in different areas. This finding confirms that existing literature that suggest the decentralization of China's governance and the great regional diversity in China have significant impacts on individuals' business behaviours and regional development (Gerald, Qian and Xu, 2006).

At the same time, the positive relationship between VCs' investment in early-staged projects and the proprietary of products indicates that the protection on intellectual property rights may also affect VCs' investment preferences. This finding is consistent with the existing literature that emphasizing the impact of protection of intellectual property rights on R&D financing.

Furthermore, this study also suggests that the macroeconomic environment is seen as a major concern by venture capitalists in China. For instance, VCs in China pay more attention to the market aspects of the projects in ex-ante screening than their peers in the United States and other countries. In particular, the market size and the

market acceptance of the products are especially emphasized that suggests that the large market is the particularly seen as an attraction for VCs to invest in China.

It is interesting to notice that while the regulatory institutions are shown as important factors that explain venture capital investment in China, the empirical evidence from this study show that normative and cognitive institutions do not seem to have visible impacts on VCs' investment preferences, ex-ante project screening and stage financing in China. The social culture of China has been widely believed to have influential impacts on individuals' business behaviours in this country. In particular, the Confucianism, which places high value on social networks (*Guanxi*), social capital (*Face--Mianzi*), and trust among are emphasized a lot by researchers friends (Ford, 1997; Graham and Lam, 2003). However, these arguments do not seem to have strong predicting power in understanding VCs' investment activities in China. There are some potential explanations for this phenomenon. Firstly, the concept of venture capital investment is newly transferred from the United States to China. As a matter of fact, almost all nations try to duplicate the 'Silicon Valley Model'. The local culture may therefore not as much interwoven with venture capital financing as in other traditional business. Secondly, according to the interviews, the majority of VCs and the entrepreneurs for venture capital targeted projects are young and highly educated. In particular, over 80 per cent VCs and about 50 per cent entrepreneurs once studied and worked in the United States and other western countries. They have been exposed to standard western education and involved much in western world; the impact of traditional culture might be diluted during the process. Thirdly, venture capitalists, as private equity investors, are specialized financial professionals that they are trained to be more rational in decision-making. This element may also weaken the impacts of social culture on venture financing.

In general, this study supports the arguments of new institutional economics, which suggest institutions have strong impacts on individuals' business behaviours and performance. With an insightful empirical analysis on venture capital investment in China, this study suggests that regulatory institutions, especially the regulations on corporate governance and the restrictive rules on foreign institutional investors have

significant impacts on the governance structure of VCFs. The corporate governance structure of VCFs in turn affects VCs' investment activities in China. That is, VCFs under limited partnership behave similarly to those under the same governance structure in the United States, whereas VCFs under the limited company structure behave differently from either the VCFs under limited partnership in China or their peers in the United States. This study therefore implicitly implies that institutions impact venture capitalists' investment strategies mainly through the channel of the corporate governance structure of VCFs in China.

9.2.2 The Impact of Agency Problems on Venture Capital Investment

Consistent with the existing literature on venture capital investment, this study suggests that agency theory also has strong power to explain venture capital investment in China like the practice in the United States.

The agency perspective is generally considered as the most important theory to understand the mechanisms of venture capital investment in the existing literature. In general, there are two sets of agency relationships involved, i.e. the relationship between the venture capitalist and the ultimate investors of venture capital funds and, the relationship between the venture capitalist and the entrepreneur. It is well documented that venture capital investment encounters severe information asymmetric problems and high level of uncertainty that determine the agency problems are more serious than traditional institutional investment means. As discussed, venture capital investment is highly specialised that the ultimate investors of the venture capital funds are not able to fully observe how many efforts the venture capitalist exerts and how well the funds are managed whilst the venture capitalist has much more and better information. At the same time, there are also severe information asymmetries between venture capitalists and the entrepreneurs they back. That is, it is very hard for venture capitalists to fully observe and verify the efforts made by the entrepreneurs and the performance of the projects. Due to the serious and complicated agency problems involved in venture financing, most of the existing literature focuses

on the mechanisms employed in venture capital investment to deal with these agency problems.

This study shows that both sets of agency issues may affect VCs' investment activities. In particular, the argument of the 'double-sided' agency issues is especially helpful in interpreting the distinctions in investment strategies between VCFs under different corporate governance structures. As discussed in the foregoing text, the incentives provided to investment professionals by different VCFs are diverse. At the same time, the risk-taking capability, the efforts exerted in project screening and ex-post monitoring activities and the sensitivity to profits of the investment professionals are distinctive depending on the corporate governance structure of the VCFs. These evidences show that besides the agency issues between the entrepreneurs and VCs, the agency issues between VCs and the ultimate investors of the venture funds also have strong impacts on VCs' investment activities. It confirms that how the ultimate fund investors provide incentives to VCs directly affect the how VCs govern the investments in the growing entrepreneurial firms.

In addition, the empirical evidence in this study suggests that the agency perspective is very helpful in understanding the commonalities of VCs' investment strategies in China with those in the United States and other Western countries. This study finds that consistent with the existing literature, VCs not only provide capital to entrepreneurs, but also exert many efforts in ex-ante evaluation and ex-post monitoring activities in China to control potential agency costs (Gompers and Lerner, 1999). For example, similar to their peers in the United States, VCs in China examine many aspects of a proposal before further evaluation. More interestingly, the screening criteria employed by venture capitalists in China, both foreign and domestic, share many similarities to those used in the United States. Moreover, similar to the US practice, for sectors where agency problems are more severe, stage financing is used more frequently. These findings indicate the concerns for agency problems associated with the potential portfolio companies indeed affect venture capitalists' investment activities in China that is consistent with the previous literature.

In summary, the empirical investigations report that venture capitalists in China display both similarities and differences in their investment behaviours compared to their peers in the United States. It suggests that institutions, especially regulatory institutions indeed affect venture capital investment in China. First, regulatory institutions restrict the corporate governance structures of venture capital firms. The corporate governance structure further influences venture capitalists' investment activities. It therefore implicitly suggests that institutions impact venture capitalists' investment preferences mainly through the channel of the corporate governance structure of VCFs. In addition, this study suggest that the agency perspective is also capable to explain venture capital investment in China that is consistent with the majority existing literature on venture capital investment based on the observations in Western countries.

Overall, this study contributes to the existing literature on venture capital investment and R&D financing, and, to the literature on institutions. Above all, this study provides empirical evidence on institutions of venture capital investment and VCs' investment strategies in China based on a large number of samples and in-depth explorations. It provides a thorough assessment on VCs' investment focuses, project screening and ex-post monitoring activities in China that is useful for further comparative research. In addition, to the researcher's knowledge, this discovery on the impacts of corporate structure on stage financing is the first of this kind not only for studies on China's venture investment but also in the general literature of venture capital. It is thus among the first empirical studies addressing the interaction between the two sets of agency relationship in venture financing. Although the 'double-sided' agency problems have been identified and emphasized by many researchers, the existing literature is mainly focused on the agency issues between VCs and entrepreneurs. Moreover, the few studies, which addressed the agency issues between VCs and the ultimate fund investors, seldom pay attention to how the 'VC-fund investor' relationship may affect the governance of 'VC-entrepreneur' relationship. This study therefore fills up this knowledge gap by providing an analysis on the interaction between these two sets of agency relationships.

Moreover, this research also addresses some general issues on institutions. As stated, the role of institutions playing on investment activities has long been debating. Cross-country studies are a major approach used in the existing empirical literature on institutions. However, this approach has been challenged due to the endogeneity problems since many cross country factors could not be controlled. By investigating investment activities of VCFs under different corporate structures within one country and one industry, this study tries to identify the specific mechanism through which institutions exert influence. This study thus contributes to the existing literature with an implicit ‘natural experiment’ approach to study the impact of institutions.

9.2.3 Limitations of this Study

Although the research results of this study has explored venture capital investment in China and provided a comprehensive understanding on the interaction between institutions and venture financing in China that enriched the existing literature on both institutions and venture capital investment, the constraints of this study should not be ignored.

Primarily, although the ‘triangulation’ method, which combines both qualitative and quantitative approaches, used in this study allows the researcher to improve and secure the reliability and validity of this study, the data collected are potentially liable to biased results. The samples of the interviews, which were selected by convenience and snowball sampling methods, might be challenged for its lack capability to represent the population. This weakness is especially seen with the investigation on VCs’ project screening criteria, which is mainly based on interviews. The sampling issues also exist with the quantitative data. As stated, the researcher combines two subsets of data from different sources, i.e. one is from the commercial database, and the other one is gathered by the researcher from secondary document. For the data collected from secondary document by the researcher, the samples were again mainly chosen by accessibility rather than pre-set systematic sampling strategies due to the difficulties to gain sufficient data. At the same time, the compatibility of these two subsets of database might also by challenged though the researcher have

made many efforts to duplicate the data collection methods of the commercial database during the secondary document analysis to make sure the two datasets are more compatible. Moreover, there are potential researcher biases in this study. The researcher once worked in a venture capital backed company that might lead to more researcher reflexivity due to the personal involvements of the researcher with the research subjects. Besides, given the time constraints and the difficulties in accessing to the research subjects, some issues could not be discussed thoroughly. Extending the empirical base to include more samples with more strategic sampling methods would allow greater confidence in the research results and allow more generalised results.

In addition, while the analysis of this study has substantially improved our understandings in venture capital in China, the explanations for the research results might be challenged. As stated, the major finding of this study is the impact of corporate governance structure of VCFs on venture capitalists' investment activities. However, since the accurate data on the organizational structure of VCFs are not available, this study takes the origin of the VCF (i.e. whether the VCF is a domestic one or a foreign one) as a proxy for the corporate governance structure. This might be questioned whether the differences in VCs' investment activities between groups is due to the distinction of VCFs' corporate governance structure or the differences between foreign and domestic firms. Although the interviews with the practitioners suggest that the corporate governance structure of VCFs seem to be more relevant, a further investigation with accurate information on VCFs' corporate governance structure would allow deeper and more convincing understanding in this issue. Some other issues related to the explanations and the validity of the variables also exist in this study.

Moreover, associated with the concerns on the variables and explanations for the analysis, the quantitative analysis shows that some of the R-square values for the regressions analyses are relatively low that may suggest other factors may better explain the dependent variables. However, due to the lack of data in private equity investment, it is almost impossible for researchers to test other possibilities. Low R-

square values are thus commonly seen in studies on venture capital investment. For example, the R-square values of the regression examinations of Mayer et al. (2005) and Gompers (1995), which investigate VCs' investment preferences and stage financing arrangements respectively, are even lower than the R-square values in this study. Due to the data constraints and the aims to make this study comparable with the existing research, it is beyond the researchers' attempt and capability to identify other factors in this study. However, the regressions show that the R-square values substantially increase when the variable on corporate governance structure of the VCF is included into the examinations in both the examination on VCs' investment preferences and stage financing activities. The results therefore confirm the major findings of this study that suggests the corporate governance structure of VCFs has important impacts on VCs' investment strategies.

9.2.4 Further Research

The study on venture capital investment is still immature, both theoretically and empirically. More research, especially empirical analysis, is called for in order to advance our understanding of venture capital investment and the relationship between venture financing and entrepreneurship and institutions.

The first possible research direction is to extend the empirical investigations on venture capital investment in China. As discussed, there is very little knowledge on China's venture capital investment although China's venture capital market is among the most active ones in the world, and, anecdotally, many new high-technology companies were backed by venture capital investment in this country. More studies on the economic impacts of venture capital investment on China's innovation and entrepreneurship, the impact of venture financing on the performance of the venture capital backed companies, the mechanisms used in venture capital investment in China including the investment contracts, the syndicated investment, and the ex-post supporting and monitoring activities etc. are all important topics for further research.

The second potential research direction is to compare venture capital investment with other traditional financing instruments in order to gain more

understanding in the mechanisms of venture capital investment. It has been long suggested that venture capital investment is different from traditional institutional investors in many ways. However, what makes venture financing so unique; why other institutional investors are not able to support the projects, which are associated with more uncertainty and higher profits, like venture capital firms are the fundamental issues for understanding in the underlying of mechanisms of venture financing. It therefore suggests comparative examinations on the governance and investment activities between venture capital institutions and other financial institutions.

The third research direction is to further examine the interactions between mechanisms used in venture financing. As documented in the existing literature, many mechanisms are used in venture financing. However, most of the previous study examines the mechanisms separately that may fail to capture the major mechanisms of venture financing. For example, this study shows there is close relationship between the governance of VCFs and VCs' governance on their portfolio companies. In addition, it also finds that the risk-taking degree of the VCFs is also related to VCs' ex-ante project screening and ex-post monitoring activities. It would be of value to both academic research and business practice if further research could systematically examined the interwoven relationships between the ex-ante evaluations, contracting, stage financing and syndicated investment etc.

The fourth research question centres on exploring how institutions matter venture financing and entrepreneurship. It is normally accepted by researchers that institutions have impacts on business behaviours. However, how the institutions work, what institutions contribute to what kind of business behaviours have been debated. This study finds that the impact of institutions on venture financing in China is mainly alongside the line with the rules on corporate governance that is different from the existing literature emphasizing the impact of property rights. It therefore calls for further examinations focusing on identifying the specific institutional elements on venture financing and entrepreneurship under different circumstance to gain deeper understanding in institutions.

9.3 Implications for Policymaking and Business Practice

As one of the first empirical explorations on venture capital investment in China, this empirical study not only contributes to the existing literature, but also has implications to policymaking and business practice.

In recent years, China has made many efforts to encourage venture capital investment with the expectation to stimulate entrepreneurship, especially R&D entrepreneurship activities. However, without a solid empirical analysis, it is hard to assess how institutional changes work in reality. This study therefore provides policymakers useful information on how these institutions interact with venture capital investment practice based on empirical examinations. Consequently, it provides alternative suggestions on policymaking. In general, this study suggests that although venture capital investment has been developed rapidly in recent years, the weak regulatory institutions might restrict further development of venture capital in China.

Above all, it suggests that the policymakers should improve the rules on corporate governance. As stated, the regulative restrictions on organizational structure in China restrict the choices of domestic VCFs in corporate governance and, consequently limit the incentives these VCFs may provide to their investment professionals. Associated with these limitations, the domestic VCFs, which are all structured as limited companies, are less capable in supporting young and R&D intensive companies than those VCFs under limited partnership. In addition, VCFs structured as limited companies discourage VCs taking responsibilities in ex-ante project screening and ex-post monitoring activities, which are believed as important mechanisms in venture capital financing. These empirical evidences therefore suggest that the policymakers should encourage certain types of VCFs under different circumstances by adjusting the regulatory institutions. As discussed, the limited partnership as an organizational form has just been legally recognized in China since June, 2007. This institutional change may increase the flexibility for the both the domestic and foreign VCFs in the choice of governance and incentive schemes employed in China.

Furthermore, this study suggests the government improving the regulatory restrictions on foreign institutional investors. As discussed, foreign venture capital investment has become the major contributors to China's venture capital market. In addition, China is becoming the most favorite destination for foreign venture funds that more foreign funds are entering into this Market. However, the interviews with practitioners and the analysis on the existing government policies show that foreign investors are encountered many obstacles operating in China including the rigid requirements for registering as a QFII in China, the restrictions on fundraising for foreign investors, the non-convertibility of RMB, etc. These restrictions might discourage the inflow of foreign venture investment in China.

Moreover, this study suggests that the government should improve the protection for intellectual property rights. As discussed, the Chinese government has promoted venture capital program for years in order to stimulate investments in newly established companies and high-technology companies. This study shows VCFs, which invest more in early-staged companies pay more attention to the proprietary of the products. It therefore advises that the government should build up a better institutional environment to protect the intellectual property rights and encourage more investments in younger companies.

There are also some other policymaking implications proposed by this study. For example, it suggests that the government strengthening law enforcement to protect the contracting parties of venture capital investment. In addition, the local governments should improve higher education and professional training to improve the human capital supply for young growing enterprise in order to attract more venture capital funds. Moreover, the governments, both the central and local ones, should try to provide a more stable and apparent regulatory environment that the investment activities are protected by a consistent legal and financial system.

Finally, this study also has implications to business practitioner, i.e. the three groups of players in venture capital investment. Primarily, by providing detailed information on the institutions related to venture capital investment in China, this study might help all the business players gain general knowledge on the business

environment in China. Both those who are operating in this market, and, those who wish to enter into this market, may gain thorough understanding in what potential institutional issues they may encounter; what opportunities and threats are associated with this market, and how they may overcome the potential institutional restrictions.

In addition, the insightful examinations on VCs' investment activities in China also provide helpful information to the business practitioners. Venture capitalists, may learn what kind of projects are attractive to their potential and competitors or collaborators; what their potential competitors and collaborators see as risks and advantages related to this market; and, how they organize the ex-post monitoring activities etc from this empirical study. This information may help VCs to locate their own market positions, recognize the potential weakness and strengths they have compared to their competitors, and, figure out who might be their potential collaborators in this market. This study also has implications to the ultimate investors of venture capital funds. With the empirical evidence on the governance of the venture capital funds and its impacts on VCs' investment activities and investment performance, this study provides the investors of venture capital funds some helpful information on how to structure the relationship between VCs and themselves and, consequently reduce the potential agency costs.

Moreover, this study also contributes to the business practice of entrepreneurs. Venture capital investment is still very new in China. The interviews with entrepreneurs and VCs show that the founders of start-up companies are seriously lack of knowledge on venture capital investment. This study may therefore provide these entrepreneurs empirical knowledge and direct evidence on what venture capital investment by nature is and how venture capital investment operates in China. The entrepreneurs may gain useful information on what kind of VCFs may have interests in their projects from the analysis on VCs' investment preferences. In addition, the analyses on ex-ante project screening provide detailed information on the key issues VCs are concerned. It therefore reminds the entrepreneurs what points should be addressed with more attention in the project proposal. More importantly, the analysis on stage financing suggests the entrepreneurs being aware that venture capital is not

just capital, it is associated with deep involvements and monitoring activities from VCs. And, the capital infusion is closely related to the performance of the projects. It further suggests entrepreneurs seriously considering how far the project may go and how well the project will do before seeking for venture capital investment. In addition, it also reminds the entrepreneurs that they have to lose some control of their own companies for the capital they gain.

Bibliography

1. Acemoglu, D. and Johnson. S., 2005, 'Unbundling Institutions', *Journal of Political Economy*, vol. 113: 949-995.
2. Admati A.R. and Pfleiderer P., 1994, 'Robust Financial Contracting and the Role of Venture Capitalists', *Journal of Finance*, vol.49, 2:371-402.
3. Aghion, P. and Bolton, P., 1992, 'An Incomplete Contracts Approach to Financial Contracting', *Review of Economic Studies*, vol. 59:473-494.
4. Ahgion, P. and Howwit, 1997, 'Endogenous Growth Theory', Boston, MA: The MIT Press.
5. Aghion, P. and Tirole, J., 1997, 'Formal and Real Authority in Organizations," *Journal of Political Economy*, vol. 105, 1: 1-29.
6. Ahlstrom, D. and Bruton, G., 2003, 'An Institutional View of China's Venture Capital Industry: Explaining the Differences Between China and the West', *Journal of Business Venturing*, vol. 18, 1: 233-259.
7. Akerlof, G. A., 1970, 'The Market for 'Lemons': Quality Uncertainty and the Market Mechanism', *The Quarterly Journal of Economics*, vol. 84, 3: 488-500.
8. Akerlof, G. A., 1980, 'A Theory of Social Custom of Which Unemployment May be One Consequence', *The Quarterly Journal of Economics*, vol. 94: 749-775.
9. Alchian, A. A., 1965, 'Some Economics of Property Rights.' *IL Politico*, vol.30: 816-829.
10. Allen, F. and Gale, D., 1999, 'Diversity of Option and Financing of New Technologies', *Journal of Financial Intermediation*, vol. 8: 68-89.
11. Allen, F., Qian, J. and Qian, M., 2005, 'Law, Finance and Economic Growth in China', *Journal of Financial Economics*, vol. 77: 57-116.
12. Armour, H.O. and Teece, D.J., 1980, 'Vertical Integration and Technological Innovation', *Review of Economics and Statistics*, vol. 62: 470-474.
13. Babcock, B., 1980, 'Reflexivity: definitions and discriminations', *Semiotica*, vol.30: 1-14.

14. Baker, M. and Gompers, P., 2000, 'The Determinants of Board Structure and Function in Entrepreneurial Firms', Harvard Business School Working Paper, Cambridge.
15. Barro, R. J., 1991, 'Economic Growth in a Cross Section of Countries', *The Quarterly Journal of Economics*, vol. 106: 407-443.
16. Berelson, B., 1952, 'Content Analysis in Communication Research', Glencoe, Ill.: Free Press.
17. Bergemann, D. and Hege, U., 1998, 'Venture Capital Financing, Moral Hazard, and Learning', *Journal of Banking and Finance*, vol. 22: 703-735.
18. Berle, G. and Means, C., 1932, 'Modern Corporation and Private Property', Harcourt, Brace and World, Inc.
19. Black, B. and Gilson, R., 1998, 'Venture Capital and the Structure of Capital Markets: Bank versus Stock Markets', *Journal of Financial Economics*, vol. 47: 243-277.
20. Bleicher, K. and Paul, H., 1987, 'The External Corporate Venture Capital Fund-- A Valuable Vehicle for Growth', *Long Rang Planning*, vol. 20: 64-70.
21. Bliss, R., 1999, 'A venture capital model for transitioning economies: the case of Poland', *Venture Capital*, vol. 1: 241-257.
22. Bolton, P. and Farrell, J., 1990, 'Decentralization, Duplication, and Delay', *Journal of Political Economy*, vol. 98: 803-26.
23. Bolton, P. and Scharfstein, D. S., 1990, 'A Theory of Predation Based on Agency Problems in Financial Contracting', *American Economic Review*, vol. 80:93-106.
24. Boocock, J.G. and Woods, M., 1997, 'The Evaluation Criteria used by Venture Capitalists: Evidence from a UK Fund', *International Small Business Journal*, vol.16: 36-57.
25. Bottazzi, L., Da Rin, M. and Hellmann, T., 2004, 'Active Financial Intermediation: Evidence on the Role of Organizational Specialization and Human Capital', ECGI - Finance Working Paper No. 49/2004.

26. Braendle, U. C., Gasser, T. and Noll, J., 2005, 'Corporate Governance in China—Is Economic Growth Potential Hindered by *Guanxi*?', *Business and Society Review*, vol.10: 389–405.
27. Brander J.A., Amit R. and Antweiler W., 2002, 'Venture Capital Syndication: Improved Venture Selection versus the Value-added Hypothesis', *Journal of Economics and Management Strategy*, vol.11:423-452.
28. Bruton, G., Ahlstrom, D. and Yeh, K., 2004, 'Understanding Venture Capital in East Asia: The Impact of Institutions on the Industry Today and Tomorrow', *Journal of World Business*, vol. 39: 72-88.
29. Bryman, A., 1988, 'Quantity and Quality in Social Research' London: Unwin Hyman.
30. Bulmer S. J., 1998, 'New institutionalism and the governance of the Single European Market', *Journal of European Public Policy*, vol.5: 365-386.
31. Burgess, R., 1982, 'Field Research: A Source Book and Field Manual', London: Allen and Unwin.
32. Bygrave W., 1987, 'Syndicated Investments by Venture Capital Firms: a Networking Perspective', *Journal of Business Venturing*, vol.2:139-154.
33. Bygrave, W., 1988, 'The Structure of Investment Networks in the Venture Capital Industry', *Journal of Business Venturing*, vol.3: 137-157.
34. Carlin, W. and Mayer, C., 2003, 'Finance, Investment, and Growth', *Journal of Financial Economics*, vol. 69:191-226.
35. Casamatta C., 2003, 'Financing and Advising: Optimal Financial Contracts with Venture Capitalists', *Journal of Finance*, vol.58:2059-2086.
36. Cass, D., 1965, 'Optimum Growth in an Aggregative Model of Capital Accumulation', *The Review of Economic Studies*, vol. 32: 233-240.
37. Chandler, A. D., 1962, 'Strategy and Structure', Boston, MA: MIT Press.
38. Cheung, S. N. S., 1970, 'The structure of Contract and the Theory of a Non-Exclusive Resource', *Journal of Law and Economics*, vol. 13: 49-70.

39. Chu, P., 1996, 'Social Network Models of Overseas Chinese Entrepreneurship: The Experience of Hong Kong and Canada', *Canadian Journal of Administrative Sciences*, vol. 13: 358-65.
40. Churchill, N.C. and Lewis, V., 1983, 'The Five Stages of Small Business Growth', *Harvard Business Review*, vol. 61: 30-50.
41. Cicourel, A.V., 1964, 'Method and Measurement in Sociology', New York, NY: Free Press.
42. Coase, R. H., 1937, 'The Nature of the Firm', *Economica*, vol. 4: 386-405
43. Coase, R. H., 1960, 'The Problem of Social Cost', *Journal of Law and Economics*, vol.3: 1-44.
44. Cochrane, J. H., 2001, 'The Risk and Return of Venture Capital', NBER Working Paper No.8066.
45. Coffman, K. G. and Odlyzko, A. M., 1998, 'The Size and Growth Rate of the Internet'. *First Monday*, vol. 3, 5th October **1998**
46. Comte, A., 1842, 'Cours de Philosophie Positive,' Martineau (tr.), 1896, *The Positive Philosophie*, vol. I, II, and III, London: Bell.
47. Cornelli, F. and Yosha, O, 2003, 'Stage Financing and the Role of Convertible Securities', *Review of Economic Studies*, vol.70: 1-32.
48. Cumming D.J., 2000, 'Robust Financial Contracting among Syndicated Venture Capitalists', *Review of Finance*, vol. 8:75-108.
49. Cumming, D. J. and MacIntosh, J.G., 2003, 'A Cross-Country Comparison of Full and Partial Venture Capital Exits', *Journal of Banking and Finance*, vol. 27:511-548.
50. Cumming, Douglas J. and MacIntosh, J. G., 2003, 'Venture Capital Exits in Canada and the United States', *University of Toronto Law Journal*, vol. 53:101-200.
51. Cumming, D., Fleming, G. and Suchard, J., 2005, 'Venture Capitalists Value-added Activities, Fundraising and Drawdowns', *Journal of Banking and Finance*, vol. 29:295-331.

52. Cumming, D., Fleming, G. and Schwienbacher, A., 2006, 'Legality and Venture Capital Exits', *Journal of Corporate Finance*, vol. 12:214-245.
53. Curtis J. M., 1997, 'The Market for Innovation in the United States and Venture Capital and the Comparative Corporate Governance Debate', *Northwestern University Law Review*, vol.91, No.3.
54. Davis, L. E. and North, D. C., 1971, 'Institutional Change and American Economic Growth' Cambridge: Cambridge University Press.
55. De Clercq, D. and Sapienza, H. J., 2001, 'The Creation of Relational Rents in Venture Capitalist-Entrepreneur Dyads', *Venture capital*, vol.3: 107 -128.
56. Demsetz, H., 1967, 'Towards a Theory of Property Rights', *American Economic Review*, vol. 57: 347-359.
57. Deutscher, I., 'What We Say/What We Do: Sentiments and Acts', Glenview, Ill., Scott, Foresman.
58. Dewatripont, M. and Maskin, E., 1990. 'Contract Renegotiation in Models of Asymmetric Information', *European Economic Review*, vol. 34: 311-321.
59. Dewatripont, M. and Maskin, E., 1995, 'Credit and Efficiency in Centralized and Decentralized Economies', *Review of Economic Studies*, vol. 62:541-55.
60. Diamond, D., 1984, 'Financial Intermediation and Delegated Monitoring', *Review of Economic Study*, vol. 51: 393-414.
61. Diamond, D., 1991, 'Debt Maturity Structure and Liquidity Risk', *The Quarterly Journal of Economics*, vol. 106: 709-37.
62. DiMaggio, P., 1997, 'Culture and Cognition', *Annual Review of Sociology*, vol. 23: 263-287.
63. Durkheim, E., 1938, 'The Rules of Sociological Method', New York: Free Press.
64. Elango, B., Fried, V., Hisrich, R and Polonchek, A., 1995, 'How venture capital firms differ', *Journal of Business Venturing*, vol. 10: 157-179.
65. Ellickson, R. C., 1991, 'Order Without Law: How Neighbors Settle Disputes', Harvard University Press.

66. Fama, E. F., 1980, 'Agency Problems and the Theory of the Firm', *Journal of Political Economy*, vol. 88: 288-307.
67. Farrell D. and Grant, A. J., 2005, 'China's Looming Talent Shortage', *McKinsey Quarterly*, 2005.
68. Feng, Z., 2004, 'Venture Capital Investment in China', PhD thesis, Pardee Rand Graduate School.
69. Fenn, G. W. and Liang, N., 1995, 'The Economics of the Private Equity Market', Board of Governors of the Federal Reserve System.
70. Florida, R. and Kenney, M., 1988, 'Venture Capital and High Technology Entrepreneurship', *Journal of Business Venturing*, vol.3: 301-19.
71. Filstead, W. J. (Eds), 1970, 'Qualitative Methodology: Firsthand Involvement with the Social World', Chicago: Markham.
72. Ford, D. (Eds), 1990, 'Understanding Business Markets: Interaction, Networks and Relationships', London: Academic Press.
73. Fama, E. F. and French, K., 1999, 'The Corporate Cost of Capital and the Return on Corporate Investment', *Journal of Finance*, vol. 54: 1939-1967.
74. Fried, V. H. and Hisrich, R. D., 'Toward a Model of Venture Capital Investment Decision Making', *Financial Management*, vol. 23: 28-37.
75. George, J., Duffy, K. and Ahuja, M., 2000, 'Countering the Anchoring and Adjustment Bias with Decision Support System', *Decision Support System*, vol.29: 195-206.
76. Gilson, R. J. and Schizer, D. M., 2002, 'Understanding Venture Capital. Structure: A Tax Explanation for Convertible Preferred Stock', working paper, Columbia Law School and Stanford Law School.
77. Graham, J. L. and Lam, N.M., 2003, 'The Chinese Negotiation', *Harvard Business Review*, vol. 81; 82-91.
78. Griliches, Z. and Lichtenberg, F., 1984, 'Interindustry Technology Flows and Productivity Growth: A Re-examination', *The Review of Economics and Statistics*, vol. 66: 324-29.

79. Griliches, Z. and Mairesse, J., 1991, 'R&D and Productivity Growth: Comparing Japanese and U.S. Manufacturing Firms', NBER Working Paper No. W1778. April.
80. Goffman, E., 1955, 'On Face Work: An Analysis of Ritual Elements in Social Interaction', *Psychiatry*, vol.18: 213-31.
81. Goldberg, V. and J. Erickson, 1987, 'Quantity and Price. Adjustment in Long-Term Contracts: A Case Study of Petroleum Coke', *Journal of Law and Economics*, vol.30: 369-98.
82. Gompers, P., 1995, 'Optimal Investment, Monitoring, and the Staging of Venture Capital', *Journal of Finance*, vol. 6: 1461-1489.
83. Gompers, P., 1997, 'Venture Capital and the Creation of Public Companies: Do Venture Capitalists Really Bring More than Money?', *Journal of Private Equity*, Fall: 15-32.
84. Gompers, P. and Lerner, J., 1996, 'The Use of Covenants: An Empirical Analysis of Venture Partnership Agreements', *Journal of Law and Economics*, vol. 39: 463-498.
85. Gompers, P. and Lerner, J., 1998, 'Venture Capital Distributions: Short-Run and Long-Run Reactions', *Journal of Finance*, vol. 53:2161-2183.
86. Gompers, P. and Lerner, J., 1999a, 'The Venture Capital Cycle', Boston, MA: MIT Press.
87. Gompers, P. and Lerner, J., 1999b, 'An analysis of compensation in the U.S. venture capital partnership', *Journal of Financial Economics*, vol. 51:3-44.
88. Gompers, P. and Lerner, J., 2000, 'Money chasing deals? The impact of fund inflows on private equity valuation', *Journal of Financial Economics*, vol. 55: 281-325.
89. Gompers, P. and Lerner, J., 2001, 'The Venture Capital Revolution', *Journal of Economic Perspectives*, vol. 15: 145-168.
90. Gompers, P. and Lerner, J., 2003, 'The Really Long-Run Performance of Initial Public Offerings: The Pre-Nasdaq Evidence', *Journal of Finance*, vol. 58: 1355-1392.

91. Gorman, M. and Sahlman, W.A., 1989, 'What do venture capitalists do?', *Journal of Business Venturing*, vol. 4:231-248.
92. Grossman, S. J. and Hart, O., 1986, 'The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration', *Journal of Political Economy*, vol. 94: 691-719.
93. Gupta, A. and Sapienza, H. J., 1992, 'Determinants of Venture Capital Firms' Preferences Regarding the Industry Diversity and Geographic Scope of their Investments', *Journal of Business Venturing*, vol. 7: 347-362.
94. Hall, B., 2002, 'The Financing of Research and Development', NBER working paper No. 8773.
95. Hall, J. and Hofer, C., 1993, 'Venture Capitalists' Decision Criteria in New Venture Evaluation', *Journal of Business Venturing*, vol.8: 25-42.
96. Hart, O., 1988, 'Capital Structure as a Control Mechanism in Corporations', *Canadian Journal of Economics*, Canadian Economics Association, vol. 21: 467-476.
97. Hart, O., 1988, 'Incomplete Contracts and the Theory of the Firm', *Journal of Law, Economics and Organization*, vol. 4: 119-139.
98. Hart, O., 1995, 'Corporate Governance: Some Theory and Implications', *Economic Journal*, vol. 105: 678-689.
99. Hart, O., 1998, 'Firms Contracts and Financial Structure: Clarendon Lectures in Economics', *Journal of Political Economy*, vol. 106:446-451.
100. Hart, O. and Moore, J., 1988, 'Incomplete Contracts and Renegotiation', *Econometrica*, Econometric Society, vol. 56: 755-85.
101. Hart, O. and Moore, J., 1990, 'Property Rights and the Nature of the Firm', *Journal of Political Economy*, vol. 98: 1119-58.
102. Hart, O. and Moore, J., 1990. 'A Theory of Corporate Financial Structure Based on the Seniority of Claims', NBER Working Papers No.3431, National Bureau of Economic Research, Inc.

103. Hart, O. and Moore, J., 1994, 'A Theory of Debt Based on the Inalienability of Human Capital', *The Quarterly Journal of Economics*, vol. 109: 841-79.
104. Hart, O. and Moore, J., 1999, 'Foundations of Incomplete Contracts', *Review of Economic Studies*, vol. 66:115-38.
105. Hellmann, T., 1998. 'The Allocation of Control Rights in Venture Capital Contracts', *RAND Journal of Economics*, vol. 29: 57-76.
106. Hellmann, T., 2002, 'A Theory of Strategic Venture Investing', *Journal of Financial Economics*, vol. 64: 285-314.
107. Hellmann, T. and Puri, M., 2000, 'The Interaction between Product Market and Financing Strategy: The Role of Venture Capital', *Review of Financial Studies*, vol. 13: 959-84.
108. Hellmann, T. and Puri, M., 2002, 'Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence', *Journal of Finance*, vol. 57: 169-199.
109. Hindess, B., 1977, 'Philosophy and Methodology in the Social Sciences', Harvester Press.
110. Holmstrom, B., 1979, 'Moral Hazard and Observability', *Bell Journal of Economics*, vol. 10: 74-91.
111. Holmstrom, B. and Milgrom, P., 1987, 'Aggregation and Linearity in the Provision of Intertemporal Incentives,' *Econometrica*, *Econometric Society*, vol. 55: 303-28.
112. Holmstrom, B. and Tirole, J., 1998, 'Private and Public Supply of Liquidity', *Journal of Political Economy*, Vol. 106: 1-40.
113. Huang, H. and Xu, C., 2003, 'Financial Syndication and R&D', *Economics Letters*, 80:141-146.
114. Hwang, K., 1987, 'Face and Favor: The Chinese Power Game', *The American Journal of Sociology*, vol. 92: 944-974.

115. Jeng, L. and Wells, P., 2000, 'The Determinants of Venture Capital Funding: Evidence Across Countries', *Journal of Corporate Finance*, vol.6: 241-189.
116. Jensen, M. and Meckling, W. H., 1976, 'Theory of Firm: Managerial Behavior, Agency Costs and Ownership Structure', *Journal of Financial Economics*, vol.3: 305-360
117. Jensen, M. C., 1986, 'Agency Costs of Free Cash Flow, Corporate Finance and Takeovers', *American Economic Review*, vol.76: 323-329.
118. Jin, H., Qian, Y. and Weingast, B., 1999, 'Regional Decentralization and Fiscal Incentives: Federalism, Chinese Style', mimeo, Nobel Symposium on Transition, September.
119. Johnston, M., 1997, 'What Can be Done about Entrenched Corruption?', *World Bank Paper Series*.
120. Jones, C. and Williams, J., 1998, 'Measuring the Social Rate of Return to R&D', *Quarterly Journal of Economics*, vol. 113: 119-135.
121. Joskow, P.L, 1985, 'Vertical Integration and Long-term Contracts: The Case of Coal-burning Electric Generating Plants', *Journal of Law, Economics and Organisation*, vol. 1:33-80.
122. Kaplan, S., Frederic M. and Per Strömberg, J., 2003, 'How Do Legal Differences and Learning Affect Financial Contracts?', working paper, university of Chicago.
123. Kaplan, S., Frederic M. and Per Strömberg, J., 2003, 'Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts', *Review of Economic Studies*, vol. 70: 317-41.
124. Kenney, M., Han, K and Tanaka, K., 2004, 'Venture Capital Industries in East Asia', In S. Yusuf, M. Altaf, and K. Nabeshima (Eds.) *Global Change and East Asian Policy Initiatives*, Oxford: Oxford University Press: 391-427.
125. Khan, A.M., 1987, 'Assessing Venture Capital Investments with Non-compensatory Behavioral Decision Models', *Journal of Business Venturing* vol.2: 193-205.

126. King, R. G and Levine, R., 1993, 'Finance, Entrepreneurship and Growth: Theory and Evidence', *Journal of Monetary Economics*, vol. 32: 513-542.
127. Klein, C and Alchian, A. A., 1978, 'Vertical Integration, Appropriable Rents, and the Competitive Contracting Process', *Journal of Law and Economics*, vol. 2: 297-326.
128. Knight, R.M., 1994, 'Criteria Used by Venture Capitalists: A Cross Cultural Analysis', *International Small Business Journal*, vol. 13: 26-37.
129. Kortum, S and Lerner, J., 1998, 'Stronger Protection or Technological Revolution: What is Behind the Recent Surge in Patenting?', *Carnegie-Rochester Conference Series on Public Policy*, vol. 48: 247-304.
130. Kortum, S and Lerner, J., 2000, 'Assessing the Contribution of Venture Capital to Innovation', *RAND Journal of Economics*, vol. 31: 674-692.
131. Kornai, J., 1980, 'Economics of Shortage', Amsterdam: North-Holland.
132. La Porta, R., Lakonishok, J., Shlerifer, A. And Vishny., R., 1997, 'Good News for Value Stocks: Further Evidence on Market Efficiency', *Journal of Finance*, vol. 52: 859-874.
133. La Porta, R., Lopez-de-Silanes, F. and Shleifer, A., 1999, 'Corporate Ownership Around the World', *Journal of Finance*, vol. 54: 471-517.
134. Lazear, E. P., 1986, 'Salaries and Piece Rates', *Journal of Business*, vol. 59: 405-31.
135. Lazear, E. P, 2000, 'Performance Pay and Productivity', *American Economic Review*, vol. 90: 1346-1361.
- 136.
137. Lee, P.M. and Wahal, S., 2002, 'Grandstanding, Certification and the Underpricing of Venture Capital Backed IPOs', Goizueta Business School, University of Atlanta, working paper.
138. Lee, T., Mitchell, T. and Sablynski, C., 1999, 'Qualitative Research in Organizational and Vocational Psychology' , *Journal of Vocational Behavior*, vol. 55: 161-187.

139. Lerner J., 1994, 'The Syndication of investment', *Finance Management*, vol.23:16-27.
140. Lerner, J., 1995, 'Venture Capitalists and the Oversight of Private Firms', *The Journal of Finance*, vol. 50:301-319.
141. Lerner, J., 1999, 'The Government as Venture Capitalist: The Long-Run Impact of the SBIR Program', *Journal of Business*, vol. 72:285-318.
142. Lerner, J., 2002, 'Boom and bust in the venture capital industry and the impact on innovation', *Economic Review*, Federal Reserve Bank of Atlanta, Q4: 25-39.
143. Lerner, J and Antoinette S., 2005, 'Does Legal Enforcement Affect Financial Transactions? The Contractual Channel in Private Equity', *The Quarterly Journal of Economics*, vol. 120: 223-246.
144. Levin, R. C., Klevorick, A. K., Nelson, R. R., Winter, S. G., Gilbert, R. and Griliches, Z., 1987, 'Appropriating the Returns from Industrial Research and Development', *Brookings Papers on Economic Activity*, 1987, vol. 3: 783-831.
145. Lieberthal, K and Oksenberg, M.,1988, 'Policy Making in China: leaders, structures and processes', Princeton, N.J. : Princeton University Press.
146. Lockett A and Wright, M., 2001, 'The Syndication of Venture Capital Investments', *The International Journal of Management Science*, vol. 29:375-390.
147. MacMillan, I., Siegal, R.E., SubbaNarasimba, P.N., 1985, 'Criteria Used by Venture Capitalists to Evaluate New Venture Proposals', *Journal of Business Venturing*, vol. 1:119-28.
148. MacMillan, I.C., Zemann, L., Subba Narasimba, P.N., 1987, 'Criteria Distinguishing Successful from Unsuccessful Ventures in the Venture Screening Process', *Journal of Business Venturing*, vol. 2: 123-137.
149. McMillan, J. S. and Woodruff, C., 1999, 'Property Rights and Finance', *American Economic Review*, vol. 92: 1335–1356.

150. Macneil, I. R., 1974, 'The Many Futures of Contracts', *Southern California Law Review*, vol. 47: 691-816.
151. Manigart S., Sapienza H. J and Vermeir W., 1996, 'Venture Capitalist Governance and Value-added in Four Countries', *Journal of Business Venturing*, vol.11: 439 -469.
152. Manigart, S., Lockett, A., Wright, M., Landström, H., Bruining, H., Desbrières, P. and Hommel, U., 2002, 'Why do European Venture Capital Companies Syndicate?', ERIM Report Series Reference No. ERS-2002-98-ORG.
153. Manigart, S., De Waele K., Wright, M., Robbie, K., Desbrières, P., Sapienza H. J and Beekman, A., 2000, 'Venture Capitalists, Investment Appraisal and Accounting Information: A Comparative Study of the US, UK, France, Belgium and Holland', *European Financial Management*, vol.6: 389 - 403.
154. Mansfield, E., Schwartz, M. and Wagner, S., 1981, 'Imitation Costs and Patents: An Empirical Study', *Economic Journal*, vol. 91: 907–918.
155. Markowitz, H. M., 1952, 'Portfolio Selection', *Journal of Finance*, Vol.7:77-91.
156. Mayer, C., 2002, 'Financing the New Economy: Financial Institutions and Corporate Governance', *Information Economics and Policy*, vol. 14: 311-326.
157. Mayer, C., Schoors, K and Yafeh, Y., 2005, 'Sources of Funds and Investment Activities of Venture Capital Funds: Evidence from Germany, Israel, Japan and the United Kingdom', *Journal of Corporate Finance*, vol. 11: 586-608.
158. Megginson, W.L and Weiss, K.A., 1991. 'Venture Capitalists Certification in Initial Public Offerings', *Journal of Finance*, vol. 46: 879- 903.
159. Milgrom, P and Roberts, J., 1990, 'The Efficiency of Equity in Organizational Decision Processes', *American Economic Review*, vol. 80: 154-159.

160. Muzyka, D., Birely, S and Leleux, B., 1996, 'Trade-offs in the Investment Decision of European Venture Capitalists', *Journal of Business Venturing*, vol. 11: 273-288.
161. Neher, D., 1999, 'Staged Financing: An Agency Perspective', *Review of Economic Studies*, vol. 66: 255-274.
162. North, D., 1990, 'Institutions, Institutional Change and Economic Performance', New York, NY: Cambridge University Press.
163. Park, S.H. and Luo, Y., 2001, 'Guanxi and Organizational Dynamics: Organizational Networking in Chinese Firms', *Strategic Management Journal*, vol. 22: 455-77.
164. Poindexter, J. B., 1976, 'The Efficiency of Financial Markets: The Venture Capital Case', PhD dissertation, New York University.
165. Rajan, R. G and Zingales, L., 2003, 'The Great Reversals: The Politics of Financial Development in the Twentieth Century', *Journal of Financial Economics*, vol. 69: 5-50.
166. Riordan, M and Williamson, O. E., 1985, 'Asset Specificity and Economic Organization', *International Journal of Industrial Organization*, vol. 3:365-78.
167. Romain, A and Bruno, P, 2004, 'The Economic Impact of Venture Capital', Working paper, The Liberal University, Brussels.
168. Romer, P. M., 1986, 'Increasing Returns and Long Run Growth', *Journal of Political Economy*, vol. 94:1002-1037.
169. Rothschild, M and Stiglitz, J. E., 1976, 'Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information', *The Quarterly Journal of Economics*, vol. 90: 630-49.
170. Obrimah, O., 2004, 'Law, Finance, and Venture Capitalists' Asset Allocation Decisions', EFA 2004 Maastricht Meetings Paper No. 4152.
171. Petersen, M. A. and Rajan, R. G., 1995, 'The Effect of Credit Market Competition on Lending Relationships', *The Quarterly Journal of Economics*, vol. 110: 407-443.

172. Pisano, G., 1990, 'The R&D Boundaries of the Firm: An Empirical Analysis', *Administrative Science Quarterly*, vol. 35:153-176.
173. Pistor, K and Xu, C., 2005, 'Governing Stock Markets. in Transition Economies: Lessons from China', *American Law and Economics Review*, vol. 7: 184-210.
174. Polanyi, K., Arensberg, C. M. and Person, H. W., 1957, 'Trade and Market in the Early Empires: Economies in History and Theory', Falcon's Wing Press.
175. Poterba, J. M., 1989, 'Venture Capital and Capital Gains Taxation', NBER Working Paper NO. 2832.
176. Priest, G., 1977, 'The Common Law Process and the Selection of Efficient Rules', *The Journal of Legal Studies*, vol.6:65-82.
177. Qian, Y and Xu, C., 1993, 'The M-form Hierarchy and China's Economic Reform', *European Economic Review*, April.
178. Repullo, R and Suarez, J., 2004, 'Venture Capital Finance: A Security Design Approach', *The Review of Finance*, vol. 8:75-108.
179. Riquelme, H. and Rickards, T., 1992, 'Hybrid Conjoint Analysis: An Estimation Probe in New Venture Directions', *Journal of Business Venturing*, vol. 7: 505-518.
180. Romer, P. M., 1986, 'Increasing Returns and Long-run Growth', *Journal of Political Economy*, vol. 94:1002-37.
181. Ross, S.A., 1977, 'The Determination of Financial Structure: The Incentive-Signaling Approach', *Bell Journal of Economics*, vol. 8:23-40.
182. Ruhnka J. C. and Young J. E., 1987, 'A Venture Capital Model of Development Process for New Ventures', *Journal of Business Venturing*, vol. 2: 167-184.
183. Ruhnka, J. C. and Yong, J. E., 1991, 'Some Hypotheses about Risk in Venture Capital Investing', *Journal of Business Venturing*, vol. 6: 115-133.

184. Sah, R. K and Stiglitz, J. E., 1986, 'The Architecture of Economic Systems: Hierarchies and Poliarchies', *American Economic Review*, vol. 76:716-727.
185. Sahlman, W., 1990, 'The Structure and Governance of Venture Capital Organizations', *Journal of Financial Economics*, vol. 27: 473-524.
186. Sandberg, W.R., Schweiger, D.M. and Hofer, C.W., 1987, 'Determining Venture Capitalists Decision Criteria: The Use of Verbal Protocols', *Frontiers of Entrepreneurship Research*, Babson College.
187. Saxenian, A., 1989a, 'In Search of Power: The Organization of Business Interests in Silicon Valley and Route 128', *Economy and Society*, vol.18: 25-70.
188. Saxenian, A., 1989b, 'The Cheshire Cat's Grin: Innovation, Regional Development and the Cambridge Case', *Economy and Society*, vol.18: 448-477.
189. Saxenian, A., 1990, 'Regional Networks and the Resurgence of Silicon Valley', *California Management Review*, vol. 33: 89-112.
190. Scooter, A., 1981, 'State-of-nature Theory and the Rise of Social Institutions: The Theory of Social Institutions', Cambridge: Cambridge University Press.
191. Scherer, F. M., 1998, 'The Size Distribution of Profits from Innovation', *Annales d'Economie et de Statistique*, vol. 49: 495-516.
192. Schmidt, K. M., 2003, 'Convertible Securities and Venture Capital Finance', *Journal of Finance*, vol. 58:1139-1166.
193. Schumpeter, J., 1942. 'Capitalism, Socialism, and Democracy', New York: Harper and Row (reprinted in 1960).
194. Schwartz, H. and Jacobs, J., 1979, 'Qualitative Sociology', New York: Free Press.
195. Shepherd, D. A., 1999, 'Venture Capitalists' Introspection: A Comparison of 'In Use' and 'Espoused' Decision Policies', *Journal of Small Business Management*, vol. 37: 76-87.

196. Shleifer, A., 1985, 'A Theory of Yardstick Competition', *Rand Journal of Economics*, vol. 16: 319-327.
197. Shleifer, A and Vishny, R., 1992, 'Liquidation Values and Debt Capacity: A Market Equilibrium Approach', *Journal of Finance*, vol. 47: 1343-1366.
198. Silva, J., 2004, 'Venture Capitalists' Decision-making in Small equity Markets: A Case Study Using Participant Observation', *Venture Capital*, vol. 6: 125 – 145.
199. Silverman, A. E., 1989, 'Intellectual Property Law and the Venture Capital Process', *Stanford International Center for Law and Technology and the John M. Olin Program in Law and Economics*.
200. Silverman, D., 2001, 'Interpreting Qualitative Data: Methods for Analyzing Talk, Text and Interaction' (2nd-ed.), London: Sage.
201. Simon, H.A., 1963, 'Economics and Psychology', in Koch, S. (eds.). *Psychology: A Study of Science*, New York: McGraw-Hill.
202. Simon, H.A., 1969, 'Adapting to the Need to Understand Thought', in Voss, J. F. (Ed.), *Approaches to Thought*, Columbus, OH: Merrill.
203. Simon, H.A., 1979, 'Models of Thought', New Haven, CT: Yale University Press.
204. Simon, H.A., 1979, 'Rational Decision Making in Business Organizations', *American Economic Review*, vol. 69: 493-513.
205. Singleton, R. A. and Straits, B. C., 1999, 'Approaches to Social Research' (3rd-Ed), New York: Oxford University Press.
206. Solow, R. M., 1956, 'A Contribution to the Theory of Economic Growth', *Quarterly Journal of Economics*, vol. 70:65-94.
207. Sorenson O. and Stuart T.E., 2001, 'Syndication Networks and the Spatial Distribution of Venture Capital Investments', *American Journal of Sociology*, vol. 106:1546 -1588.
208. Spence, M. and Zeckhauser, R., 1971, 'Insurance, Information, and Individual Action', *The American Economic Review*, vol. 61: 380-387

209. Spinellie, 1989, 'The Interpreted World', London: Sage.
210. Stanfield, J. R., 1986, 'The Economic Thought of Karl Polanyi: Lives and Livelihood', New York: St. Martin's Press.
211. Stanfield, J. R., 1999, 'The Scope, Method, and Significance of Original Institutional Economics', *Journal of Economic Issues*, vol. 33: 231-255.
212. Stiglitz, J., 1974, 'Incentives and Risk Sharing in Sharecropping', *The Review of Economic Studies*, vol. 41:219-255.
213. Tan, H., Buckley, P. and Clegg, J., 2006, 'Cultural Awareness in Knowledge Transfer to China - The Role of Guanxi and Mianzi', *Journal of World Business*, vol.41: 275-288.
214. Taylor, S. and Bogdan, R., 1984, 'Introduction to Qualitative Research Methods: The Search for Meanings' (2nd-ed.), New York: John Wiley & Sons.
215. Tyebjee, T. T and Bruno, A. V., 'A Model of Venture Capitalist Investment Activity', *Management Science*, vol. 30: 1051-1066.
216. Wang, C., 2002, 'Differences in the Governance Structure of Venture Capital: The Singapore Venture Capital Industry', conference paper, International Conference on Financial Systems, Corporate Investment in Innovation and Venture Capital, Brussels.
217. Wang, S and Zhou, H., 2004, 'Staged Financing in Venture Capital: Moral Hazard and Risks', *Journal of Corporate Finance*, vol.10:131-155.
218. Wells, W.A., 1974, 'Venture Capital Decision Making', PhD Thesis, Carnegie-Mellon University.
219. White, S., Gao, J. and Zhang, W., 2002, 'China's Venture Capital Industry: Institutional Trajectories and System Structure', conference paper, International Conference on Financial Systems, Corporate Investment in Innovation and Venture Capital, Brussels.
220. Williamson, O. E., 1979, 'Transaction Cost Economics: The Governance of Contractual Relations', *Journal of Law and Economics*, vol.22: 233-261.

221. Williamson, O. E., 1981, 'The Modern Corporation: Origins, Evolution, Attributes', *Journal of Economic Literature*, vol.19: 1537-1568.
222. Williamson, O. E., 1985, 'The Economic Institutions of Capitalism: Firms Markets, Relational Contracting', New York, NY: The Free Press.
223. Williamson, O. E., 1988, 'Corporate Finance and Corporate Governance', *Journal of Finance*, vol.43: 567-91.
224. Williamson, O. E., 1991, 'Comparative Economic Organization: The Analysis of Discrete Structural Alternatives', *Administrative Science Quarterly*, vol. 36: 269-296.
225. Williamson, O. E., 1991, 'Economic Institutions: Spontaneous and Intentional Governance', *Journal of Law, Economics, and Organization*, vol.7:159-187.
226. Williamson, O. E., 1996, 'Revisiting Legal Realism: The Law, Economics, and Organization Perspective', *Industrial and Corporate Change*, vol.5: 383-420.
227. Wilson R., 'The Theory of Syndicates', *Econometrica*, 1968, vol. 36:119-132.
228. Wright, M., Manigart, S, Desbrières, P and Sapienza H. J., 1997, 'Venture Capital Firms and Equity Investment Appraisal in the US, UK, France, Belgium and Holland', *Management Buy-Outs*, vol.3: 19 -35.
229. Wright, M., Lockett A., Pruthi S., Manigart S., Sapienza H. J., Desbrières P. and Hommel U., 2004, 'Venture Capital Investors, Capital Markets, Valuation and Information: US, Europe and Asia', *Journal of International Entrepreneurship*, vol. 2: 305 -326.
230. Xiao, Z., Weetman, P. and Sun, M. L., 2004, 'Political Influence and Co-existence of a Uniform Accounting System and Accounting Standards in China', *Abacus*, vol.40: 193-218.
231. Yin, R. K., 1994, 'Case Study Research: Design and Methods' (2nd-ed), Thousand Oaks, CA: Sage.

232. Zucker, L.G., 1991, 'The Role of Institutionalization in Cultural Persistence', in Powell. W and DiMaggio P. (eds), *The New Institutionalism in Organizational Analysis*, Chicago: University of Chicago Press.
233. Zutshi, R. K., Liang, W. T., Allampalli, D. G. And Gibbons, P. G., 1999, 'Singapore Venture Capitalists (VCs) Investment Evaluation Criteria: A Re-Examination', *Small Business Economics*, vol. 13: 9–26.