

**An institutional approach to changes in property rights
within China in transition –
Change of property rights and ownership in high-tech spin-offs
in the reform era**

Thesis submitted for the degree of

Doctor of Philosophy

At the University of Leicester

By

Yang Chen
The China Centre
Northampton Business School
University College Northampton

March 2004

UMI Number: U188011

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



UMI U188011

Published by ProQuest LLC 2013. Copyright in the Dissertation held by the Author.
Microform Edition © ProQuest LLC.

All rights reserved. This work is protected against
unauthorized copying under Title 17, United States Code.



ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106-1346

To my dear parents, *Zhang Ruilin* and *Chen Qingsheng*

Abstract

The aim of this research is to develop a thorough understanding of the change of ownership and property rights in the context of China in transition, with all the political and social implications that the process entails.

This study aims both to understand and challenge the basic theoretical underpinnings of conventional property rights theory, to examine what the received wisdom of the private property rights perspective offers and to discover to what extent it is applicable in the Chinese transitional context. Through an extensive literature review, this research argues that the mainstream property-rights school fails to consider the institutional and organisational context of the societies in which economic institutions operate.

This study evaluates the basic and most widely believed paradigm of institutional change - that of the Washington property rights school - and challenges it with empirical evidence. This study evaluates different models of institutional change and generates an original institutional approach to the change of property rights in the context of China-in-transition. Research for this PhD adopts an institutional methodological approach in an empirical study of the change of property rights and ownership of high-tech spin-off enterprises in China. This research is micro in approach providing a bird's - eye view of the evolution of property rights and ownership of Chinese enterprises in the context of transition through multiple case studies of high-tech spin-offs.

The research identifies the strong presence of the state associated with the evolution of high-tech spin-offs in transitional China, the process of which has also been characterised by fuzzy property rights and public entrepreneurship as two key stepping stones of development. The research findings indicate that the appropriate structure of property rights over productive assets is a dependent variable as opposed to an explanatory variable, as suggested by the property-rights school.

Acknowledgements

There are many to thank in the writing of a Phd this length (not in my native language) on such a complicated subject. Over the last three and half years, I have often wondered whether I have been foolishly ambitious in challenging well-established mainstream theories and wished that I had adopted a more conventional standpoint. But as the research went on I became more convinced that the core argument of the research – that it is necessary to cast doubts on ideological commitment to privatisation policy *per se* in transitional economies – is correct.

I wish to express my sincere gratitude to the many individuals and organisations who significantly contributed to this research. The first person whom I must thank is Richard Sanders, who gave me the opportunity to engage in the study on the question of property rights in transitional China, who shares my passion for the subject, who has fought battles and experienced good and difficult times with me throughout the past three and half years. Richard is powerfully insightful, dedicated and has supported my research without any reserve. There is no chapter where his correction and polish has not been important. I hope he is pleased with my work.

Peter Laurence joined in my supervision team when the research was half way through. It was the time that my morale hit its nadir. I was so lucky to have Peter walking in at that time with his enormous encouragement, his spot-on guidance and his charming sense of humour. Together, Peter and Richard provided the support and guidance without which this work could not have been completed.

I was also lucky having guidance and support from Stephen Swailes and other colleagues from Northampton Business School. My thanks also go to ladies in the Nene Centre for Research for their amiable smiles and support.

I owe thanks to my friends and ex-colleagues in China for their insights, patience and time. They helped me in understanding and building up networks, kindly hosted my visit to Easter Lake High-tech Development Zone in Wuhan, arranged the field trips to local high-tech companies in Wuhan for me and provided valuable alumni links for me. My sincere thanks also go to a large number of staff from HUST spin-offs who provided me raw facts from which this research conjures up arguments. None of my Chinese friends should take any responsibility for my thesis. If there is any problem, it is all my fault.

I am indeed indebted to my personal friends Xiaoxia and Ping for being there during good as well as difficult times and for the support they always lent me. To my dearest Ahmad Al-khattat, all I can say is a profound and intensely felt thank-you for being there with me throughout such a tough journey.

Table of Contents

Table of Contents	i-vi
List of Tables	vii-viii
List of Figures	ix-x
List of Boxes	xi
Acronyms	xii
 Introduction	 1-12
I. The context of this research: China's unique experience?	1-4
II The objectives of this research	4-9
Research objective 1	
Research objective 2	
Research approach	
II. Relevance between this research and the current debate on further reform	9-10
IV Structure of the study	11-12
 Chapter 1: The changing nature of ownership and property rights in the context of China in transition	 13-56
1.1 The changing nature of enterprise in the Mao era	14-16
1.1.1 Dominant state ownership	
1.1.2 "Danweilised" enterprises under the Party/State Maoist Regime	
1.2 Diversification of ownership of enterprises in Post- Mao China	16-26
1.2.1 The lifting of ideological constraints and the dilution of state ownership	
1.2.1.1 The lifting of ideological constraints	
1.2.1.2 Diversification of state ownership	
1.2.2 The hidden privatisation of SOEs: the key link between ideological constraints and enterprise reform	
1.3 Evolution of new agency problems associated with gradual enterprise reform of the state sector in the 1980s	27-32
1.3.1 The problem of incentives	
1.3.2 Predatory behaviour	
1.4 Diversification of ownership and the question of corporate governance	33-38
1.4.1 Clearly defined property rights and the question of corporate governance	
1.4.2 The embedded conflicts of adopting corporate governance in a transitional economy	

1.5 Transitional enterprise system with Chinese characteristics	38-47
1.5.1 Co-operative Shareholding – an institutional innovation	
1.5.2 The practical outcomes of the co-operative shareholding system	
1.6 Shareholding Restructuring and Modern Enterprise System – Another Chinese Characteristic of Ownership Reform	47-52
1.6.1 The failure of the transformation of large SOEs into publicly listed companies	
1.7 Conclusion: privatisation past the point of return	53-56
 Chapter 2: Literature review: the question of property rights in the context of China in transition	 57-95
Introduction	57-59
2.1 Concepts of property rights and ownership	60-63
2.1.1. Property rights as a material thing	
2.1.2 Property rights as a set of social and economic relations	
2.2 Conventional property rights theory	64-85
2.2.1 The Coase Theorem	
Critique of the ‘Coase Theorem’	
2.2.2 Critique of the application of the ‘Coase Theorem’	
The ‘circularity problem’	
2.2.3 Applications of the Coase Theorem in research on the transitional economy of China	
2.2.3.1 The Coase doctrine in relation to the research on transitional economies generally	
A: Mainstream arguments	
B: Critique of mainstream arguments -transaction costs: the costs of using the market mechanism	
C: The ‘circularity dilemma’	
2.2.3.2 The application of Coase Theorem in research to China’s state sector reform	
2.2.3.3 The application of conventional theorem on research of Township and Village Enterprises (TVEs)	
A: The ambiguous property rights of TVEs	
B: Elaboration of ‘reconciliation’ models	
2.2.3.4 Does the evidence of TVEs support a new paradigm? - benefits of not assigning property rights	
2.2.3.5 Conclusion on the discussion of Coase Theorem	
2.3 A review of the world-wide privatisation movement	86-95
2.3.1 Empirical evidence concerning privatisation in non-transitional countries	
2.3.2 The empirical evidence of privatisation of other transitional countries	
Dilemma	
2.3.3 Chinese experience: could economic reform coupled with privatisation lead to even greater performance?	

Chapter 3: Methodology	96-120
3.1 Review of the methodology adopted in research the Chinese transitional economy	96-101
3.1.1 Academic opportunism	
3.1.2 From Marxism-Leninism to neo-classical doctrine	
3.1.3 The dominant neo-classical presence	
3.2 The method of identifying research questions	101-103
3.3 Using appropriate research methodology to address research questions	103-109
3.3.1 Limit of the methodology of neo-classical approach	
3.3.2 Methodological differences between institutional & neo-classical approaches in economic research	
3.4 The adoption of an institutional approach in this study	110-114
3.4.1 The need to balance analytical vigour with contextual circumstances	
3.4.2 Adoption of non-teleological openness	
3.5 An Institutional approach to property rights	114-120
3.5.1 The ‘Property rights school’: the basic and most widely accepted notion of institutional change	
3.5.2: Variants of the property right approach to institutional change	
3.5.2.1 “Induced institutional innovation”	
3.5.2.2 A mismatch theory of institutional change	
3.5.3 Douglass North’s approach	
3.5.3.1 North’s model of institutional change	
3.5.3.2 Approaches adopted in this thesis	
Chapter 4 Case Study Methods	121-135
4.1 Why Case Studies?	121-131
4.1.1 Adopting the method of case studies to serve the methodology of this study	
4.1.1.1 The institutional approach of the study	
4.1.1.2 The case studies strategy	
4.1.2 Methods adopted for case studies	
4.1.2.1 Multiple case studies: the scope and structure of the case studies	
4.1.2.2 Holistic and exploratory case studies: theory development	
4.1.2.3 Building explanation: analytic generalisation	
4.2 Fieldwork methods	131-135
4.2.1 General fieldwork methods	
4.2.2 Building up and maintaining ‘guanxi’	
4.2.3 Problems encountered in the fieldwork	

Chapter 5 The Evolution of High-tech Industry in the Context of China in Transition **136-164**

Introduction **136-137**

5.1. The development of the high-tech sector in the context of China in transition **137-142**

5.2 The Evolution of China's High Tech Sector **142-157**

5.2.1 Institutional Evolution

5.2.1.1 The theory of reconstitutive downward causation

5.2.1.2 Downward reconstructive entrepreneurship from the collective legacy

5.2.1.3 Government's role in the Development of Science & Technology

5.2.2 The National High Technology Research and Development Programme of China – The 863 Programme

5.2.2.1 Policymaking and management of the 863 Programme

5.2.2.2 Success of the 863 Programme

5.2.3 The Torch Programme and the Introduction of High-Tech Development Zones (HTDZs)

5.2.3.1 Characteristics of the Torch Programme

5.2.3.2 The semi-authority, semi-entrepreneurial institutions – HTDZs

5.3 The *Evolution* of the Government-Industry-University Partnership in China **158-164**

5.3.1 The evolution of the government-industry-university partnership resulting in diversified ownership structure of high-tech enterprises in transitional China

5.3.2 Characteristics of University Spin-offs

Chapter 6 Property rights arrangements of high-tech spin-offs at the start-up stage **165-205**

Introduction **165-167**

6.1 The formation of property rights and the ownership of new high-tech spin-offs at the start-up stage **167-170**

6.1.1 Forms of 'Spinning-off' in China

6.1.2 Two-type format

6.2 Hypothesis **171-175**

6.2.1 The problems of Type I spinning-off

6.2.2 The problem of Type II spinning-off

6.3 Spinning-off: the case of Beijing High-tech Test Zone **175-201**

6.3.1 Two stages of spinning-off - from commercialisation to industrialisation: mid 1980s –1992

6.3.2 Organisational features and the development of ownership of high-tech spin-off in the Beijing Test Zone – a process of "embedded arbitrage"

6.3.2.1 The framework of analysis of embedded arbitrage	
6.3.2.2 The analysis of state-owned NTEs	
6.3.2.3 An analysis of collectively owned NTEs	
6.3.3 The ‘bottle neck effect’ associated with the question of productive factors and resource allocation	
6.4 Interpretation	201-205
6.4.1 A summary of the identified phenomena	
6.4.2 Interpretation: institutional arbitrage of <i>de facto</i> control	
 Chapter 7 High-tech spin-offs of leading universities at the start-up stage and the case of Huazhong University of Science & Technology (HUST)	 206-251
7.1 The key high-tech spin-offs of leading universities	207-211
7.1.1 The development of Science and Technology Development Companies (<i>keji kaifa gongsi</i>) in leading Universities	
7.1.2 Property rights arrangements of key spin-offs	
 7.2 Huazhong University of Science & Technology - a university developed out of the plan: a historical review	 211-226
7.2.1 A state nurtured university	
7.2.2 Historical background: the new mechanism	
7.2.3 ‘Jumping into the sea of business’	
7.2.4 Policy matters	
7.2.5 The property rights arrangement of the ‘department business’ (<i>xiji jingji</i>) and the early development of spin-offs at HUST	
 7.3 Laser technology Spin-offs of HUST	 226-241
7.3.1 The legacy of collective intellectual property rights and the development of laser industry in the reform era	
7.3.1.1 The review of laser technology development in China	
7.3.1.2 The development of laser industry – technology diffusion “with the Chinese characteristics”	
7.3.2 Laser spin-offs of HUST	
7.3.3 A different path – the experience of other laser high-tech companies	
7.3.3.1 The experience of Chutian Laser	
7.3.3.2 Ambiguity of intellectual property rights – a double-edged issue	
 7.4 Individualism growing out of collective legacy	 242-251
7.4.1 Criticism of the conventional wisdom	
7.4.1.1 The conventional private property myth	
7.4.1.2 Diversified entrepreneurship theories	
 7.4.2 Public entrepreneurship for the collective good	
7.4.2.1 The lack of absolute property rights and of an individualistic culture in China	
7.4.2.2 Public entrepreneurship – a stepping stone	
7.4.2.3 Fussy property rights - another stepping stone	

Chapter 8 Change of Property Rights and Ownership of High-tech Spin-offs in the Transition to Publicly Listed Company (PLCs) **252-313**

8.1 Institutional constraints on changes in ownership and control within publicly listed companies. **253-272**

8.1.1 The stock mechanism: beleaguered policy choice

8.1.2 Institutional Analysis

8.1.2.1 Institutional arrangements of the Chinese Stock Market

8.1.2.2 Institutional dilemma - failed attempts at clarifying property rights through shareholding restructuring in the stock market

8.2 Case study of high-tech Shareholding Corporations **272-286**

8.2.1 The background of university high-tech publicly listed companies

8.2.2 Key findings

8.3 Question of Corporate Governance within PLCs **287-301**

8.3.1 The absence of the ultimate principle and the formation of networking executives

8.3.2 Leadership and management issues within university high-tech PLCs

8.3.3 Ownership structure of sample university PLCs

Appendix of Chapter 8: Data **302-313**

Chapter 9 Conclusion **313-325**

9.1 The path dependence features and consequences associated with high-tech spin-offs **314-321**

9.2 Challenge to neo-classical property rights perspective **321-324**

9.3 The relevance to future research **325-329**

Bibliography **330-347**

List of Tables

Table 1.1	Gross Industry Output in China (1980-1998)	20
Table 1.2	Number of Staff and Worker by Ownership (million persons) (1984-2000)	23
Table 1.3	The Economic Significance of the Private Sector in terms of taxes contribution	26
Table 1.4	Market vs. Regulated Prices, 1990-94 (%)	28
Table 1.5	Different ownership and governance structure	39
Table 1.6	De facto privatisation of small & medium sized SOEs in 1990s	44
Table 1.7	SOEs Autonomy	48
Table 5.1	Statistics on Higher Education for Scientific and Technological Activities	148
Table 5.2	Distribution by the nature of project undertaken (2001)	149
Table 5.3	The ownership structure of high-tech enterprises in China by the end of 1997	162
Table 5.4	Development stages of high tech spin-offs	164
Table 6.1	Summary of reform policies and major breakthroughs in the 1980s	173
Table 6.2	Growth of High-tech Zones and New Technology Enterprises	176
Table 6.3	No. of Enterprises whose total industrial output value exceeded 5 million yuan, 10 million yuan and 100 million yuan in 1991 in Beijing Test Zone	181
Table 6.4	Share of Self-developed Products (SDP) in the Beijing Test Zone	181
Table 6.5	The ownership structure of NTEs in Beijing Test Zone from 1988 – 1991	185
Table 6.6	The ownership structure in percentage of NTEs in Beijing Test Zone from 1988 – 1991	185
Table 6.7	The Nature of Joint NTEs	191
Table 6.8	The ownership structure of the collectively owned high-tech enterprises	197

Table 6.9	The number of enterprises among the top 50 by nature of ownership	198
Table 7.1	Key spin-offs of leading universities	209
Table 7.2	Horizontal projects in the early 1980s	215
Table 7.3	The development of laser technology in the 1960s	227
Table 7.4	The sales of laser industry in application fields in the 8 th Five-Year-Plan (1990-1995)	229
Table 7.5	The statistic of laser medical products in the 8 th Five-Year-Plan (1990-1995)	230
Table 7.6:	The statistic of laser processing equipment in the 8 th Five-Year-Plan (1990-1995)	230
Table 8.1	Development of Chinese stock market from 1991- 2000	257
Box 8.3 Table	Share structure of Huagong High-tech PLC	269
Table 8.2	Leading university spin-offs	276
Table 8.3	Largest share holders of 23 universities PLCs	280
Table 8.4	The flexibility of legal person shares	285
Box 8.5 Table 1	Directors of board of Huagong High-tech	296
Box 8.5 Table 2	Members of the board of Supervisors with Huagong High-tech	297
Appendix table 1	Share structure of sample high-tech PLCs on 2002-06-30	305
Appendix table 2	Share structure of sample high-tech PLCs in the year listed	306
Appendix table3	The size and rank of university high-tech PLCs in Chinese stock market (2000)	307
Appendix table 4	Ownership structure of shares in Chinese stock markets	308

List of Figures

Figure 1.1	Output value of industry by ownership, 1978-95	21
Figure 2.1	Levels of GDP in transitional countries in 1989 and 2001	92
Figure 4.1	A three-dimensional case study structure	127
Figure 5.1	Government-Industry-University Partnership	160
Figure 6.1	Number of NTEs in Beijing Zone and total number of NTEs in high-tech zones in China: 1983 – 1993	176
Figure 6.2	Number of high-tech zones in China: 1988 – 1993	177
Figure 6.3	The ownership structure in percentage of NTEs in Beijing Test Zone from 1988 – 1991	186
Figure 6.4	The ownership structure of the collectively owned high-tech enterprises	198
Figure 7.1	The flow of allocation of resources, R&D tasks under the planned system and the position of HCT within the system	212
Figure 7.2	The flow of allocation of resources, R&D tasks under the reforming system and the position of HCT within the system	214
Figure 7.3	The planned budget system of the university and change	224
Figure 8.1	The status of sample universities	273
Figure 8.2	Relationship between the university and the company	273
Figure 8.3	Relationship between the university and the company II	274
Figure 8.4	Industrial sectors of university publicly listed companies	277
Figure 8.5	State-owned shareholding in the 23 university PLCs researched at year of flotation	282
Figure 8.6	State-owned shareholding in the 23 university PLCs researched in 2002	282
Figure 8.7	Tradable shareholding in the 23 university PLCs researched at year of flotation	283
Figure 8.8	Tradable shareholding in the 23 university PLCs researched in 2002	283

Figure 8.9	Legal person shareholding in the 23 university PLCs researched at year of flotation	284
Figure 8.10	Legal person shareholding in the 23 university PLCs researched in 2002	284
Figure 8.11	Employee shareholding in the 23 university PLCs researched at year of flotation	285
Figure 8.12	Creator shareholding in the 23 university PLCs researched currently	286
Figure 8.13	A Comparative Case of Shanghai State Asset Management System and Anglo-American Corporate Governance Model	289
Figure 8.14	The flow of ownership and legal person property rights after incorporation and shareholding reform	292
Figure 8.15	Management and control in the 23 university PLCs researched at the year of flotation	294
Figure 8.16	Management and control in the 23 university PLCs researched in 2002	294
Figure 8.17	Leadership in 23 university PLCs researched in 2002	295
Box 8.5 Figure 1	Corporate Governance Model in Huagong High-tech	298
Figure 8.18	The ownership structure of Peking University Founder Group Corporation	300
Appendix Figure 1	Capital Structure of Chinese stock market as of 31/12/1999	310

List of Boxes

Box 6.1	The case of ‘Secondary R&D’ in computing science NTEs in the Beijing Zone	182
Box 6.2	The case of Taichi Computing Co.: ‘one institution, two mechanisms’	190
Box 6.3	The case of the New Special Vacuum Technology Development Co.	193
Box 6.4	The case of Huahai Co.: combining the strength of resources	195
Box 6.5	The case of Zhonghuan Bidding Technology Co.	196
Box 6.6	The Case of Haidian District	197
Box 7.1	‘Science and Technology Development Companies’ at start-up stage	208
Box 8.1	Restructuring the semi-official institution to PLCs - the transformation of High-tech Management Committee: the case of East Lake High-tech PLC	259
Box 8.2	Ceding ownership for business growth: Trading of ownership and control rights between East Lake High-tech and private enterprises	260
Box 8.3	Strengthened or weakened? Rights of control with Huagong High-tech PLC	268
Box 8.4	Agreements between Huagong High-tech and HUST	274
Box 8.5	Corporate Governance Structure within Huagong High-tech	295

Acronyms

BT	Biotechnology
CAD	Computer assisted design
CCP	Chinese Communist Party
CSRC	Chinese Securities Regulatory Commission
FIE	Foreign invested enterprise
HKSZ	Hong Kong Stock Exchange
HPLC	High-tech publicly listed company
HRS	Household responsibility system
HTDZ	High Technology Development Zones
HUST	Huazhong University of Science and Technology
ICT	Information Communication Technology
MBO	Management buy out
MES	Modern Enterprise System
MOST	Ministry of Science and Technology
MT	Material technology
NTE	New technology based enterprise
NTBF	New technology based firm
PBC	The People's Bank of China
SAC	State Asset Committee
SAGC	State Asset Group Companies
SAMO	State Asset Management Office
SAOC	State Asset Operating Companies
SETC	State Economic and Trade Committee
SEZ	Special Economic Zone
SHSE	Shanghai Stock Exchange
SIP	Share issue privatisation
SOE	State owned enterprise
SPC	State Planning Committee
SRC	State Economic System Reform Commission
STDC	Science and Technology Development Company
SZSE	Shenzhen Stock Exchange
TVE	Township village enterprise
USTP	University Science & Technology Park

Introduction

I. The context of this research: China's unique experience?

China's social and economic 'churn' is undeniably one of the great transitions of the last quarter of the twentieth century. As a transitional developing country, China has undergone intensive transformation in terms of industrialisation and urbanisation, while, at the same time, its economy has evolved from 'the plan' to 'the market' and from isolation to gradual integration with the world economy in the course of just two decades. As part of a broad historical post-socialist transition movement, compared with other post-socialist transitional countries, China stands out in that it has achieved fast rates of economic growth¹ without political liberalisation. Meanwhile, it has maintained a large measure of social stability and allowed the majority of Chinese to enjoy a significant improvement in their living standards.

China also stands out in that it has not uncritically adopted standard textbook solutions to the problems and dilemmas of transition. China's experience, described by Naughton (1994) as 'growth out of plan', has been repeatedly contrasted with the orthodoxy of neo-liberal economics. In particular, China did not undertake *once-and-for all privatisation* as either a solution to a problem or an end in itself. Instead, it has tentatively and pragmatically adopted a path of gradual diversification of ownership, in the first decade of transition in 1980s in particular, along with gradual decentralisation and liberalisation of the economy in the hope of achieving economic prosperity and improving peoples' living standards.

One of principle arguments of this study is that the 'transitology'² of China from the very beginning was never concerned with transition *per se*, nor did it focus on the creation of capitalism or the search for the optimal allocation of resources through privatisation, but with a *pragmatic* search for wealth creation, welfare improvement, growing efficiency and social harmony. One of the characteristics of China's reform is that China has had to handle the dual challenge of 'development' and 'transition'

¹ It is recognised that China grew at an estimated average rate of 10 percent in the past two decades.

² The concept proposed by Laszlo Csaba (2002)

simultaneously. Regarding the relationship between ‘development’ and ‘transition’, as Deng Xiaoping once indicated, “*development is the fundamental principle*” while the ultimate purpose of ‘reform’ or ‘transition’ in China is to facilitate economic development and improve people’s living standards. ‘Transition’ is not simply a linear process in which the backbone of ‘the plan’ is broken and replaced by the spine of ‘the market’. Thus, economic prosperity *and* social stability have been dual principles of the reform.

This study identifies two stages of China’s reform process in terms of the nature and scale of the transition. The first stage occurred from 1978 to 1992, characterised by gradual transformations which subsequently facilitated more radical transformations of China’s economy and society, which have taken place in the second stage from 1992 to the present day.

This study emphasises that in the early stage of reform, there was a reliance on ‘bottom-up’ and ‘trial-by-error’ strategies in the sense that policies were initiated and tested at grass roots and were adopted if appropriate to the *contextual circumstances* of China. These earlier strategies shaped the unique path of transition of China, and the sobriquet of ‘with Chinese characteristics’ (*juyou zhongguo tese*), which has been extremely useful for defining unconventional reform methods and justifying unexpected reform outcomes was particularly pertinent at this time. This study argues that given China’s isolation in the previous three decades, the neo liberal conventional wisdom of the economic world of the 1980s³ was introduced into China by Chinese scholars only at a much later stage, and thus had much less (destructive) impacts on China’s transition as compared with its much greater influence on former Soviet-bloc and central and eastern European countries at the end of 1980s and early 1990s.

However, neo-liberalism exercised its muscles on a much greater scale in China throughout the second decade of reform. Moreover, from middle 1990 onwards, there has been a tendency to embrace it in China at a pace and to an extent that the

³Neo liberalism in this context is defined as ‘liberal’ or ‘neo-liberal’ economics that is free market economics asserting the primacy of individualism.

conservatives would not have imagined⁴. Reforms of the 1980s were successful in many ways, not least in that the early reforms gained the enthusiastic support of a majority of Chinese people as the fruits of a successful economy were spread around and allowed a large number of people to become substantially better-off. The second stage of reform in the 1990s produced a much more complicated scenario. China is currently an economic superpower, but it is a nation with a divided society facing increasing inequality and all its associated problems.

With regard to the critical problems facing China, mainstream neo-liberal arguments both inside and outside China have concentrated on the (arguably intensively frustrating) issue of inefficiency in the state owned sector. Privatisation is frequently prescribed as the remedy to solve the problems, together with policies that favour the development and growth of the non-state sectors, private business in particular. Scholars and decision makers inside China have become interested in importing a wide range of privatisation instruments, and tools such as management buy out (MBO) and share issue privatisation (SIP) have been widely (although unofficially) adopted in the past two years. Echoing their voice, scholars outside China have provided their Chinese counterparts with lessons from other transitional countries' privatisation experience, those from Russia in particular. Aligned with privatisation policies, there are also growing arguments which favour 'smaller' government and which increasingly question the very legitimacy of government tools of regulation, legislation and taxation.

However, given the difficulties of the former Soviet-bloc and other post-socialist transitional countries which have experienced shock therapy, the question arises as to whether the application of further privatisation and other 'liberal' instruments are appropriate to solve the problems that challenge China today and to provide further sustainable economic growth? The neo-liberal school would argue *yes* to this question, propose a 'convergent path' for China's further transition, and argue that China will eventually adopt the philosophy that has already become seamlessly part of

⁴ While the public in the U.K. are still debating on the issue of top-up fees, China has already commercialised its higher education sector and charged full tuition fees and as a result, in average 70% income of a Chinese family goes to children's education. Social welfare network and public health service that was established under Mao has been knocked down and completely 'commercialised'.

the new international 'common sense' – the core of which is to celebrate individualism and denigrate the state.

But, the very experience of transition, both its successes and (often painful) failures, of China herself in the past two decades has been a real challenge to the neo-liberal school inside China. The conclusion of many previous studies on China, both theoretical and empirical, suggests that instruments of reform including enterprise restructuring, concentrating on improving the allocation of property rights and incentives, can yield economic growth even without privatisation and that market liberalisation, competition and price deregulation are more important than privatisation *per se*. However, the crucial question that has yet to be satisfactorily addressed is *how and under what circumstances did non-privatising reform work in China?* The understanding of this crucial question is important in the sense that the answer to it leads to legitimate analysis of the critical question - could economic reform coupled with privatisation lead to even more successful economic performance in China in the future? After all, there is a *need* to de-construct the Chinese experience of transition in the past two decades in order to understand the likely impacts of privatisation in the next one.

II The objectives of this research

This study is a response to these needs and concerns. One of the neo-liberal pillars is that the law of private property rules supreme. Many conventional economists regard clearly defined *property rights* as a necessary condition for the 'efficient' operation of the market. It is widely believed that the free market, operating through the price mechanism and girded by well-defined property rights, provides the incentive structure needed to achieve efficient allocation and growth. This idea has been regarded as 'the absolute truth' and adopted by many economists as axiomatic in their studies. In particular, it leads them to claim that the absence of well-defined private property rights, or the existence of attenuations or restrictions on property rights, inevitably gives rise to distortions which can only be resolved by privatisation. According to the basic and most widely believed paradigm of institutional change - the Washington property rights school which remains the dominant political and economic current in the studies of transitional economies- essential to any change in

the institutional framework is a change in the structure of property rights. This study is profoundly critical of this point of view of this school.

Research objective 1

This study aims to critically analyse the basic theoretical underpinnings of conventional property rights theory, to examine what the received wisdom of the private property rights perspective offers and to discover to what extent it is applicable in the Chinese transitional context.

As the privatisation perspectives are derived from the *Coase Theorem* and *Demsetz's instrumental perspectives of property rights*, this study evaluates these theories theoretically and challenges them with empirical evidence. Through an extensive literature review, this study argues that the mainstream property-rights school fails to consider the institutional and organisational context of the societies it seeks to explain.

The arguments of this study are not accepted by mainstream scholarship on China, and if this study does its work I expect a vigorous debate. However, that I am critical of neo-classical property rights theory does not mean that I am necessarily anti-privatisation *per se* or that I am opposed to private property regimes. I believe that neo-classical property rights theory is theoretically tenable in its own right and that privatisation is potentially a viable tool of statecraft. What I argue in this study is that property rights theories cannot be applied mechanically and blindly without consideration of contextual circumstances. Moreover, this study argues that it is dangerous where an economic theory is transformed into an ideology, which is pursued dogmatically.

As Deng Xiaoping himself said: "Seek truth from facts". There are two interrelated features – gradualism & pragmatism - that form the uniqueness of China's economic reform. Deng Xiaoping originally coined China's trial-by-error reform strategy as "crossing the river by feeling the stones". The strategy of China's gradual reform as a pragmatic 'bottom up' process emphasises the importance of local conditions and initiatives rather than textbook blueprints as the key determinants of change. Instead

of demolishing the extant socialist planned economy, China started its economic reform by relaxing ideological constraints. This encouraged local tests and trials and once they were perceived as serving the principles of economic prosperity and social stability, the Party / State pragmatically authorised and legalised them.

One of the geniuses of Chinese economic reform has always been the ambiguity that facilitates revolutionary change in a mask of normality. To many observers, it is an ideological dilemma that throughout the transition, China has so far been a socialist nation committed to the development of a socialist market economy, yet one with a growing large non-state sector.

For Chinese, such ambiguity is consistent with the gradual and pragmatic approach of reform. As Gang Fan neatly concludes: “in short, the definition and contents of ‘the socialist market economy’ (in China) change over time according to the changing circumstances. Talking only about ‘what is achievable and acceptable’ without specifying a ‘final destination’ (has) its pragmatic virtues and saves a lots of political costs” (2002, p.9). Oi (1998) has the same opinion with the support of empirical evidence that “the Chinese have a great tradition of muddling through, of seeking out a method (*xiang bangfa*), of accepting what is approximately correct (*cha bu duo*), and of living with a host of contradictions”.

In the terrain of Chinese industrial reform, the most important feature of China’s ‘gradual’ or ‘incremental’ approach to institutional transformation so far has been the *coexistences* of the development of the market-oriented non-state sector and the reform of the state sector. In the past two decades, we have witnessed the rise of market-oriented collectives, township and village enterprises (TVEs), small individual manufacturing businesses coupled with overseas capital and larger sized foreign joint ventures that together account for a significant portion of the economic growth and employment growth experienced in China. Despite the fact that the perennial issue of state-owned enterprises (SOEs) reform has always been seen as a major critical problem that has beset the Chinese economy, and despite the fact that the contribution of SOEs to China’s total industrial output has declined significantly, by 1998 (after twenty years of reform), SOEs constitute almost all the nation’s heavy industrial base and provide employment and social welfare for the vast majority of China’s urban

workers. SOEs even today provide the bulk of fiscal revenues for both central and regional governments.

The current ‘coexistences’ of the state and non-state sectors entail blurred boundaries between the state, collective and private sectors in contrast to the comparatively clearly defined boundaries between state and non-state status before the reform. As a result of the continuous restructuring of the state sector through the introduction of market institutions, China consequently has become a country where SOEs claim ‘public ownership’ over industrial assets, but not necessarily ‘state ownership’, a country with few private firms but a large number of non-state firms whose identities constantly swing between the private, collective and even public sector. State firms are officially owned by all the people, yet almost all large sized SOEs issue shares to individuals on the Shanghai and Shengzhen stock exchanges. A growing number of Chinese industrial national champions are also listed and traded as ‘red chips’ on the Hong Kong and New York stock exchanges.

Research objective 2

In the light of such ambiguity and muddiness, instead of taking the rights-based efficiency evaluation and explanation, this study adopts a somewhat unorthodox framework that attempts to offer an understanding of the formation of such co-existences. Instead of asking which sector, the public, collective or private, is more efficient,

this study attempts to identify how and under what circumstances the reform of the state sector created and improved the conditions for the development of new sectors and associated changes to the economic structure, and vice versa

Research approach

The aim of this study is to understand the changes of ownership and property rights in the context of China in transition, with all the political and social implications that the process entails. This research is micro in approach providing a bird’s –eye view of the evolution of property rights and ownership of Chinese enterprise in the context of

transition through multiple case studies of high-tech spin-offs. The micro case studies are effective in illustrating the interaction between institutions and business organizations, the fundamental force that shapes the institutional evolution of an economy. The case studies show that political and economic institutions that create the incentive structure of a society, in consequence, are the underlying determinants of economic performance. The organizations that come into existence will reflect the opportunities provided by the institutional matrix.

The case studies also demonstrate that the current situation shapes the institutions of tomorrow and that, as a result, institutional change cannot be explained in abstract from past institutional frameworks. Thus this study argues that, with regard to China, the institutional arrangements of the Mao era (1949-76), with its features of rigid party/state governance structures and the political norm of the collective good, shaped both the evolution of the new institutional framework and the nature of the market in China-in-transition under Deng Xiaoping and Jiang Zemin in the succeeding twenty five years.

What emerges from this micro-level exploration is an institutional view that emphasises that the appropriate structure of property rights is a dependent variable, as opposed to an explanatory variable as suggested by the neo-classical property-rights school. The case studies indicate that ownership and property rights, whether public or private, do not function automatically, but need to be *made* to exist and *enforced* through market institutions such as functioning capital markets and enforceable accounting standards. However, China, as a transitional country, has had to *create* such market institutions from scratch and also to establish social norms of a civil society that by nature were not Chinese in a short period of time. The government played a large role in the creation of market institutions and the implantation of social norms of a civil society with reliance on the extant party/state administrative structure. The case studies show the ‘movement pattern’ of such a historical process, yet this study identifies the Chinese government as creating an economy based on the ‘rule of law’ paradoxically through the party/state process of ‘rule by fiat’.

Given the nature of ‘rule by fiat’ of China’s governance institutions, the case studies highlight the paradox that market-oriented reform often ended up distorting the internal operations of the individual firm and weakening the key institutional mechanisms needed to make corporate governance work. They also highlight that the reform measures aimed at clarifying property rights have never had their desired impacts and have even exacerbated the situation in certain circumstances.

III. Relevance between this research and the current debate on further reform

Twenty years on, China is at the crossroads. At this point, ideology matters. There are two contrasting perspectives. One, the neo-liberal school, which argues that the only organising economic principles are individualism and market forces. The other, the institutional position, which sees markets playing a more limited if legitimate role within the wider social process. The former perspective leads to the arguments that the object of companies should be to maximise profits for their shareholders, portrays the social, collective and public realms as the enemies of prosperity and individual autonomy and thus as opposed to the moral basis of society. Associated with the latter, wealth creation is a social act. The case studies of this thesis show that the collective legacy of China had impacts on the evolution of property rights and ownership arrangements of Chinese enterprises. However, the rights-based reform measures has not only exacerbated the problems of property right arrangements in many cases but also demoralised the collective legacy of Chinese society. It is under such circumstances that overall privatisation has become favoured and lobbied for by the *de facto* class of capitalists of Chinese society that came into being as the result of the redistribution of rights and wealth associated with it through the reform era.

The calls for complete privatisation and smaller government have never been louder than today. However, China’s own experience demonstrates that in a transitional country with incomplete market institutions, there is a strong rationale for state intervention. Although the party/state administrative structure has its embedded conflicts, it has so far remained as the primary force in creating market institutions and ensuring their functioning. Facing apparently inevitable large-scale privatisation

in the near future, there is a need for effective and enforceable state control in such a process to adjust the redistribution of rights and wealth among different social classes in order to maintain social stability. In the light of such a challenge, the insights of Karl Polanyi may provide Chinese scholars and decision makers more enlightenment than those of neo liberalism.

“There was nothing natural about *laissez-faire*; free markets could never have come into being merely by allowing things to take their course. ... *Laissez-faire* itself was enforced by the state. The (1830s and 1840s) saw not only an outburst of legislation repealing restrictive regulations, but also an enormous increase in the administrative bureaucracy able to fulfil the tasks set by the adherents of liberalism. ... ***Laissez-faire* was not a method to achieve a thing, it was the thing to be achieved.**” “This paradox (of the need for a strong central executive under *laissez-faire*) was topped by another. While *laissez-faire* economy was the product of deliberate state action, subsequent restrictions on *laissez-faire* started in a spontaneous way. ***Laissez-faire* was planned; planning was not.**”⁵ (my emphasis)

China’s own experience, as indicated through case studies in this research, is probably one of the best empirical evidences that underpins Polanyi’s rationale. Therefore, policies that may serve the interests of the majority of Chinese in further transition could be something hybrid again, something that does not fit into any mainstream theories, something again ‘with Chinese characteristics’.

⁵ From F. Block and M. Somers in “Beyond the Economistic Fallacy: the Holistic Social Science of Karl Polanyi” in T. Skocpol (ed.) *Vision and Method in Historical Sociology* (Cambridge 1984); cited in a section on Polanyi by Scott Burchill, in Burchill and Linklater (eds.) *Theories of International Relations*, Macmillan 1996):

IV. Structure of the study

The foregoing discussions outline the research concerns of this study. The chapters to follow take issue with those concerns and offer a framework for understanding the institutional change of property rights and ownership in the context of China in transition.

Chapter 1 presents a critical historical review of the changing nature of ownership and property rights in Chinese enterprises in transitional China from 1949 onwards.

Chapters 2 and 3 examine theoretical frameworks for addressing the nature of ownership and property rights. Through a thorough literature review, Chapter 2 traces the formation of the *property myth* in the context of studies on the transitional economy. It questions the basic assumptions of conventional property rights theory in general and challenges their application to transitional economies and to China in particular. Following up the literature review in Chapter 2, Chapter 3, attempts firstly to trace the formation of neo-classical orthodoxy in the studies of the transitional economy inside China and examines the problematic methodology associated with it. Secondly, through a critical review of popular methodology associated with the neo-classical school, it argues the rationale of adopting an institutional approach to the study of change of property rights. Chapter 4 explains the reasons behind the choice of the case study approach as the appropriate research method for this study.

Chapters 5 to 8 illustrate the institutional view on the changes of ownership and property rights through the stories of university high-tech spin-offs in China. In Chapter 5, based upon an institutional approach to change, this study presents the process through which high-tech sectors in China evolved. The study discusses the role of government in fostering China's high-tech sectors through institutional innovation, highlighting the policymaking and management of two major government projects in the post-reform era: The National High Technology Research and Development Programme of China (863) and The Torch Programme. The study argues that the springboard for growth of the high-tech sectors in China in this period was the science and technology and R&D capabilities that had accumulated under

Mao in which the unique ‘government-industry-university’ partnership was originally forged. China’s prior institutional framework allowed government and the universities to engage in activities that have gone far beyond basic research and which have been the early driving forces for product development and commercial adventures in high-tech sectors.

The objective of Chapter 6 and Chapter 7 is to identify the nature of the property rights arrangements of high-tech spin-offs at the start-up stage from the middle 1980s to the early 1990s. The approach of this study focuses on the change of property rights arrangements in the process of the restructuring of institutional constraints on economic behaviour at early stage of transitional reform in China. These chapters adopt specific case study analysis to generate a general understanding of the role of property rights arrangements at the start-up stage of high-tech spin-offs. In these two chapters, the study presents the evolutionary process of university high-tech spin-offs that have been characterized by ‘fuzzy property rights’ and ‘public entrepreneurship’, and through these concepts, attempt an explanation of the ‘path dependence’ of the Chinese high-tech sector.

In Chapter 8, the research observes the change of ownership structure and property rights in the process through which high-tech spin-offs transformed to high-tech shareholding corporations (HPLCs) since the middle 1990s onwards. The findings of this chapter indicate that compared with traditional SOEs, high-tech enterprises were born in the reform era and most were created through unconventional methods in the 1980s with more embeddings of market-oriented non-command business ventures. However, after initial fast development as non-state enterprises, university PLCs re-emerged with features of state owned listed companies after shareholding restructuring in terms of similar identical behaviour, performance and governance structure.

Finally Chapter 9, on the basis of the evidence of the previous chapters, concludes the research findings and contributions, discusses the areas for further research.

Chapter 1: The changing nature of ownership and property rights in the context of China in transition

The people of China have experienced a remarkable if difficult half century and witnessed great changes in Chinese society. Today, as we look back on the last 50 years of economic transition of the PRC, it is clear that while that it has been constrained within “grandiose ideology”(ultimate truth)¹, the process has been conducted largely by ‘trial and error’. It is argued that one dominant theme has been the sovereign role of ideology, and that ideological conformity has constrained economic development (Pye, 1999, p.569). Meanwhile, Lieberthal (1985) argues that another overarching theme - and closely associated with the problems of ideological orthodoxy - has been the constrictive nature of politics which has had to operate within the confines of the intertwined bureaucratic hierarchies of Party and State, allowing the powerful to take economic advantage.

The identification of the above two themes is essential for any understanding of the historical process: the transfer of pre-communist private enterprises to collective and eventually *de facto* state-owned business, and the dominance of state throughout the 1950s-70s. The nature of enterprises was gradually diversified and eventually led to forms of privatisation, but the process was conducted within the evolving dialogue between party and state with the Chinese Communist Party (CCP) remaining at the helm (Oi, 1995, p.1332).

¹ Ultimate truth: Maxims, Leninism and Maoist. *Robert Lifton's thought reform and the psychology of totalism: a study of 'Brain-washing' in China*. New York: W.W. Norton, 1961.

1.1 The changing nature of enterprise in the Mao era

1.1.1 Dominant State ownership

Prior to 1949, the Chinese economy relied primarily on its agricultural sector, and the industrial sector was in its infancy dominated by KMT (Nationalist Party) capital and foreign investment. Chinese national industry was weak.² After the establishment of New China in 1949, the CCP made great efforts to industrialize and eliminate poverty for the purpose of consolidating the party's power and sovereignty over New China³. The CCP selected *socialist transformation* as the path to industrialization: a transformation aimed at building the planned commodity economy based on socialist public ownership⁴.

But how to 'gaizao', - to construct a socialist economic base - was the new challenge for the CCP. The major institutional changes it implemented in the 1950s included land reform and the eventual establishment of communes in rural areas, as well as the extension of public ownership to cover almost all modern sectors"(Wang & Li, 1995)⁵. The main goal during the period 1952-1957 was to nationalize the remaining private industrial firms, with the intention of transforming at least half the capacity of the private industrial firms into joint private-state enterprises, the 'highest form of state capitalism'. The proportion of state and cooperative firms, excluding handicraft

² Contemporary Chinese Economy, Jinji ChuBanshe (Economy Press), Beijing, 1986, p.3

³ The birth of P.R.of China climaxed a century-long drive by the Chinese to reclaim their historical greatness; it signified the re-emergence of a strong central authority after a century of internal strife, civil war and foreign humiliation.

⁴ By the time the Communists took power in 1949, the economy was devastated as Japanese invasion and civil war sapped China for 20 years. There have been periods of famine and upheaval. Two years after Communist rule in 1949, the CCP No.2, Liu Shaoqi, called on the people to 'Struggle for the Consolidation of the New Democracy.' He urged capitalists to build factories and not worry about government intervention. In the countryside, he argued for a go-slow programme for rural collectivization and a 'rich peasant' policy. Liu envisaged a 20-year-plus period of prolonged reconstruction and gradual socialist transformation. Mao, who conceived of the New Democracy policy during the civil war, was enthusiastic at the beginning, but in 1953, at a Politburo meeting, he declared that the main task was to prepare the country for socialism at once. 'Mao always believed that China's revolution was the prelude to world revolution. After Stalin's death, Mao wanted to lead that revolution. So he could not sit idly and just focus on economic reconstruction. he couldn't let capitalism return to China. He firmly believed that global capitalism was on the verge of collapse.'-- Translated from the Chinese text by Mr.Dong Zhenhua, deputy chairman of Beijing University's History Department.

⁵ Translated from the Chinese text by Wang Huijiong, Li Shantong: *Industrialization and Economic reform in China*, New World Press, 1995

cooperatives, and joint private-state industrial firms was scheduled to reach 87.8% of total industrial production by 1957⁶. Another major goal during the same period was the gradual socialist transformation of all commerce⁷. While wholesale trade was nationalized after take-over and 1,000 of the larger industrial companies were converted into joint public-private enterprises by 1954, some 70 per cent of the retail trade and 50 percent of manufacturing industry remained in private hands up to late 1955. But with a colossal campaign to remould capitalist industry and commerce in the short span of just one year, 99.6 per cent of the output of private industry had been taken over by the state, and 82 per cent of the firms in the commercial sector had also been transformed into 'collectives' (Solinger, 1984, pp.308-9).

1.1.2 "Danweilised" enterprises under the Party/State Maoist Regime

The adoption of the Soviet model extended from the introduction of the First Five-Year Plan to the practice of using the 'unit' or *danwei* as the mechanism for social and political control of the urban population (You Ji, 1998, p.3). You Ji argues that strong political and ideological orientation is the first feature of the *danwei* system. *Danweilisation* was compatible with ownership transformation and consolidated the dominance of state ownership as politicisation deepened⁸. Enterprises experienced the process of a workplace becoming *danweilised* as the CCP consolidated power and eliminated political opposition through enforcing ideological commitment. As a result of the 'public-private merging movement', the party assigned 'gongzuo zu' (groups of communist officials) to private companies, incorporated communist members from the worker unions and established party branch within private companies, thus the urban industrial sector was integrated into the infrastructure of the party/state.

⁶ Ibid p.23

⁷ The share of private trade firms declined sharply due to the policy. In 1950, private firms contributed 85 per cent of total trade turnover, State firms 14.9 per cent, state capitalist and cooperative firms 0.1 per cent. In the 1957, the share of private firms declined to 2.7 per cent (significant decline of 96.8 per cent in 7 years); the share of State firm and State capitalist and cooperative firms increased to 65.7 per cent, and 31.6% respectively. Recourse: Ibid p.23

⁸ The party created a monolithic leadership structure in state-owned enterprises supervising and very often replacing factory management at all levels. The command economy is by nature an administrative economy requiring an all-powerful bureaucracy to execute central planning. This has fashioned a unique type of state/enterprise relations which is a feature of a state-owned industrial work unit—its role as an appendage to state administration. *ibid.* p.4; also see Zhou Shuliang, *reform of the planned economy and planning system*

From 1957-1979, the basic policy was to expand state ownership even further, weakening collective ownership and abolishing the private ownership system. Until the state constitution of 1978 legitimated going into business on one's own, private economic operations were proscribed, censured and subject to severe punishment. In 1978, some 77.6 per cent of industrial output was turned out by state-owned firms and the remaining 22.4 per cent by collectives, which were also virtually state-owned⁹

1.2 Diversification of ownership of enterprises in Post- Mao China

1.2.1 The lifting of ideological constraints and the dilution of state ownership

1.2.1.1 The lifting of ideological constraints

At the end of the Mao regime, China was a poor but 'self-sufficient and self-reliant' (*zigei zizu*) country in the sense that she had established and lived on a comprehensive but mostly low-level modern industry after 20 years of isolation from the rest of the world. Mao left his successor a strong country in the political and military sense and the PRC had returned to the United Nations sitting as one of the five permanent members of the Security Council in 1972. However, Mao left the Chinese people a shortage of food and clothing, especially in rural areas.

Most western observers argue that China was facing a macroeconomic crisis at the end of the Mao regime and the country was at the edge of economic collapse. This research argues that China was facing a macroeconomic imbalance as a result of fast industrialisation enforced by an authoritative state. New China's industrial policies and its industrialisation strategy closely followed the Soviet Model¹⁰ - a model based on accelerated development of heavy industry. The development of large and medium-sized enterprises in heavy industry continued to play a leading role¹¹. As a result, until 1978, China's economy was weakly based in agriculture, and the ratio

⁹ 1980 Chinese Statistical Yearbook, Beijing, *Zhongguo Tongji Chubanshe*, 1989, p.267

¹⁰ In the first Five-Year Plan. Moscow funded and provided technical expertise for 150 heavy industrial projects, which became the models in the respective industrial fields.

between primary, secondary and tertiary industries was unbalanced.¹² The research of the time uses the phrase '*qiangguo qiongming*' (strong country poor people) to describe the status of China at the end of the Mao regime. After two decades' dominance of extreme left-wing (*jizuo*) ideology that favoured 'proletarian equality' reaching its zenith in the Great Proletarian Cultural Revolution (1966-1976), individualism was eradicated and people even though living in poverty were not allowed to pursue any individual benefit. Indeed, to some extent, being poverty was glorious under the Mao regime.

At the end of the Mao regime in 1976, China was facing a crisis caused by the apparently irreconcilable conflict between the extant extreme left wing ideology and the growing desperate need of people to get better off (with enough food in rural areas). When a country is facing a crisis, it is more likely to be changed than during a period of stability.¹³ At central leadership level, the crisis was revealed as a political crisis and ended up with reformers taking over power after Mao's death.

The 3rd Plenum of the 11th CCP Central Committee in November and December of 1978 heralded the emergence of Deng Xiaoping as the paramount reform leader in China and the launching of Deng's economic policy regime. Deng Xiaoping's gradualist approach to economic reform, analogised as --"crossing the river by feeling the stones beneath one's feet"--is considered as the revival of Liu Shaoqi's pragmatic 'New Democracy' policy of the early 1950s. Instead of focusing on politics and ideology, the emphasis of the CCP was shifted towards raising the people's living standards and eradicating poverty. As Deng Xiaoping argued, 'Development is the hard truth. Plans and markets are only economic means. They do not form the fundamental distinction between socialism and capitalism.' (Bacani & Heieh, 1999, p.38).

¹¹ In 1979, heavy industries had 98.6 times increases over 1949. By contrast, the increase of light industries, of which most were SMEs, was only 22.8 times.

¹² From 1958-1976, Great Leap Forward programme, three years of famine and the infamous Cultural Revolution of 1966-76 sapped China. 'Mao wanted to combine politics with enterprise. Had the Cultural Revolution not happened, the economic situation would be much better today' --Li Yining, sums up that period in his interview with CNN, 1999.

¹³ Before Deng came into power in 1978, starving peasants from *Feng Yang*, the infamous 'county of beggars', initiated the 'family contract responsibility' system in 1976. The later Communist General Secretary (1986-1989), Zhao Ziyang, then governor of Sichuan, implemented a similar system to end the food shortage.

During the 1980s, ownership by the state was challenged along different paths mainly through adoption of 'capitalistic practices' within the state sector and the steady expansion of non-state, including private, sectors. 'Capitalistic' reforms of SOEs proliferated before 1990, through leasing, began in 1984 and 66% of the small state commercial firms were involved by 1986 (Yue, 1987, p.27 & Sabin, 1994).

Despite these efforts at SOE reform, however, there were reluctant and very limited reforms of governance mechanisms (Putterman, 1995, p.1052-63) and state ownership remained unchallenged. Although 'these experiments posed no threat to the dominant role of public ownership'¹⁴, the cumulative changes¹⁵ throughout the 1980s and early 1990s eventually challenged the state's stranglehold on ownership.

Firstly, Deng's reforms allowed the creation of non state-owned enterprises in the mid-1980s (Dernberg, 1999, p.610)¹⁶. The result was a very rapid growth of output in what became known as the TVEs (township and village enterprises), community enterprises that had a rather mixed ownership involving the local government, former cadres, private individuals and other local enterprises and banks¹⁷. Most TVEs engaged in small and medium sized manufacturing in light industries and niche sectors (less important sectors compared with heavy industries and military & defence industries) which previous central plans and SOEs did not provide for¹⁸. The nature of

¹⁴ *Renmin ribao*, 10 August 1987, p.2

¹⁵ Where in 1985 the state sector was producing 65 per cent of industrial output and the 'individual' or private sector just 1.84 per cent, by 1996 the state's share had plummeted to 28.5 per cent and the private sector's had jumped to 15.5%. In addition, the 39.4 per cent attributed to the 'collective' sector were certainly largely private as well. Meanwhile, a category called 'other', containing foreign-invested industry—amounting to just 1.2 per cent in 1985—had expanded to 16.6 per cent. By the end of 1995, China was the world's 7th largest participant in world trade and direct foreign investment had gone to 233,564 enterprises in China, the foreigner accounting for 40 per cent of the US\$639 billion invested in those enterprises. Source: 1997 Chinese Statistical Yearbook, Beijing: Zhongguo tongji chubanshe, 1997, p.415

¹⁶ After the State Council's 1981 regulations on 'individual' ventures, non state-owned sector usually received official support throughout the 1980s. The political climate eased with the 1987 13th Party Congress's consensus that China was in the 'primary stage of socialism'. The 1988 Seventh National People's Congress legitimized larger private firms by amending the state constitution

¹⁷ Ibid. also see: William Byrd and Qingsong Lin, *China's rural industry: Structure, development, and reform*. New York: Oxford University Press, 1990; Barry Naughton: *Growing out of the plan: Chinese economic reform, 1978-1993*, New York: Cambridge University Press)

¹⁸ By 1985, the TVE sector accounted for 14 per cent of the labour force and produced a gross output equivalent to 30.7 per cent of China's GNP. In 1984-94, this sector's output grew at an average annual rate of 33.9 per cent.

TVEs was largely ‘collective’: a form of publicly owned enterprise regarded as an effective institutional adaptation to the Chinese economic environment (Naughton, 1994:266-270). Mass privatisation was not on the government’s agenda given the ideological circumstances of China at the early stage of reform.

Secondly, as the isolation of China was broken down, in July 1979, the National People’s Congress of China (the NPC) issued the Law of Sino-Foreign Equity Joint Enterprises (*zhongwai hezi qiye*) of the PRC, which subsequently opened the door to foreign investment. In April 1988, the NPC enacted the Laws of the Sino-Foreign Co-operative Joint Venture Enterprises (*zhongwai hezuo qiye*), whereby such joint venture enterprises were allowed. In 1990, the NPC passed the PRC Laws of Wholly Foreign-Owned Enterprises with the effect that wholly foreign enterprises became commonplace. Joint ventures between Chinese SOEs and foreign firms or wholly owned foreign subsidiaries – have established a sizeable presence in the Chinese economy and have dominated in some industries in the past two decades. Foreign Investment Enterprises (FIEs) are owned by separate legal entities and the ownership is diversified, further diluting state ownership.

1.2.1.2 Diversification of state ownership

In the 25 years since the start of ‘reform and opening to the outside world’ (*gaige kaifang*), China has made great achievements in economic construction and social development. In 2003, the GDP was 1.4 trillion *yuan*, an increase of 10 times over 1978. However, the contribution of the state sector to that growth is limited compared with the Mao era. It is clear that the contribution of SOEs to China’s total industrial output has declined significantly in the course of the past two decades. In 1995, SOEs accounted for less than 35 percent of the nation’s industrial output, dropping from over 75 percent in 1978 (China Statistical Yearbook, 1999, p.423).

As indicated in table 1.1, by 1995, the contribution of the collectively owned sector to the nation’s gross industrial output had increased to over 36 percent from approximately 23 percent in 1978. The individual and other non-state sectors (mainly FIEs) produced 16.6 percent of the nation’s industrial output, although they did not

exist in 1978. Collectives, mainly TVEs, provided the dynamos for Chinese reform in terms of employment growth¹⁹ and productivity.

Table 1.1 Gross Industry Output in China (1980-1998)

Year	SOEs (%)	Collective-owned (%)	Individually-owned (%)	Other types (%)
1980	76.0	23.5	0	0.5
1985	64.9	32.1	1.9	1.2
1990	54.6	35.6	5.4	4.4
1995	34.0	36.6	12.9	16.6
1998	26.5	36.0	16.0	21.5

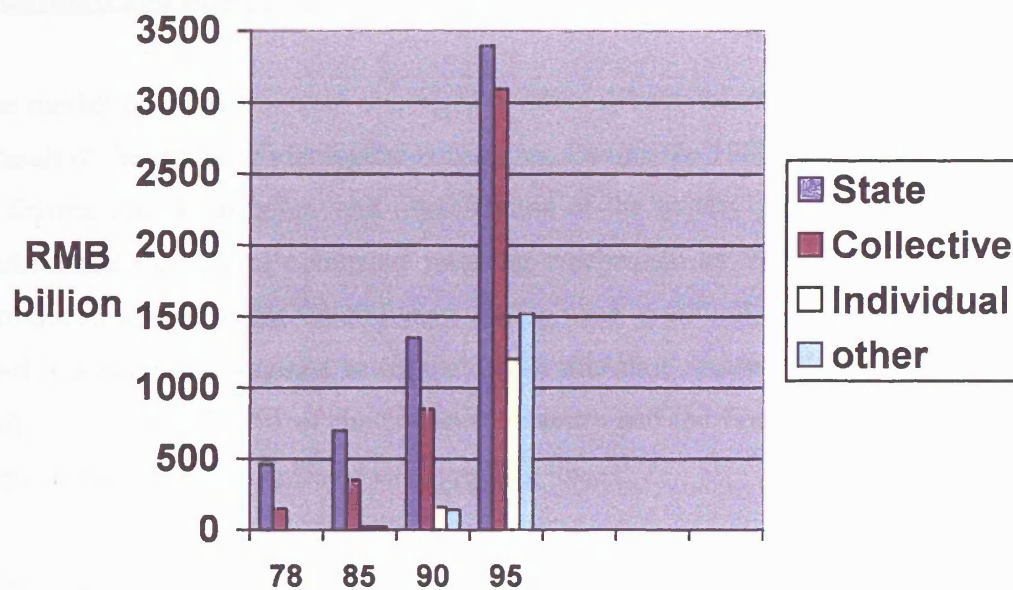
Source: China Statistical Yearbook, 1999, p.423

Academics (e.g. Noughton, 1995) speak euphemistically of ‘the third way’, or, ‘the growth out of plan’, ‘the reform out of privatisation’ presented by Chinese TVEs phenomenal achievements, given the fact that TVEs have kept two digital growth rates throughout the 1980s and 1990s. TVEs employed 7% of rural Chinese in 1978, 11% in 1984 and, at their peak, 28% in 1996²⁰. Thereafter, however, they started declining, cutting jobs and facing losses, too, just like the urban SOEs.

As indicated in Figure 1.1, the phenomenal growth rates of TVEs, FIEs and the individually owned sector suggests that a unitary system of ownership of the means of production by the whole people (*shengchan jiliao quanmin suoyouzhi*) has gradually been diversified and the dominant state ownership has been diluted. However, instead of mass privatisation, gradual diversification became one of the distinctive features of Chinese ownership reform at least in the early stage of reform.

¹⁹ TVEs created employment opportunities mainly in rural area.

Figure 1.1: Output Value of Industry by Ownership, 1978-95



Source: compiled by the author based on China Statistical Yearbook 1999, p.243

²⁰ Calculated with the data from Chinese Statistical Yearbook, 2001, p.110-111: Number of Employed

1.2.2 The hidden privatisation of SOEs: the key link between ideological constraints and enterprise reform

The market-oriented non-state sectors have not only been tolerated but encouraged as a result of the lifting of ideological constraints. During the 1980s, the decentralisation of finance and fiscal policy and liberalization of the unitary price system gradually undermined the central command planning mechanism as the market system was introduced alongside the central plan. SOEs were essentially forced to operate as market economic actors and to compete with non-state sectors. However, compared with the overall take-off of the Chinese economy and the booming of the non-state sectors, the SOEs have suffered ever-growing losses²¹.

There were systematic reasons behind the comparative deterioration of the SOEs. It has been argued (Walder, 1995; Woo, Hai, Jin & Fan, 1994: 410-437), accepted both inside²² and outside China, that the SOEs were forced into the market, yet were uncompetitive owing to ownership constraints. Furthermore, it has been argued that the worsening position of SOEs put the financial position of both the state and the banking sector at risk. The state-owned enterprises were not privatised because, according to this argument, they were retained as one of the remaining means by which China's economy could be termed a 'socialist market economy' throughout 1980s and early 1990s (ibid), as the ideological constraints demanded.

This research argues that in addition to ideological commitment, there were also pragmatic concerns of the government to protect urban SOEs from imminent competitive pressures. As indicated in Table 1.2, over 40% of urban workers were employed by state owned units throughout the 1980s and early 1990s²³. SOEs shouldered the challenges of providing employment and social welfare to a majority of the urban labour force, and thus substantially contributed to the safeguarding of

Persons at the Year-end by Residence in Urban and Rural Areas.

²¹ In 1978 their pre-tax profits per 100 *yuan* of gross output were 24.9 *yuan*, in 1990 were 12 *yuan*, and in 1997 were 10.4 *yuan*.

²² The Chinese decision makers, advised by the most influential policy-consulting group - China Economic System Reform Research Institute regarded the clarification of property rights as the key to state enterprise reform in 1993. (Reynolds: 1987)

social stability in the ‘churn’ of transition. As a result, the most workers benefited from the reform. Farmers benefited from the implementation of the ‘household responsibility system (HRS)’ and the take-off of TVEs which absorbed large amounts of surplus rural labour in the countryside. Thus, solid support for the reform in both urban and rural areas existed in the early stage of reform.

Table 1.2 Number of Staff and Worker by Ownership (million persons) (1984-2000)

	State owned units	Collectively owned units		Units of other types of ownership
		Urban	TVEs*	
1984	86.37	32.16	N/A	0.37
1991	106.64	36.28	96.06	2.16
1995	109.55	30.76	128.62	8.77
2000	78.78	14.47	128.20	19.35

* Number of Employed Persons with TVEs

Sources: compiled by author based on data from China Statistical Yearbook 1992, p.79; China Statistical Yearbook 1996, p.87; China Statistical Yearbook 2001, p.107. China Statistics Press

It is widely believed, that compared with the state sectors which have never truly been faced with a hard budget constraint, threat of bankruptcy or market exit²⁴, it has been difficult for the non-state sectors to access credit from state banks and that the budget constraint is harder for non-state enterprises. Latest research challenges this assertion. Recognising that non state-led (TVEs led) industrial growth has varied geographically, a survey data indicates that vast amounts of bank lending went to non-state sectors in *Zhejiang, Jiangsu, Fujian* and *Guangdong* provinces, in which non state sectors flourished²⁵. Furthermore, in addition to direct bank loans, the non-state

²³ State employment was 17.9% of the total labour force (both urban & rural) in 1984 and it rose to 18.3% in 1989. The state sector in 1989 employed 14.7 million workers more than in 1984, and 26.6 million more than in 1978. (Sachs & Woo, 2003, p.8)

²⁴ Many scholars agree that the ideological constraint is the key factor account for harder budget policy towards non-state sector. Dewatripont & Maskin argue that dispersed banks and decentralized information structures can harden the budget constraint. Qian & Xu indicate that since most of TVEs borrow from small rural credit cooperatives, the budget constrain is harder for TVEs.

²⁵ Non-state sectors in Fujian, Zhejiang and Guangdong accounted for 58 percent, 66.6 percent and 55.4% bank loans respectively in 1998, and the ratio increased 3.3 percent annually since 1990. By contrast, in provinces where non-state sectors contribute less to local economy, less bank credits went for them. Hubei and Huhan province in the middle of China, non state sector-bank credit ratio are 22.5 percent and 26.8 percent respectively, while in five provinces in the North-west China (Shanxi, Gansu, Xinjiang, Qinghai, Ningxia) the average ratio was 19.2 percent, which was obviously lower than the national average level. {Data resource: unpublished survey: *zhongguo shehui kexue yuan feiguoyou*

sector also obtained loans indirectly through informal inter-firm borrowing and lending transactions from state firms. Some observers argue that the actual amount of bank loans flowing into the non-state sector was far more greater than the official statistics, suggest estimates that the actual non-state sectors' bank credit ratio was about 50- 60 percent nation-wide²⁶.

Foreign Invested Enterprises (FIEs), mainly in the form of joint ventures, contributed the major part of the growth of the non-state sector officially classified as 'other' in Figure 1.1. Most prior research has focused on the inefficiency of the SOEs and ignored the fact that SOEs have built up a potentially valuable asset base accumulated over decades and thus has failed to identify the double-edged function of SOEs in the development of FIEs. Because the government explicitly shunned a privatisation stance, the only viable channel for acquiring SOEs assets ended up being via foreign firms. In many joint ventures involving Chinese SOEs and foreign firms, the objective of the venture was not to develop a new product but to shift an existing product line from one Chinese partner of the venture to the foreign firm²⁷. Recent research (Huang, 2000) also suggests that much of the domestically-oriented FDI²⁸ - mainly in capital-intensive industries - does not go toward financing the creation of new capacity but toward financing *acquisition of existing assets of SOEs*.

China's economic reform cannot be cast as a 'national' phenomenon and it has varied geographically. Given the diversified regional institutional context, individuals have initiated many local changes via 'grey channels', not waiting for an official stamp of

jingji fazhan yanjiu ketizu(Research group on non state sector development: China Social Science Institute, 2000)).

²⁶ Given the lack of market institutions at the early stage of the reform, such as the lack of capital market, the lack of finance law, corporation law and the vacuum of supervision, 'grey trading' of policy subsidies between state sector and non-state sectors were rampant. As the result, non-state sector occupied outstanding bank lending, which were *de facto* free-loan, without official identification. However, the performance of the loan, both profitable returns and in most cases bad debts, were merely related to state-owned enterprises.

²⁷ In 1994, China accounted for 49% of the total FDI flows to developing countries and 15% of the worldwide FDI flows. The conventional theory suggests, FDI brings capital and technology to China. Chinese officials, international business press hail China's large FDI inflows as one of the most celebrated achievements of the reform era. However, with the highest savings rate of the world, significant increase of foreign exchange reserve, China has not been short of capital in the 1990s. China's reliance on FDI deepened at the very time when the capital shortage was being alleviated. Furthermore, the industries in China with the largest share of FDI are often those with a low capital and knowledge contents.

approval from the central government. Some localities have expressed their autonomy by nurturing entrepreneurial activity and promoting growth, while others have engaged in squandering public resources and rent-seeking behaviour; some economic actors have changed over time and responded actively to the market while others have not. In this muddy transitional process, SOEs to some extent served as the connecting link between the collective plan and the individually oriented market player. *The latter grew from the ashes of the former.*

The maintenance of SOEs has not only postponed the difficult tasks and unstable outcomes of radical ownership reform, but also has presented an opportunity for ownership change with government accepting a *fait accompli*. This research argues that it was not Chinese policy decision-makers that initiated fundamental ownership reform in the middle of the 1990s (interpreted as the end of 'gradualism' by western observers), Rather the policy makers had to face the fact that non-state enterprises 'growing out of the state sector' had edged out state owned small and medium enterprises in secondary and tertiary industries. They had to accept the result of grassroots changes that had already swept China via semi-official channels that were neither legal nor illegal. The Chinese government did not initiate the end of 'gradualism', it simply recognized and institutionalised the outcomes of 'grey behaviour'.

The watershed in accepting the *fait accompli* came at the 15th Communist Party Congress in 1997, at which President Jiang Zemin put forward two critical tasks, which are to 'adjust and improve the ownership structure,' and to 'accelerate the reform of state-owned enterprises.' "Together these orders amounted to placing an authoritative *imprimatur* upon 'economies of diverse ownership,' such as the joint-stock system, now said to be compatible with socialism just as much as with capitalism" (Fewsmith, 1998, p.252). The non-public sector was switched from being, as it had been since the reforms began, a 'supplement' to state ownership, to serving as 'an important component part of China's socialist market economy. Meanwhile, the 'public,' as differentiated from 'state' ownership, still hailed as 'the main

²⁸In the 1990s, FDI originating from Hong Kong and Tai Wan accounted for 50-79% of total FDI and much of them were originally domestic state money that had been transformed via 'grey channels'.

component’ of the economic system, now included not just the state and collective sectors but also the state and collective’s share in the ‘mixed economy’.

The 15th Party Congress commanded ‘*zhuada fangxiao*’, involving the widespread privatisation of the smaller SOEs, and the closure of the most inefficient. However, the state sector was to remain dominant in heavy industry and other sectors dependent upon the primary inputs produced by state-owned enterprises. As discussed in the following sections, these sectors were those well governed within the extant system and thus left little space for using SOEs as a connect link for arbitrage. The remaining state sectors were officially addressed as ‘pillars’ of the national economy. The figures indicated in Table 1.3 certainly support the view that the state sectors were ‘pillars’ of the national economy in terms of their taxes contribution to the country.

Table 1.3 The Economic Significance of the Private Sector in terms of taxes contribution

	1996	1997	1998	1999
Percentage of industrial and commercial taxes by the private sector in total industrial and commercial taxes (%)	1.11	1.31	2.14	2.63

Sources: Adopted from John Wang and Zheng Yongnian (2002), *China’s Post-Jiang Leadership Succession – Problems & Perspectives*, Chapter 3 Technocratic Leadership, Private Entrepreneurship and Party Transformation by Zheng Yongnian p.101.

Zhongguo siying jingji nianjian [The Yearbook of Private Business in China, 2000], and *Zhongguo shuiwu nianjian* [The Yearbook of Taxation in China, 1994-97]

As market forces have swept over China, the country cannot avoid social and economic turbulence – “the churn”, an idea adopted from thoughts of the ancient Chinese philosopher *Laozi*. The Churn - China’s transition - is analogous to the *creative destruction* (Schumpeter, 1975) that occurs as a process of knocking down old systems, deeply painful in the short run, but with handsome pay-off in the long run.

At the end of the Deng era at the end of 1990s, China remains a socialist country, yet one with a vast non-state sector. It is a nation with few ‘private’ firms but millions of ‘non-state’ firms. The country maintains ‘public ownership’ over ‘rudimentary, pillar’ industries, but not necessarily ‘state ownership’. State firms are owned by ‘the

people', yet sell shares to individuals in Shanghai, Shenzhen, Hong Kong, and New York.

1.3 Evolution of new agency problems associated with gradual enterprise reform of the state sector in the 1980s

1.3.1 The problem of incentives

China's reform, conducted largely by trial and error, has been repeatedly contrasted with neo-liberal shock therapy. As a result of isolation from the west and ideological commitment to orthodox Marxist theories of political economy for the first thirty years of the Peoples Republic's existence, the influence of western economic theories was limited and constrained in official discourse in the early stages of reform. And changes continued throughout the 1980s without a great deal of strategic research and systematic analysis ('crossing the river by feeling the stones'), largely involving a 'bottom up' process emphasising the importance of local conditions and initiatives as the key determinants of transition.

Lifting and relaxing the ideological constraints associated with Maoism over the last twenty years encouraged local tests and trials which, once perceived as serving the principles of economic prosperity and social stability, were pragmatically authorised and legalised by the Party/State.

The initial reform originated - without any theoretical discourse - at the grassroots with the reintroduction of individual incentives in the countryside. The groundbreaking experiment of introducing the household responsibility system (HRS) in rural areas in 1978 was initiated by farmers in Fengyang County in Anhui province. However, once the government authorised and legalised the trial, it spread rapidly. And following the rural reforms, China's urban state sector reform began. This started by 'releasing rights', reintroducing incentives and by the installation of market mechanisms within the domain of the command economy initially through a dual pricing system.

At the macro-economy level, market pricing for industrial products expanded in the early 1980s. By the second half of the 1980s the share of market allocation of resources had increased dramatically and market prices for industrial goods were common²⁹ (Byrd 1992, p.7).

Table 1.4 Market vs. Regulated Prices, 1990-94 (%)

	Fixed prices	Guided prices	Market prices
1990	44.6	19.0	36.4
1991	36.0	18.3	45.7
1992	20.0	N/A	80.0
1993	15.0	5.0	80.0
1994	14.7	5.3	80.0

Source: IMF (1996)

Along with the introduction of market prices, government instituted a series of micro-level enterprise reforms by extending the independence and enlarging the decision-making powers of SOEs from the late 1970s. The first incentive reform was a *Profit Retention Scheme*, which was locally piloted in mid-1979. This policy initially allowed enterprises to retain a share of the profits from any above-quota production. This initial reform was facilitated by a strong government-led ‘movement’ with reliance on the administrative controls of the party/state. By the end of 1980, 6,600 industrial SOEs, accounting for 60% of total industrial output and 70% of total profits had adopted some form of the scheme (Byrd, 1992)³⁰.

However, incentives remained weak because of low retention rates. Given that the determination of rates between enterprises and the supervisory bodies was soft and negotiable, the scheme also introduced uncertainty and thus created ‘grey areas’ of

²⁹ The share of consumer goods sold at market price was only 3% in 1978, it increased to 53% in 1990 and to 94% in 1993.

³⁰ Naughton describes the characteristic of China’s reform with significant government involvement as ‘growth out of plan’. Although China lacked a well-defined strategy or a clear blueprint of reform, deliberate efforts were made early in the reform process to align government incentives at all levels with the new political focus on economic development. The ability to foster economic growth and development became the main criterion for promoting cadres (Frye & Shleifer 1997; Walder 1995). As a result, the extant bureaucracy was not only not eliminated but was directly involved in economic

governance allowing enterprise managers and supervisory bureaucrats to plunder public resources for vested group gains.

In 1981-82, the Economic Responsibility System was implemented and a set of contract-based relations was introduced. According to this system, the enterprise had to hand over only contracted amounts of profit, reinforcing incentives with high retention rates allowing the enterprises to retain above-quota profits up to 100%.

In 1983, the enterprise profit remittances scheme was substituted by tax payments. The aim of this reform was to replace the direct government-mandated administrative supervision of enterprises with indirect government supervision and a more market-oriented tax system. However, the tax rate was set at a uniform level of 55% for all SOEs and given the distortions of the dual-track price system and the significant variance of profit levels within different industrial sectors, the government had to rely on direct mandate administrative control to adjust tax rates to different sized enterprises in different industrial sectors in order to secure its tax revenues.

In 1987, the performance contract reform was introduced in China. There were various forms of performance contract ranging from the leasing of smaller firms, contract responsibility systems, enterprise management responsibility systems and asset management responsibility systems that were implemented at local level. Regardless of the variety of forms, the essences of these schemes were to establish contract-based relations between director and supervisory agency and performance-based relations between director performance and enterprise performance. As a result, essential control rights and enterprise autonomy were granted to directors.

The early reforms were intended to improve the efficiency of state ownership and the introduction of incentives in the 1980s successfully decentralised the organisational structure of the state sector³¹. In addition to decentralisation, state firms were transformed from mere 'production plants' to more corporate-like organisations and

reform. Talking only about 'what is achievable and acceptable' within the extant bureaucracy (has) its pragmatic virtues and saves a lots of political costs (Gang Fan, 1999).

their heads from mere obedient directors³² to more active entrepreneurial managers. However, the incentives to improve the efficiency of resource allocation remained weak while the incentives for personal aggrandisement grew.

1.3.2 Predatory behaviour

Although highly disciplined central administrative control was not efficient in resource allocation and smothered incentives, the upside was the limitation of grassroots corruption: not only was it ideologically unacceptable but management had little freedom to make discretionary decisions in any event. Managerial expropriation of public assets at the firm level was thus systematically constrained. The governing mechanism primarily relied on the interwoven party/state hierarchy and the organisational structure of the *danwei*, which were command-based and obedient by nature. The ‘political movement’³³ of the time thus played a crucial role by ingraining ideological morality and commitment into the system.

The enterprise reforms of the last years can be summarised as a gradual shifting of control rights and of residual claims from the government to the firm level. The reforms started with no intention of abolishing state ownership, merely to improve efficiency within it. The reforms aimed at introducing incentives and infusing local enterprises managers with entrepreneurial spirit but the incentives granted rights of control to enterprise directors without changing the essential mechanisms of state control. The dilemma was that the command mechanism relied on ideological commitment associated with suppression of individual incentives³⁴. Once the

³¹ The state sector was effectively organized like a single giant company with almost all decisions, including those of production, investment and employment, centrally planned. Revenue and cost budgeting were also centralized by the state treasurer (Wu, 1994).

³² In the planned system, the director, normally the party secretary, was nothing more than a special worker, whose main task was to coordinate and supervise ordinary workers to implement the production plan made by the government. All inside members of the enterprise were compensated through a centrally set hierarchical wage-fringe benefit system, which was little related to firm performance. (Zhang, 1993).

³³ The history of China under Mao can be summarised as a series of ‘political movements’ through which the concept the ‘private’ (*si*) was politically eradicated. The slogan of the time was ‘give no thought to self’ (*da gong wu si*).

³⁴ Most researches on the corporate governance in China emphasise that the market-oriented CG is rule based while the command control is relation-based. We argue that networking exists in both systems, the difference being the constraining force restricting ‘buddy’ cronyism is weaker in the former system.

ideological constraints were lifted with nothing to fill the gap, however, incentive reforms unleashed all sorts of predatory behaviour from the grassroots to the centre.

In many cases, reforms which aimed at introducing incentives often played a role to the detriment of effective enterprise governance. Plenty of empirical studies show that, on average, performance reform did not improve performance (Shirley & Xu, 1995). The minority of performance contracts which were successful were associated with good supervisory design with reliance on the existing command-and-control regime and featured stronger incentives, longer terms and managerial responsibilities in more competitive industries.

The dual-track system, alongside trial-and-error economic liberalisation which continued to allow unconstrained 'rights' to state agents, created uncertainties and thus more opportunities for expanding and justifying the use of public resources for vested group gains. The bottom-up style of reform encouraged and emphasised the 'trial' while the bureaucratic incentives neglected the 'error' that was often encountered in the process. Without a clearly defined framework and monitoring procedure, the various forms of performance reform 'trials' consequently weakened the incentives that were introduced.

A major contributing factor to the persistence of predatory behaviour of vested interest groups was the efforts of the state to justify it. State agents often opportunistically used the acceleration of economic change as a means of justifying their attempts to expand their own interests (Lin & Zhang 1999, p.211-226). Instead of recognising the problems that were created in the early profit retention reform schemes, performance reform made the enterprise governance problem significantly more complex. With diminishing ideological commitment and deteriorating discipline the command administrative system was incapable of constraining the rampant predatory behaviour that was involved in the process.

As Wu (1995) has indicated, the adoption of the dual-track price system created a range of opportunities for corrupt arbitrage of consumer goods and industrial materials throughout the 1980s. In this process, along with the rapid development of

non-state economic sectors throughout 1980s³⁵, the extant bureaucracy became closely tied to the emerging class of property owners and entrepreneurs.

With the troubled state sector facing a web of new agency problems created by the performance reforms of the 1980s, the need to establish functional enterprise governance became evident. Formal law or legal regulations governing industrial SOEs were not launched until 1988. The relations between creditors, investors and managers were still handled through internal administrative procedures since the three parties remained state bodies holding parallel administrative power. As a result, the extant command-based administrative system of control was trapped in a vicious circle: 'liberating administrative control resulted in chaotic arbitrage, tightening up the control resulted in deadlock of reform'³⁶. Thus the necessity of establishing a new enterprise governance system and making it function became clear. Some scholars even argue that Chinese corporate governance reform was initially designed primarily to address the problems within the state sector described above (Jiang, 2000, p.21; Wang, 1999, p.135).

In general, in the process of transition from the plan to the market, there has been increasing demand for new laws, regulations and other market-oriented institutional arrangements. In addition to grassroots trials, the borrowing of the market-oriented mechanisms and other countries' reform experience in a pragmatic fashion has been a distinctive characteristic of China's transition. And the reforms of the 1980s not only re-introduced capital markets but also created a *de facto* labour market³⁷ and thus laid the preconditions for the introduction of corporate governance.

³⁵ Research conducted by the Chinese Academy of Social Science shows that a significant amount of SOEs' debts (mainly to State banks) has actually been leaked into the non-state sector through various sub-lending channels. The phenomenon has been most rampant in provinces where the non-state sector developed fastest.

³⁶ Author translated from Chinese saying that described the phenomenon which was '*yi fang jiu luan, yi shou jiu si*'.

³⁷ Many performance contract schemes granted managers the autonomy to hire temporary labour, often cheaper labour from the countryside (for further discussion on this phenomenon, please see section 2.1). Fixed contract for workers, first introduced in 1986, replaced the lifelong 'iron rice bowl' in SOEs. Under this new scheme, workers whose performance was unsatisfactory could be fired when their contracts expired. In practice, large scale redundancy of SOE workers took place only in the middle 1990s and afterwards; in principle, the breaking of the 'iron rice bowl' fundamentally challenged the workers' ideological *status quo* of being 'masters' of SOEs and labour was re-accepted as a commodity in official discourse.

1.4 Diversification of ownership and the question of corporate governance

In order to tackle the rampant predatory behaviour associated with the performance reform and to save the SOEs from sinking, there was a need of creating a functional governance mechanism to defend the ownership and property rights of the state over SOEs. Meanwhile, with the fast development of diversified ownership enterprises and further introduction of market incentives, the extant command governance mechanism was in straitened circumstance. Learning and borrowing from other countries' lessons and experiences was an important part in the reform of governance structure.

The influence of creative borrowing over the shape of reform policies has become gradually more significant since the late 1980s as a result of China's integration into the mainstream world economy. And the borrowed theories which have had the most profound influence on China's recent reform practice at the firm level are those of neo-classical property rights theory and the shareholder-oriented corporate governance mechanisms associated with it.

1.4.1 Clearly defined property rights and the question of corporate governance

One of the most popular debates associated with transitional economies concerns the most appropriate assignment of ownership and property rights. Conventional, neo-classical economists regard *clearly defined property rights* as a necessary condition for the 'efficient' operation of the market. This school widely believes that the free market operating through the price mechanism and girded by well-defined private property rights provides the incentive precise structure needed to achieve efficient resource allocation and growth. They conclude that transitional reform faces a choice between restructuring ownership rights on the basis of market forces or administration decisions, and that market forces bring positive flows while administrative decisions bring negative ones.

According to this school, a lack of any change in public ownership played a negative role in China's early performance reform and led to the range of new agency

problems discussed above. Thus, with the growing influence of this school, the grassroots-reform discourse was replaced with the academic rhetoric of ‘clarifying ownership and property rights’. As a leading Chinese economist Zhang Weiying (1998, p.16) indicated: “although the modern theory of incentives was introduced into China *much later*, the pre-reform Chinese experience seems sufficient for both Chinese economists and reform-minded leaders to understand how essential the incentive system is for economic performance, although it has come *much later* for them to understand that the incentive system is primarily dependent on property rights and ownership structure” (my emphases). As a result, the official discourse of transitional strategies and practices of enterprise reform since the early 1990s has increasingly focused on the reform of ownership and property rights. Indeed, it is interesting to notice that in the 1990s Chinese academic discourse embraced the ‘property myth’ with enthusiasm when it was being radically challenged both in theory and practice in the west³⁸. Ironically, as this thesis explains in section 1.4.2 below, it is the experience of the Township-and Village Enterprises (TVEs) of China which is frequently quoted by western scholars as the greatest challenge to conventional property rights theory.

Since the late 1980s, Chinese firms have been adopting a number of economic strategies and practices that resemble the rational bureaucratic systems found in corporations in advanced market economies. After the local pilots in shareholding initiated in 1984, the key discourse of reform in 1990s was the transition to a shareholding system officially termed the ‘modern enterprise system’. The stock exchanges were officially open in 1991 and other macro social, economic and legal reforms were strongly enforced by the government to establish frameworks based on the advanced market economies of the west. The Civil Procedures Law of 1991 introduced rudimentary provisions for the bankruptcy of legal persons in general and the Company Law came into force in 1993 by which enterprises could assume the legal form of corporations. Thereafter the institution of corporate governance was introduced as the core of modern enterprise reform to deal with new agency problems

³⁸ Regarding the discussion on the ‘property myth’, Stiglitz (2002) once argued: “This (property) myth is a dangerous one because it has misled many of the countries engaged in transition to focus on property rights issues rather than a broader set of issues.... I have explained...resolving property rights is certainly not sufficient, and may not even be necessary.”

created in the previous reform of corporatization and ownership diversification. The dominant discourse of China's enterprise reform subsequently shifted to the purpose of establishing corporate governance institutions that were compatible with the changing nature of ownership in order to define property rights and exercise corporate control.

In the 1990s, 'top-down' market construction and transformation (Fligstein 1996, p.656-73) replaced 'bottom up' forces, allowing the state to shape the dynamics and structure of the markets that emerged under its guidance. But questions remained. Could a functioning market economy, the likes of which emerged through a long process of evolution within western capitalism (Chaudhry 1993, p.245-74) be created overnight and enforced in China 'by design' (Murrell 1992, p.79-95, Stark 1992, p.7-54). And in any event, how closely *should* economic institutions conform to models provided by western European or North American capitalism?

1.4.2 The embedded conflicts of adopting corporate governance in a transitional economy

Mainstream corporate governance arguments are based upon the assumption that self-regulated business incentives would generate an efficient legal and regulatory framework while empowered capital market regulators would be capable of enforcing the rules. According to the World Bank (1999, p29): corporate governance comprises "the set of instruments and mechanisms (contractual, legal, and market) available to shareholders for influencing managers to maximize share-holder value and to fixed claimants, such as banks and employees, for controlling the agency costs of equity". This definition is compatible with the neo-classical theory that property rights are essentially the power of the residual claim on an asset. Thus corporate governance institutions and mechanisms include the board of directors, direct shareholder activism, elaborate contracts, a bankruptcy system and a reliable critical information disclosure structure.

According to conventional theory, the essence of corporate reform in transitional economies is to replace command-and-control with a set of contracts to solve the problems of governance associated with the incentive structure, monitoring and

asymmetric information. A set of contracts *per se* is not sufficient to automatically exercise effective control. Only in combination with a range of mutually constrained and *institutionally enforceable* corporate institutions and mechanisms would corporate governance allow effective corporate control. Aoki (1984) explains corporate governance from the aspect of game theory. He argues that corporate governance consists of groups of strategically interactive groups who are concerned only with their own interests and that effective corporate governance involves a *self-implemented* mechanism reflecting the strategic interactions among the participating groups. As a result corporate reform in transitional economies should minimise the role of government as far as possible.

The evolution of corporate governance in China has been shaped by the endogenous necessity of 'corporate' development and the exogenous interference of institutional constraints. Regarding the fundamental conflict between the institutional structure of conventional corporate governance and the institutional matrix of transitional China, it has been a process of compromise and integration, rather than mere transplantation, of corporate governance institutions into endogenous corporate development.

There are two fundamental conflicts - the conflict of 'principle' and the conflict of enforceable mechanisms. First, conventional corporate governance defines the interests of capital as the residual claim rights of equity investors: shareholder value is the 'principle' that the institution serves. Corporate governance is therefore an internal set of rules which defines and adjusts the relationship between shareholder (owner) and management (controller). However, this shareholder-value perspective is implicitly in conflict with the broader corporate governance perspective based on stakeholder-value which emphasises the coordination of the benefits of all involved parties including shareholders, employees, the community, government and environment, by a set of internal and external rules³⁹.

³⁹ Monks and Minow (1996)'s corporate governance definition describes the corporation's interaction with "internal" as well as "external" stakeholders. It refers to a set of rules/institutions/practices that minimizes the agency cost and the divergence between social and private returns on corporate activity.

Moreover, conventional corporate governance also neglects the role of labour. Yet while reform in the 1980s prepared the ground for the establishment of shareholder-value corporate governance with the re-introduction of capital and labour markets, maintaining public ownership as the dominant form of ownership remained a central political concern in the implementation of reform policies from the 'four cardinal principles' spelled out in 1979 to the blueprint of the 'socialist market economy' presented at the 14th Party Congress in 1992. There is embedded conflict between the legacy of collectivism and the rationale of individual efficiency. The reform and transition of China, characterised by gradual decentralisation and diversification of ownership has necessitated a class of property owner (capitalists) and shareholder institutions growing out of a 'collective society'. But the legacy of an egalitarian command society, with a range of appropriate political and economic institutions and ingrained social norms, has constrained the formation of shareholder-oriented corporate institutions. Strengths and weaknesses of corporate reform in China result from these embedded conflicts entailing a power struggle between different interest groups.

Second, regarding the conflict of enforceable mechanisms, it is the 'rule of law' that defines the domain of corporate property and the rights of corporate control. However, up until the 1980s, the command economy of China relied exclusively on administrative mechanisms whilst law played an insignificant role. The concept of 'rule by fiat' was ingrained in the governing institutions and social norms of China and continued to have a powerful influence after the reforms began. I argue that 'mass mobilisation' by fiat has always been used to serve the rapid spread of reform policies in China. In so doing I identify a key dilemma: attempts to achieve corporate transformation with the aim of ultimately establishing the 'rule by law' have continued to be implemented by the political-administrative institutions with heavy reliance on the extant mechanism of 'rule by fiat'.

Effective corporate governance has taken more than a century to evolve in a relatively small number of market-oriented developed economies. It has developed in socio-economic settings that have little in common with China in transition. Can the institution of 'command regulation' be easily replaced by a market-oriented law-based set of contracts through government-shaped reform? Can 'a set of contracts' become

effectively *self-enforcing* within the context of the gradual reform of the institutional command-based framework?

1.5 Transitional enterprise system with Chinese characteristics

The co-operative shareholding system developed in complicated socio-economic settings of China in transition. Cooperative shareholding systems were piloted by farmers in Wenzhou, Taizhou, Zhejiang Province and by TVEs managers in Zhou Cun village in Shandong province in the 1980s (Zhou, 2000, p.49-53). These involved 'bottom up' grassroots initiatives introduced by TVE managers and local politicians to deal with a range of problems that were created by the fast growth of TVEs and often associated with the distribution of accumulated wealth. After the pilot was officially accepted, cooperative shareholding was widely introduced as the key corporate reform for both TVEs and small and medium sized SOEs in the 1990s.

1.5.1 Co-operative Shareholding – an institutional innovation

Various forms of co-operative shareholding system have developed in different regions and there has been neither standard organisational structure nor relevant laws to formally institute the system. The divergence between central government regulations and local government rules was frequently significant. As a result, the forms of co-operative shareholding systems not only remained diverse but also caused confusion in their definition (Kong, 1996, p.137). Regardless of the diversified forms of the system, the enterprises under the identity of co-operative shareholding had (and have) primary features in common: (1) there is no division of interest between capital and labour within the enterprise given the equal distribution of shares between the capital contributors and labour providers, (2) the capital structure of the enterprise is composed mainly of indivisible collective public shares and insider (internal) individual shares: the enterprise emphasises the accumulation of the collective reserve, (3) in terms of the residual claimant, both the capital investor and the labour contributor are entitled to residual rights and (4) in terms of corporate control, the

enterprise adopts the principle of combining the mechanism of one employee one vote with that of one share one vote.

The co-operative system is a form of enterprise structure that has existed in advanced market economies⁴⁰ yet has never been the dominant form either in the west or in China. As indicated in table 2, co-operatives and co-operative shareholding remain as compromises between the more extreme systems of collective and private shareholding. Cooperatives are closer to collectives in that they emphasise the interest of labour, while co-operative shareholding is closer to private shareholding in that the interest of capital is given greater consideration even if constrained by the presence of the labour force as a part residual claimant and corporate controller of the enterprise.

Table 1.5: Different ownership and governance structure

	<i>Private <u>Shareholding</u></i>	<i>Co-operative <u>Shareholding</u></i>	<i>Co-operative</i>	<i>Collective</i>
Share structure	Individual share	Collective public share & Insider individual share & Limited outsider individual share	Collective public share & Insider individual share	Collective public share
Individual share	Non-limited amount	Limited amount	Limited amount	none
Residual claimant distribution	On the basis of capital contributed	Mainly on the basis of capital & On the basis of labour as supplementary	Mainly on the basis of labour & On the basis of capital as supplementary	On the basis of labour contributed
Residual claimant control	Individual shareholders	Collective	Collective	Collective
Corporate control	One share one vote	One employee one vote & One share one vote	One employee one vote	One employee one vote

Source: translated and compiled by the author from Li linong (2000, p. 77)

⁴⁰ According to the International Co-operative Association, the co-operative principles are as follows. 1). Voluntary membership 2). Democratic management in term of one employee one vote 3). The absence of share dividends 4). Co-operative education 5). The promotion of domestic and international co-operation, 6). Indivisible reserves. (Li linong, 2000, p.76)

The innovation of the cooperative shareholding system integrated China's ideological commitment to public ownership with a mechanism defining capital interests and defending individual property rights. In theory, this innovation combined the strength of the private shareholding mechanism with that of the co-operative whilst clarifying the property rights of parties involved in the enterprise. It also theoretically provided a solution to the implicit conflict between shareholder and stakeholder embedded in the shareholder perspective of the corporate governance mechanism. According to the theoretical design, the distribution of shares between capital investors and labour is the basis for democratic management within a co-operative shareholding enterprise. In addition to capital constraints on labour behaviour, the mechanism empowers employees to restrict managers' behaviour as well. In terms of its emphasis on the role of labour, the co-operative shareholding system introduced in the Chinese countryside by farmers and TVE managers had common features and similar objectives comparable to the *Employee Stock Ownership Plans* (ESOP) arrangements in shareholding companies in the advanced market economies.

The co-operative shareholding system was widely adopted in the 1990s after the local pilots had been authorised by the government. However, the rationale for adoption varied significantly in different sector and regions. For those co-operative shareholding enterprises transformed from individual or co-operative businesses, the economic rationale was to raise capital by ceding shares to employees. The political rationale was an opportunistic defence of private property rights by registering the individual business with a 'red hat'⁴¹. The co-operative shareholding system was legalised by the government as a diversified form of public ownership and thus gave it a perfect 'red hat' to wear. According to a survey in Zhejiang province in 1993 (Zhou, 2000, p.49), among 90 companies registered as co-operative shareholding companies, 86 of them were owned by 2-3 shareholders while only four were owned by all employees. Those companies owned by 2-3 shareholders had the choice of registering as joint enterprises or as shareholding companies, but, in order to defend private property rights, they all chose to register as co-operative shareholding enterprises.

⁴¹ Red-hat: a well known Chinese saying refers to those individual businesses which were officially registered as collective organisations.

Neither the clarification of property rights nor the enhancement of efficiency was the rationale for their choice.

The primary rationale for collective enterprises to adopt the co-operative shareholding system was the clarification of property rights. For those collectives that had developed successfully in the early stage of the reform and had accumulated wealth, there was the problem of equitably distributing the collective fortune. For those collectives in the red, there was the need to target the new agency problem created in the previous performance reform by selling shares to employees, *internalising* accumulated debts and defending the collective property rights in this way. Under both circumstances, the collective legacy and the norm of the worker as ‘master’ of the enterprise shaped the formation of new corporate structure. It was ideologically and practically unrealistic to transform the collective directly into a shareholding enterprise. But by transforming employees of the collective into employee-shareholders of the co-operative shareholding enterprise, it integrated labour with capital as owners of the enterprise: employees thus retained their ‘master’ status while the power and interest of capital could be introduced into the enterprise. Shu Hualu (1998) argues that the adoption of the co-operative shareholding mechanism was by nature a compromise between capital and labour in the transition process. And thus efficiency *per se* was not the rationale for the transformation of the collective into a co-operative shareholding enterprise either.

1.5.2 The practical outcomes of the co-operative shareholding system

Radical debates have taken place over the rationality of co-operative shareholding since it was proposed and piloted. Its supporters regard it as an innovative corporate governance mechanism in tune with the characteristics of the Chinese socialist market economy. Its critics argue that it is merely an unsatisfactory half-way house on the road to (the more desirable state of) full private shareholding. They argue that the distribution of shares amongst workers weakens the incentives of managers and increases the constraints upon them while democratic management associated with the principle of one employee one vote hampers the efficiency of the decision making process and leads to missed business opportunities. It is difficult to determine which issues concern employees (and which therefore have to be decided at the workers’

conference by one person on vote), and which issues are operational (to be decided at shareholders' meetings by one share one vote). The critics also argue that employee share arrangements affect the efficiency of the enterprise in that since shareholding employees are primarily interested in the distribution of dividends, once they had recouped their initial investments, their incentives to monitor company performance are reduced⁴² (Yang & Qiao, 1997). Indeed, it is arguable that local government policies largely chimed with the views of the critics and thus often favoured director/manager control of co-operative shareholding enterprises with the argument that concentrated director/manager shareholding would improve the efficiency and competence of the enterprise.

In practice, shares of co-operative shareholding enterprises quickly shifted from employees to managers. In Zhoucun, Shangdong province, the pilot area, shares began to transfer to managers when the second stage of co-operative shareholding reform was completed by the end of 1994. In 1995, managers of these transformed enterprises held shares in the enterprise worth on average 14,170 *yuan* but by 1997, the figure had risen to 98,000 *Yuan*. By contrast, the average shares held by middle technicians only increased from 4,560 *Yuan* in 1995 to 8,548 *Yuan* in 1997. In Zhejiang province, the local policy encouraged managers to hold the majority shareholding in transformed enterprises while the director of the board and general manager were encouraged to hold shares to a value of at least 5 times that of the employees⁴³. In Wenzhou, Zhejiang province, where the mechanism was introduced, shares were concentrated in a handful of managers and board directors in almost all transformed enterprises (Zhou, 2000, p. 49-53).

After the enactment of the Company Law in 1993, the shareholding system was accepted as a key corporate form of the socialist market economy and as a result, the number of 'red hat' co-operative shareholding enterprises significantly decreased and the number of individual business and collectives choosing to register as shareholding enterprises directly grew sharply (Li, 1998; Zhang & Huang, 1999). The presence of

⁴²Some of well-performing enterprises distributed all their profits. According to a survey in Zhucheng, employees were not motivated to monitor enterprise performance and they felt that their influence on the enterprises decision making was limited, either as worker or shareholder.

⁴³ In fact, it was not unusual to find that managers held more than 20 times of the employees.

this transitional form eventually retreated and was replaced by a full shareholding enterprise system.

By adopting co-operative shareholding, the collective was *de facto* privatised as 'insider' managers took over the control rights through concentrated director/manager shareholding. In the process of transferring public property and assets to individuals, the 'co-operative' identity was adapted for the purpose of facilitating the promotion of *private property rights* (in contrast to individual property rights owned by all employees of the enterprise). Thus, in the process, employee shareholding became the medium by which 'master' labour was wholly transformed into a tradable commodity and labour lost its rights to ownership of the enterprise.

Small and medium sized SOEs also adopted co-operative shareholding, preparing them for *de facto* privatisation once any remaining ideological constraints were lifted. The links between labour rights and ownership had the potential of making transformation more costly, as workers had to be compensated in some way. However, the method of transforming labour rights into shares not only made the 'privatisation' possible within the extant ideological and political setting, but also significantly reduced the cost of the ownership change by internal concentration of the director/manager shareholding.

This 'insider-centred' diversification of ownership of small & medium SOEs became politically acceptable in the 1990s, especially after the 15th National Congress's new strategy of 'controlling the large and releasing the small'⁴⁴ and took a variety of forms. But the 'releasing of the small SOEs' through ownership diversification was implemented as a nationwide *movement*, regardless of the significant regional divergences in social and economic progress. The scale and the methods of diversification across the country displayed a similar size and pattern⁴⁵. As table 1.1 indicates, different localities followed very similar procedures.

⁴⁴ Only a core of strategic industries – such as communications, power, heavy industries - are likely to remain entirely in state hands.

⁴⁵ As of November, 1998, Liaoning Province, in the northeast, formerly a base of state industry and conservative thinking, had shed 60% of its small and medium-sized state companies (SETC, 1999). In Sichuan, the provincial government embarked upon a restructuring programme in 1994. By the end of 1998, the process had been completed for 69% of the 42,681 firms in the programme. Among those

Table 1.6: De facto privatisation of small & medium sized SOEs in 1990s

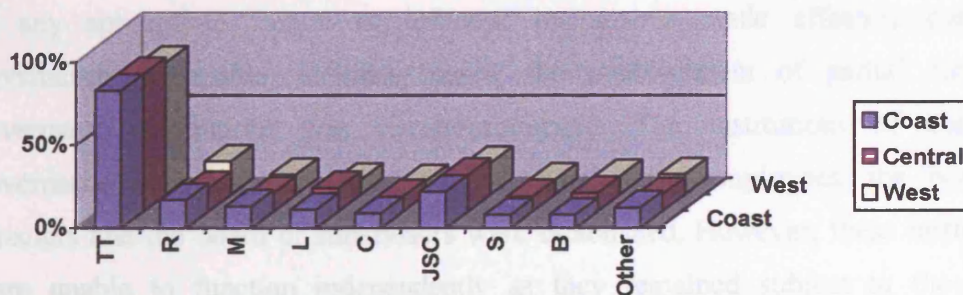
Region	No. of Firms	Transf ormed (%)	Method (%)							
			R	M	L	C	JSC	Sale	B	Other
Coastal	17,629	83	17	13	11	9	22	8	8	12
Central	20,713	83	14	11	14	9	22	9	11	10
West	21,068	80	20	12	9	8	19	9	11	12

Coastal: coastal provinces; Central: central provinces; West: western provinces

R-restructuring, M-merger, L-leasing, C-contracting, JSC-joint-stock company, B-bankruptcy⁴⁶

Source: The State Economic and Trade Commission (SETC) in Stoyan Tenev and Zhang Chunlin (2002, p.30)

Figure 1.2 The pattern of privatisation of SMEs by region and methods



TT- total, R-restructuring, M-merger, L-leasing, C-contracting, JSC-joint-stock company, B-bankruptcy

Source: compiled by author based on the data provided by The State Economic and Trade Commission (SETC) in Stoyan Tenev and Zhang Chunlin (2002, p.30)

The theoretical rationale for transforming small & medium sized SOEs and collectives into co-operative shareholding enterprises was to clarify property rights and thus effect changes in companies' behaviour. In practice, the actual function of the transformation was to facilitate a quick sale of the enterprises to unload the burden of insolvent SOEs off government's back. The arbitrage resulting from the

transformed, 45.1% became employee-owned companies, 13.1% became employee-owned cooperatives, 14.3% were sold, 7% were contracted out to individuals, 8.5% were leased out, 7% filed for bankruptcy and 5% were absorbed by other firms.

⁴⁶ The Bankruptcy Law for SOEs was enacted in 1986 and became effective in 1988.

performance reforms in 1980s made a large number of S&M SOEs empty shells in the sense that their debt obligations exceeded their assets⁴⁷ (Wu, 1998, p.26). However, those enterprises with high debt ratios had often accumulated good quality physical assets such as land, buildings and equipment and the transformation of such enterprises was used to facilitate non-state buyers in taking over these desirable assets through various arrangement such as debt-for-equity conversions. The control rights of solvent enterprises resulted in ownership concentration in the hands of insider directors/managers. Once the ideological constraints lifted further, the enterprise frequently completed its transformation into a fully shareholding enterprise as the insiders took over the ownership of the enterprise. For those enterprises facing heavy debts, worthless assets and glutted markets, no buyers took them over, even for free.

In the process of transforming enterprises to co-operative shareholding the shareholder perspective on corporate governance was introduced. However, the lack of any appropriate formal or informal instruments made effective corporate governance impossible. In many cases, the establishment of partial corporate governance institutions was counterproductive. The institutions of corporate governance including the conference of shareholding employees, the board of directors and the board of supervisors were established. However, these institutions were unable to function independently as they remained subject to the power hierarchy of their equivalents in the extant administrative system. As the party secretary and managers transformed themselves into board directors and workers into the conference of shareholding employees, the arrangement maintained the *status quo* and subsequently intensified the power imbalance between management and workers.

As a result, workers' individual rights to do with hiring and firing, compensation, social benefits and working conditions were weakened. Meanwhile, worker's collective rights to consultation and information regarding production plans, use of public funds and other management matters were also put at a discount. The legal system's ability to protect employees' rights, even today, is still limited and employees have to request intervention by the appropriate government department to defend their interests according to the relevant regulations. Despite government

⁴⁷ In the mid-1990s, a government asset evaluation found that nearly 40% of the non-financial SOEs

regulations obligating managers to take employees' interests and voice into account when making decisions⁴⁸, employee interests still depend primarily on managers' morality and a weak command structure.

'Cronyism' between the bureaucracy and the re-emerging class of property owners reinforced the power imbalance within the enterprises. In that the old bureaucracy, remaining the core supervisory mechanism for the governing bodies, was engaged in transformation as well, the institutional constraints on insiders was actually *weakened* rather than strengthened. It was thus inevitable that corrupt forms of arbitrage and other forms of predatory behaviour grew in scale during the process of transformation. I argue that the efficiency perspective, if not irrelevant to the practical experience of both individual and public-owned enterprises' transformation to co-operative shareholding enterprises, was certainly hijacked by vested interests groups to justify covert *de facto* privatisation within an ideological framework which nominally favoured public ownership, leading to a massive transfer of industrial property from the collective to individuals.

With the flourishing development of non-state enterprises and the hidden privatisation associated with state sector reform, the new class of property owners became established as an interest group and the growing power of capital required market-oriented institutions to define and defend their interests. With the growing strength of the private sector, a draft constitutional amendment of March 1999, finally instituted in 2001, officially endorsed the private sector as an important part of the economy and fostered the growth of the private sector still further. This has made a significant contribution to overall rapid economic growth. But the process has embedded an unjust distribution of accumulated collective wealth into the Chinese political-economy and enlarged the divergence between the interests of the privileged few and the majority of workers. The problems associated with the process, to include the large scale redundancy of SOE workers, threatens social stability in the short term but

were overindebted.

⁴⁸ According to SETC regulations, managers are obliged to report to the employee conference on various business-related entertainment expenditures every six months. However, it has been mere a 'mouth service'.

in the long run risks jeopardising the reform process as a whole by risking the loss of political rationale and grassroots support⁴⁹.

1.6 Shareholding Restructuring and Modern Enterprise System – Another Chinese Characteristic of Ownership Reform

1.6.1 The failure of the transformation of large SOEs into publicly listed companies

Performance reform of 1980s did not bring about the efficiency of SOEs but instead resulted in a weak, stagnating state-owned sector within an otherwise booming economy. Since the middle of 1980 onwards, state enterprises adopted reform measures like decentralization, ‘corporatization’, inducing shareholder mechanism and restructuring through the stock market. However, these measures failed to save SOEs from losses. The ‘iron rice bowl’ was broken and layoffs deeply painful for workers. In 1985, 9.6 percent of all industrial SOE declared losses, amounting to RMB 2.7 billion. Ten years later, 44 percent of such firms were declaring loss, which had risen to RMB 40.9 billion. In 1996, China officially acknowledged that the state industrial sector as a whole had posted net losses for the year, the first time this had happened since 1949 (Lardy, 1999). Even many of nominally profitable SOEs, approximately 50 percent of industrial SOEs that declare profits, were beset by problems of insolvency.

However, through the reform throughout 1980s and early 1990, SOEs managers have been granted essential control of their enterprises. As indicated in Table 4, by 1993, SOEs had obtained substantial autonomy in the sense that the majority of managers exercised operational rights of decision making over production, pricing, sales and purchasing. Over 50% of SOE managers had rights of profit distribution and autonomy in the control of labour. The only two areas that remained primarily under state control were international trade and residual rights.

⁴⁹ We argue, one of the characteristics of China’s reform experience is that it has got the grassroots support, especially at early stage, in the sense that the majority has obtained substantial material

As I have indicated above, the malfunctioning governance of SOEs embedded in performance reform was incapable of defining ownership and failed to defend the property rights of SOEs from rampant arbitrage. What SOE reform really needed after the introduction of incentives was the enforcement of responsibilities and duties associated with them: the imbalance between incentives and associated responsibilities was a rudimentary problem.

Table 1.7: SOEs Autonomy

Decision Rights	1993	1994	1995
Production decision	88.7	94.0	97.3
Pricing decision	75.9	73.6	85.4
Sale decision	88.5	90.5	95.9
Purchase decision	90.9	95.0	97.8
<i>Export/import</i>	15.3	25.8	41.3
<i>Investment decision</i>	38.9	61.2	72.8
Use of profit retention	63.7	73.8	88.3
<i>Disposing asset</i>	29.4	46.6	68.2
<i>Joint and merging with others</i>	23.3	39.7	59.7
<i>Hiring and firing labour</i>	43.5	61.0	74.8
Personnel decision	53.7	73.3	74.8
Wage and bonuses	70.2	86.0	93.1
Internal organisation design	79.3	90.5	94.4
Refusal of probation	7.0	10.3	17.4

Source: *Almanac of China's Economy* 1996. China Entrepreneur Survey System's survey with total sample of 2752 managers, of which 72.9% are SOEs managers, 12.8% are collective enterprises managers. The SOE Law (1988) defines the domain of SOE autonomy in 14 rights listed in the table. Zhang Weiying (1998, p.20)

With the growing influence of neo-classical property rights arguments through the 1980s, it was accepted that previous incentive reforms were incapable of ensuring the requisite clarity and predictability of property rights and that something was needed to be done about it. By the end of the 1980s, the dominant view was that the development

benefits and the reform was comparatively just.

of a stock mechanism (*gufen zhi*) could be the answer and an effective prescription to save the SOEs. The Shanghai Securities Exchange (SHSE) and the Shenzhen Securities Exchange (SZSE) were officially established in 1990 and 1991 respectively and in a surge of reform in 1992, the government approved a 'bolder' plan to experiment with a shareholding system in SOEs.

The main objective of establishing the Chinese stock markets was to 'support the further rudimentary reform of larger sized SOEs by clarifying their ownership and property rights' (Sanders & Chen, 2003, p.118). Economists and decision-makers hoped to achieve a strengthening of the supervision over key agents, specifically the managers of the SOEs, by forcing the SOEs to establish a self-constraint mechanism through the stock market system. The official discourse was to establish a market-oriented 'modern enterprise system' and according to the decision of the Fourth Plenary Session of the 15th Central Committee of the Communist Party in 1994, the establishment of modern enterprise system would be achieved through two strategic phrases. In the first phrase from 1994 to 2000, the aim was to establish a preliminary modern enterprise system in the majority of large and medium sized SOEs. To improve and perfect the modern enterprise system was the objective in the second phrase from 2000 to 2010⁵⁰.

In the early stages, the stock market was essentially a 'policy-driven market' reflecting the ideological and political conflicts embedded in reform. The first breakthrough came after Deng Xiaoping's comments on the stock market during his southern tour in spring 1992. Deng pointed out: '(you are) allowed to take a see-saw policy, (you should be) determined to have trials; see-saw for one or two years, if (it turns out to be) right, open the stock market; if wrong, close it.'⁵¹

There followed a period of 'stock fantasy' (*gufeng*) after Deng's 'see-saw' speech leading to initial wealth blow-outs in the SZSE and SHSE. The huge potential for collecting money (*quan qian*) from flotation ignited a fever of enthusiasm towards the stock market. Shareholding reform of large sized SOEs ran rampant across China

⁵⁰ The project team on the research of hundred pilot enterprises that adopted modern enterprise system (the key project supported by the state natural science fund in the 9th Five Year Plan)

from the second half of 1991 and the number of newly transformed shareholding companies increased so quickly that the authorities could not keep proper account. According to Qian (1997, p.215-240), by the end of October 1993, approximately 3,800 'stock mechanism enterprises' in a variety of forms were registered across China ⁵².

The stock market evolved at a miraculous pace after 1992, although in the form of 'retreating by two feet but advancing by three' (*tui liangbu jing sanbu*) influenced by the changing policies of the authorities. By the end of 1996, the number of shareholding companies at or above the county level exceeded 8000, although the shares of most of these companies were non-transferrable⁵³. Market capitalisation at the end of 1997 reached 1753 billion *yuan*, up from 105 billion *yuan* at the end of 1992 (Ma, 2000).

The 15th Plenum in 1997 was a watershed in terms of changes in ownership and property rights⁵⁴. According to the decision passed at the Plenum, the stock mechanism became the principal mode for the establishment of the modern enterprise system in China and the stock market was designated as the correct channel for implementing further reform of the ailing SOEs through leasing, merging and capital reorganisation. The quota allocation associated with 'going public' on the stock market gave priority to 1,000 key SOEs, 120 large enterprise groups and 100 enterprises experimenting with the modern enterprise system.

However, instead of changing ways of thinking and exploring new forms of enterprise governance to deal with the increasing demands made on them to manage ever more complex and sophisticated publicly listed companies, policy making simplistically created publicly listed companies through the extant administrative hierarchy. And as a result, the problems associated with superficial and partial corporate governance in

⁵² From 1992 to the first half of 1993, more than 200 enterprises were reconstructed and held the title of 'stock mechanism enterprises' in Jiangsu province alone (Wang 1993). In Hubei province, there were only 23 stock companies in early 1992, yet within one year, the number had reached 133 (Zheng 1994).

⁵⁴ At that meeting, not only outright state ownership but also 'mixed public ownership' (in which the state held the majority of shares within companies with collective, individual and foreign shareholders) was defined as 'public'.

the co-operative shareholding transformation of small and medium SOEs arose in more extensive and complicated a scale in the transformed publicly listed companies.

The strategy of transplanting the corporate structure of public listed company through the extant political/administrative hierarchy was by and large a compromise process of distributing power and generating super-benefits in the stock market. It saved a lot of political cost at the beginning. But it led to a range of unanticipated problems that endangered the sustainable development of the stock exchanges and the very companies listed on them.

In the primary market, public offerings go through a complicated approval procedure in which the CSRC (Chinese Securities Regulatory Commission), the State Planning Committee (SPC), the State Economic System Reform Commission (SRC), and the Peoples Bank of China (PBC) jointly determine the annual stock issuance plan, stipulating the total number of new stocks to be listed on the exchanges and the total value of initial public offers. Each province is given a quota of new listings and the provincial Planning Commission and System Reform Commission *selects* the candidates. The selection at the provincial level is in principle based on industrial bureaux' recommendations and the overall balance between industrial sectors. The final approval for an enterprise's Initial Public Offering (IPO) is made by the CSRC, based on the recommendation of the provincial government, its assessment of the enterprise's financial and management conditions, current government policies, and stock market conditions (Ma, 2000).

Under the circumstances identified above, companies engaged in stock markets practices have been less concerned with economic performance than with survival in emerging, unstable and uncertain political and bureaucratic practices. The ties of cronyism between the bureaucrats and managers have become strengthened and have exacerbated a web of agency problems embedded in the development of security markets. Meanwhile, the market-oriented institutional instruments that were needed to constrain crony behaviour have either been absent or have been groping their ways to function from scratch. Their efficacy has been further weakened in that the patronage between state agencies and financial organisations and between the local government officials and the listed companies has made the supervision and

monitoring of the financial organisations and listed companies very difficult. Furthermore, the political consideration of maintaining social stability, however authentic, has been used as an excuse for not delisting any publicly listed company, no matter how poor the situation has become.

As a result, predatory behaviour has at various stages got out of control, given the fast pace of change and the lack of unambiguous law and rules to define the domain of 'shareholding transformation' clearly and to govern the very diversified local methods of transformation. After flotation, many listed companies have not been able to improve efficiency and have frequently operated by 'making profits in the first year (after flotation), breaking even in the second, and going into debt in the third.' The original aim of strengthening the supervision over key agents, specifically the managers of the SOEs, thereby forcing the SOEs to establish a self-constraining mechanism to improve efficiency in the stock market, not only failed but has weakened corporate governance in many SOEs.

In the light of rampant and growing arbitrage problems, government reacted by strengthening the institutional mechanisms of corporate governance. In 1999, the Decision of the Fourth Plenary Session of the 15th Central Committee of the Communist Party specified the necessity of implementing duties and liabilities associated with the establishment and perfection of the 'modern enterprise system': SOE managers had to be responsible for 'the appreciation' of the ultimate owner's net assets. In terms of state asset management, moreover, there was a need 'to establish and strengthen the institutional mechanisms and the enforcement of liabilities'. (my emphases)

1.7 Conclusion: privatisation past the point of return

In order to circumvent ideological difficulties, major China scholars argue that property-rights reform can substitute for outright privatisation (Liu Wei, 1999), and that governmental decentralization (especially through fiscal and financial reforms) can substitute for non-intervention in the economy (Wei jie, 1999). They argue that because of the lack of the legal, institutional and governance structures required to support an economic system based predominantly on private ownership, early and rapid privatisation of state-owned enterprises could not have been expected to improve economic efficiency. Although state-owned firms constitute a lagging sector of the economy, China's reform strategy has allowed non-state firms to flourish. As long as this strategy leads to a continuous decline in the relative contribution of state firms to total output, China ultimately will be transformed into a market-oriented economy capable of sustaining moderately high rates of long-term economic growth.

Chinese academics predicted that SOEs would eventually withdraw from most industrial sectors, while the state would retain control over a few key areas. The recommendation is that the state should pull out of direct activity in 146 of the 196 industrial departments⁵⁵. Currently, only 170 of China's 230,000 state-owned enterprises (SOEs) are directly under the control of the central government.

China's large sized SOEs have gone through a three-year programme of 'exchanging losses for profits' since 1998, according to government the 'vast majority' of them have completely achieve their goals by the end of 2001. Almost all large sized SOEs have gone through shareholding restructuring and have been transformed into PLCs listed in Shanghai, Shenzhen, Hong Kong and even New York stock exchanges, although a sizable part of SOE state owned shares (*guoyou gu*) - enough to hold the essential control of the enterprise - remain non-tradable⁵⁶. Although Chinese policy makers have never spoken the language of privatisation, they have substantially accepted the logic and put it into action. As the head of an leading official think-tank Chen Qingtai clearly indicated recently: "After the SOEs diversify their equity rights,

⁵⁵ A report in the official China Securities in November, 2000, citing research by the National Bureau of Statistics.

the government will control their equity through authorized state-owned holding companies. The original state-owned shares will thus be transformed into state-owned corporate shares, through which the separation between enterprises and the government in terms of property rights should be completed. These SOEs should establish a standard corporate structure in line with the Corporation Law and it should be *no different from private companies.*⁵⁷ (my italic)

Currently, the government's effort is to complete the shareholding reform of state owned PLCs with the aim of transforming the non-tradable state owned shares into normal trading share in capital markets. Given the controversy and complexity of the project, it was taken off the agenda planned for implementation in 2002 and was merely rescheduled for trial recently (November 2003).

In the medium and small sized sector, the reform throughout the 1990s can be summarised as mercy killing of medium & small SOEs. The main methods of ownership reform - mergers, bankruptcies, auctions, sales and the formation of joint-stock companies - encouraged employees, in most case cadres of SOEs, to become investors and shareholders. Bankruptcies, closures and restructuring were imposed resolutely on those state and collectively owned enterprises with long-term losses and negative debt-to-asset ratios. Private enterprises were encouraged to participate in reforming small-medium sized companies, including revitalizing state-owned assets by selling them to private entrepreneurs.

The government led gradual reform created a new socio-economic group of private entrepreneurs and 'cadre capitalists'. According to recent research⁵⁸, in terms of previous occupation, 63.1% of private entrepreneurs used to be government officials before they 'jumped into the sea of business'(*xiahai*)⁵⁹. After two decades of transition, the new socio-economic group has accumulated significant economic

⁵⁶ The legacy of non-tradable shares within Chinese SOEs will be addressed in chapter 8.

⁵⁷ Chen Qingtai, deputy director of the State Council's Development Research Centre, made the remarks while discussing China's current corporate restructuring on *Yangcheng Wanbao* (Yangcheng Evening News), Jan.24

⁵⁸ <http://news.sina.com.cn> 25 November, 2003

⁵⁹ It also raises a paradoxical fashion of the Chinese economic miracle: its economy took off but none of the firms did. Despite its growing private sector, China is still far from enjoying *bona fide* free enterprise.

strength, and has consequently been demanding legitimate recognition of what they have achieved and pursuing political presence in the further development of China.

The academic supporters of this new social-economic group argue that although SOEs still play a leading role in the Chinese economy, it is impossible for China to achieve sustained rapid economic development with sole reliance on the state-owned sector. According to them, the development of the private sector will be a driving force for the further growth of the Chinese economy⁶⁰. They argue that the redirection (reallocation) of resources itself can produce significant efficiency improvement. This argument requires that the party should abandon its ideological preference for state-owned enterprises, given the problems of inefficiency and bankruptcy.

The significant presence of this new social-economic group has been officially recognised. Now that the common development of economic sectors with different ownership has been established as a basic economic system, and a provision is to be written into the constitution protecting legal personal property from infringement. In the meantime, there is growing lobbying power proposing that various laws and regulations should be revised accordingly to relieve private entrepreneurs of their worries⁶¹. The Communist Party has reconciled its ideological claims with the growing importance of the private sector. Jiang Zemin's 'three represents theory' (*sange daibiao*), which has called upon the Party to 'represent the advanced forces of production; to represent advanced popular culture; and to represent the advanced view of the masses', is supposed to fill the ideological vacuum. As the logical result of 'three represents theory', the CCP now accepts capitalists (private entrepreneurs) into the party (Baum & Dreyer, 2000).

⁶⁰ To support their debate, they quote that the state owned part of the economy accounted for only a third of national industrial output in 1998, dropped from about three-quarters two decades ago. They also use the bank loan ration to support their judgement - the private sector received only 15% of total financing while the state sector got approximately 80% of state bank loans but only produce about 25% of total industrial output. And today the private sector accounts for about 50% of the economy. Private domestic and foreign employers provide a quarter of total urban employment, while the contribution from the state-owned sector has been shrinking (but still contribute to two-thirds of total urban employment).

⁶¹ State Council official: protection of private property key to promoting private enterprise
Dec 12 *Zhonghua Gongshang Shibao* (China Business Times)

However, alongside the birth and growth of non-state sectors out of the ashes of the state sector, it is a painful process with a growing sense of urgency about the social ramifications of massive layoffs. Although it was expected that the social benefits being generated by the process of 'creative economic destruction' would trickle down to the millions laid-off workers struggling to get by, reform has not been a win-win game for everybody involved. Apart from private property owners, the creative economic destruction has also created another new social-economic group of *proletarian workers born out of an egalitarian society*, presenting one of the most knotty challenges to China.

Chapter 2: Literature review: the question of property rights in the context of China in transition

Introduction

The debate around economies in transition, traditionally concerning the problems of the transitional process from a planned, socialist economy to a market-orientated capitalist one, has raised a number of myths. And no myth in economics has held such sway as the *property myth*.

One of the most popular claims made by those who accept *the property myth* is that any problems experienced by economies in transition can be explained by ambiguities in property rights entitlements. The absence of well-defined private property rights, or the existence of attenuations or restrictions on property rights, it is argued, inevitably gives rise to distortions, and privatisation is therefore prescribed, to a greater or lesser extent, as the ultimate solution to those problems and to the transitional process in general¹. As Stiglitz (1994, p.253) once argued: “This (property) myth is a dangerous one because it has misled many of the countries engaged in transition to focus on property rights issues, on privatisation, rather than a broader set of issues.... I have explained...resolving property rights is certainly not sufficient, and may not even be necessary.”

However, privatisation has been adopted as a legitimate (often a core) tool of statecraft by governments of more than 100 countries in the past two decades. The massive privatisation of SOEs has been the major part of a broader effort in the transition of former Soviet-bloc and central and eastern European countries. Given the spread of privatisation programmes around the world during the past two decades, it is necessary for this study to review the theoretical arguments and empirical evidence associated with the privatisation movement.

¹ On the other hand, when failure or loss is observed in settings of private ownership and control, e.g. the Enron collapse in 2001, it is not the institutional arrangement - private property - that is to blame but something else

The intellectual basis for the worldwide privatisation movement was Friedrich von Hayek's (1994) passionate critiques of the welfare state and collectivism, exemplified in his 1944 book *The Road to Serfdom*². The *property myth*, this thesis intends to argue, stems from an academic foundation within the property rights literature, most notably from a theoretical framework of what has become known as 'the Coase theorem', regarded by many property rights theorists as the backbone of their arguments. Despite the fact that Coase himself ended up dissociating himself from the perceived implications of 'his' theorem, supporters of the *property myth* both inside and outside China, as well as believers from other transitional countries, continue to give it obeisance, indeed, almost to cede it the status of truth.

This chapter will trace the formation of the *property myth* in the context of studies on the transitional economy. It will question the basic assumptions of conventional property rights theory in general and challenge their application to transitional economies and to China in particular. In part one, the research identifies various definition of the concept of property rights and ownership. This research adopts the definition of property rights as a set of economic and social relations and challenges the correctness of *efficiency per se* as the objective criterion against which to judge property rights.

In part two, this research discusses one of the major theoretical rationales of the *private property myth* – the Coase Theorem. The theoretical arguments for the advantage of private ownership of the means of production are based on such a fundamental theorem of welfare economics: under strong assumptions, a competitive equilibrium is *Pareto* optimal. The assumptions include requirements that there are no externalities in production or consumption, that the product is not a public good, that the market is not monopolistic in structure, and that information costs are low. In this thesis, it is argued that the Coase Theorem is theoretically tenable in its own right in the sense that it provides a theoretical benchmark for further investigation in the real world, but cannot be applied mechanically in a world with positive transaction costs, imperfect competitive market and incomplete information. However, regardless of the

² Yergin & Stanislaw (1998, p. 98-107) analyse how Hayek's work severed as intellectual basis for then Thatcher and the Tory politicians who began the intellectual campaign against state ownership in the U.K. that triggered the worldwide privatisation movement.

impractical nature of the Coase Theorem, this thesis identifies that it has been obeyed as the 'absolute truth' in many theoretical and empirical studies of the transitional economy of China.

In the third part of the chapter, this thesis firstly conducts a review of empirical literature on the worldwide privatisation movement in the past two decades and empirical evidence of transitional economies in particular. And then in the light of the Chinese experience, it analyses the power and influence of privatisation as ideological prejudice, examines the danger associated with this when applied to the further transition of the Chinese economy and presents a number of serious dilemmas for future policy makers as a result.

2.1 Concepts of property rights and ownership

The discussion on ownership, property and property rights has a long history that can be traced back to Adam Smith. However, economists have not reached a common understanding of these concepts. They tend to talk of property, of ownership, and of ownership of property as if these terms were widely understood, when in fact both their connotation and extension can be diverse and contradictory.

Classical economists conventionally acknowledged there were two critical attributes of property rights. Firstly, they accepted that ownership involved, above all, possession; in societies to possess a property was to own it, therefore, property rights and ownership were essentially equal. Secondly, the ownership of property was widely regarded as a 'natural right' and to be allowed to pursue exclusive property was a natural endowment. The implication of this was that it was (private) property rights guaranteed by law, which underpinned social institutions and provided the basis for civil society. As a result of the above, (private) property rights guaranteed by law became implicit assumptions within classical micro-economic and welfare economic theory.

To the extent that property rights were *taken for granted* within such theory, they were rarely the object of discussion and debate and remained untheorised for some time. The writings from some 'institutional' economists dating from the 1920s, in particular Frank Knight's *Risk, Uncertainty and Profit* (1922), J.R.Commons's *Institutional Economics* (1934) and R.H.Coase's *The Nature of Firm* (1937), brought the question of property rights to the central domain of economic studies. But while significant amounts of academic attention have shifted towards property rights, particularly since the 1960s, the economic dimension has remained unintegrated within that domain.

2.1.1. Property rights as a material thing

The interpretation of property rights as synonymous with ownership comes from the Oxford Law Dictionary in which "Property right (is defined as) the ownership of

property, any object or right that can be owned. It includes the right to possess, the right to use, the right to lease, the right to transfer, the right to dispose and other rights related to the property.”

Some scholars accepting such a definition interpret ownership as ‘a bundle of rights’ (Demsetz 1988, p.12) representing human relations over properties. This interpretation is consistent with the definition of property rights in Roman Law and Common Law, where ownership is interpreted as the unity of the four aspects of rights: the right to use, the right to income, the right to dispose and the right of transmissibility.

In the same vein, some economists argue that property rights and ownership cannot be used indiscriminately and that the domain of property rights is far broader than that of ownership. For example, Y.Barzel (1989) proposes the domain of property rights as containing ownership (the right to possess), namely, the exclusive right of control over the property; the right to use; the right to manage; the means to decide how to use the right of control; the right to income and debts; the right to capital; the right to transfer; the right to security; the prohibition of harmful use and its liability to the executive. The essence of this notion is to regard property rights as the rules defining relationships between the entitled person and the related material things.

2.1.2 Property rights as a set of social and economic relations

In contrast, as L. Fisher (1923) puts it “a kind of property right is not a material thing but an abstract social relation.” Furubotn and Pejovich (1972, p.1138) elaborate that: “a central point ... is that property rights do not refer to relations between men and things but, rather, to the sanctioned behavioral relations among men that arise from the existence of things and pertain to their use...The prevailing system of property rights in the community can be described, then, as *the set of economic and social relations* defining the position of each individual with respect to the utilization of scarce resources.”

Hallowell (1943) regarded *property* as a triadic social relation involving benefit streams, right holders, and duty bearers. He proposed the concept of *property regimes* and pointed out *instrumental* origins of property regimes. Property regimes acquire their special character by virtue of collective perceptions regarding what is scarce (and hence *possibly* worth protecting with rights), and what is valuable (and hence *certainly* worth protecting with rights). According to this notion, particular property regimes are chosen for particular purposes.

Williams (1977) elaborates the *instrumental* notion of property rights by differentiating *empirical possession* with *de jure* or intelligible possession³. He argues that empirical possession cannot establish ownership⁴ and a social convention – a social contract – is logically prior to real ownership. Bromley (1991, p.5) concludes on this notion: “First, and foremost, *all property rights flow from the collective* as opposed to flowing from some alleged ‘natural rights’ that are claimed to be logically prior to the state. Second, *property rights are instrumental variables*, that is...if the collective fails to admit the social usefulness of a particular property claim, then it is delegitimised because it is regarded as non-instrumental”.

Logically deducible from the above notion, to regard property rights as policy instruments is, as Bromley (1991, p.12) puts it, “to invoke a search for the efficient structure of property rights on the presumption that the efficient structure is an *unassailable desideratum*⁵”. According to this school, the claim of *efficiency* as the ‘objective truth’ for the evaluation of economic policy has been critically examined and challenged. Therefore, there is a need to search for other *criteria* to judge institutional arrangements such as property rights. Although the correctness of *efficiency* as the objective criterion against which to judge property rights has been challenged, it remains the conventional wisdom in studies on property rights. This thesis will critically examine this conventional wisdom.

³ Kant first proposed the concept of ‘empirical possession’ and ‘*de jure*’ possession of a property.

⁴ That is, while physical appropriation is *necessary* for something to become someone’s property, it is not *sufficient* to constitute property.

⁵ Desideratum: the efficiency neither objective (value free) nor necessarily the ‘correct’ decision-rule for public policy.

Among diversified views on property rights within the *efficiency* school, the most widely accepted version is the Washington school's⁶ notion on property rights based upon Coase's works on externalities and social costs, even though these works rest on the abstract model of a simple two-party affair, which is often highly misleading when applied to the real world.

Demsetz's instrumental perspective on property rights represents the widely accepted concepts of property in economics. It has tended to identify three general types of property: (1) private property; (2) state property; and (3) common (or communal) property. Demsetz argues that: "Communal ownership means that the community denies to the state or to individual citizens the right to interfere with any person's exercise of communally owned rights. Private ownership implies that the community recognizes the right of the owner to exclude others from exercising the owner's private right. State ownership implies that the state may exclude anyone from the use of a right as long as the state follows accepted political procedures for determining who may not use state-owned property (1967, p.102-6)". This three-part conception of property has been instrumental in the creation of what might be called the conventional wisdom of property rights.

⁶ Alchian, A., Demsetz, H., and Cheung, N.C.S (1973,1981,1982)

2.2 Conventional property rights theory

Property rights theory, according to conventional mainstream arguments, crucially concerns two intertwined questions. At the individual, or firm level, how can economic actors be motivated to “expend effort, plan, invest, and bear risks” (Walder & Oi, 1999) for the optimal use of scarce societal resources? At the system level, how can resources be put into the hands of those who will use them best? (Edwards, 1998). At the latter level, according to the traditional dichotomy, resources can be allocated by two means, via the market or via the plan.

One of the purposes of this study is to understand the basic theoretical underpinnings of conventional property rights theory, to examine what the received wisdom of the private property rights perspective offers and to what extent it is applicable in the transitional context. As the privatisation perspectives are derived from the *Coase Theorem* and *Demsetz's instrumental perspectives of property right*, this review begins with the *Coase Theorem*.

2.2.1 The Coase Theorem

A crucial feature of Coase's important most famous work is that its focus is not on property rights itself. His topics are externalities, transaction costs and social costs. In *The nature of the Firm* (1937), in order to explain why firms exist and what activities they undertake, Coase introduces the concept “the cost of using the price mechanism”, “the cost of carrying out a transaction by means of an exchange on the open market,” and simply “marketing cost”. To express the same idea in his article on *The Problem of Social Cost*, he uses the phrase “the costs of market transactions.” (1988, p.6) These have come to be known in the economics literature as “transaction costs”⁷.

⁷ According to Coase, “in order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on.” (1937, p.114.)

And, according to Coase again, the most important adaptation to the existence of transaction costs is the emergence of the firm (1988, p.7). Coase points out that markets are institutions that exist to facilitate exchange and exist in order to reduce the cost of carrying out exchange transactions and goes on to argue that for anything approaching perfect competition to exist, *an intricate system of rules and regulations* would normally be needed. Coase comments: "Economists observing the regulations of the exchange often assume that they represent an attempt to exercise monopoly power and aim to restrain competition. They ignore or, at any rate, fail to emphasise an alternative explanation for these regulations: that they exist in order to reduce transaction costs and therefore to increase the volume of trade."

The *Coase Theorem* is not, in fact, Coase's theorem at all, to the extent that it was George Stigler who was responsible for coining the term. Coase never wrote down any authoritative formulation. Indeed, as Coase has said of the 'Coase Theorem':

"My conclusion was: '...the ultimate result (which maximizes the value of production) is assumed to work without cost.'" This conclusion was formalized by Stigler as the 'Coase Theorem', which he expressed as follows: '...under perfect competition private and social costs will be equal.'" (1988, p.14)

Coase's students and other later economists' theories who brought into play the questions of wealth effects, endowment effects and informational asymmetries account for the Coase Theorem's tortuous doctrinal history. Among many versions of 'Coase Theorem', the most common formulation is that when transactions costs are zero, resources are used efficiently (i.e. *Pareto efficiency* will be achieved), regardless of the initial assignment of legal entitlements. Yet this version of the 'Coase Theorem' is logically in conflict with Coase's original argument which holds that since we observe firms and externalities, there is *prima facie* evidence for the existence of transactions costs. In a world of no transaction costs – the world of neoclassical price theory – the firm (*qua* hierarchical organisation) has no economic purpose and neither, by the same logic, does liability law.

Critique of the 'Coase Theorem'

The ideas behind the *Coase Theorem* join transactions costs to two related themes in the Coasean *oeuvre*⁸ – the efficacy of government interventions and of economists' methods, respectively. First, while economists in the Pigovian tradition regard policy makers as sufficiently well informed and well-intended to remedy market failure, Coase suggests that government cures can be worse than market diseases. Second, while neo-classical economists practice 'textbook economics', blinding them to transaction costs and to the difficulties of successful government intervention, however, Coase insists on an economics which is empirically grounded and alert to differences among alternative institutional arrangements.

Thus, Coase can be perceived as a policy *pragmatist* who believes that the appropriate institutional choice – market versus government – can be determined only by comparative, case-by-case, cost-benefit analysis (Samuels & Medema, 1997). First, while markets may fail in the presence of high transaction costs, it doesn't follow that government remedies *necessarily* do any better. The anti-interventionist spirit of Coase suggests that markets will bargain away externalities and other market failure and that successful intervention requires more information than even well intended governments are likely to have. But, second, Coase objects not to intervention *per se*, but to intervention rationalized solely by 'textbook' considerations. "Coase's empirical approach derives its force not because it somehow rejects the idea of market failure, but because it so pointedly shows that purely 'blackboard' exercises can lead to egregious empirical lapses. His method is Marshallian, part of the British tradition, with its emphasis on understanding, induction, empiricism, and prudence with respect to mathematics" (Richard Zerbe, Jr. & Medema, 1997).

How could the author of 'The Nature of the Firm' be mistaken for a proponent of zero transactions costs? Indeed, Coase insists, since we live in a world of pervasive and high transaction costs, there *is* a rationale for policy.

⁸ Samuels & Medema (1997) introduced this phrase.

2.2.2 Critique of the application of the ‘Coase Theorem’

Coase once said querulously “my argument has not been understood” (1988, p.7), in an attempt to reclaim himself from the famously misnamed ‘Coase’ Theorem. Coase’s approach to transaction costs – the costs of using the market mechanism – has had wide appeal and one of the applications is Demsetz’s instrumental perspective of property rights. Demsetz’s work is best known for his definition of the ‘bundle of rights’, the ‘three-part concept of property’ and his conclusion as to the full advantage of private property rights.

Demsetz builds up his ‘framework of ownership’ (Demsetz 1967, p.12) on the basis of Coase’s work. The approach he takes in his framework involves the need to “accept a bundle of ownership rights as given fact and to examine the consequences that flow from hypothetically altering certain characteristics of the legal framework that defined ownership, the consequences of ‘altering the identity of owners of entitlements and of altering the content of the ‘bundle of rights’.” (1967, p.13)

Demsetz proposes one of the key issues raised from ownership as an exogenous phenomenon was the identity-of-owner problem derived from Coase’s work on social cost (Coase, 1968). Demsetz argues the central point in Coase’s analysis was that implicit cost motivates behaviour which ameliorates potential externality problems. Thus, once the initial assignments of entitlements are clarified, the externality problems will be eliminated through ‘free’ trade. The other issue, as Demsetz proposes, raised from ownership as an endogenous phenomenon is to examine the sources of change in the bundle of rights that define ownership⁹. Demsetz (1967, p.16) proposes one useful way to consider two important components of the bundle of rights: exclusivity and alienability¹⁰. Following the above approach, Demsetz concludes “the comparative advantages of one set of ownership rights over another

⁹ For example the consequences that flow from the *ad hoc* legal action affecting the condition of ownership (Coase 1968), and how this change is predictably related to changes in underlying circumstances. The content of the bundle of rights may be categorised in many different ways

¹⁰ Exclusivity refers to the right to determine who may use a scarce resource in a particular way. The notion of exclusivity derives from the right to insist that no one other than the ‘owner’ use the resource, but this notion is extended to include the right of the power to determine who else may use a resource. Alienability refers to the right to reassign ownership to someone else. It includes the right to offer for sale at any price.

(communal v. private) turns on a comparison of the consequences of relying on ‘full’ private ownership, which permits exclusivity and alienability by private decision, or on exclusivity obtained through actual use and alienability obtained through political processes” (Demsetz, 1988).

Although Demsetz’s work is only one stream of various schools of thought, measured by citation, his research on property rights and ownership has been extremely influential in the study of the transitional economy. Based on the researches of Ronald Coase, Demsetz and his Washington School fellows A.A. Alchian and Steven Cheung (1972, 1982, 1983) have developed a transactions costs theory of institutional change. They have focused on one important element of institutions, namely the structure of property rights as setting the constraints or rules for people to compete and exchange. Hence, for them, the essential element of institutional change is a change in the structure of property rights.

The ‘circularity problem’

The critique of the Coase Theorem and the instrumental perspective of property rights in the context of institutional change, both at the methodological level and empirical stage, have been made from different schools of thought.

In Demsetz’s analysis, with *exclusivity* and *alienability* as key components, he discusses the question of property rights change in an *abstract* ideal world in which transaction costs are *zero*. However, he proposes the advantage of ‘full’ private ownership as a practical rule in a *real* world, in which transaction costs are *positive* all the time. The disguised replacement of assumptions in his discussion reflects the logical conflict in the setting of his framework.

As already implied, Coase is, to some extent, himself among the strongest critics of the ‘Coase Theorem’. Meanwhile, R.D. Cooter’s argument is that externalities are reciprocally caused, thus it is impossible to eliminate the externalities under conditions of non-perfect competition in the exchange of legal entitlements. Cooter

(1972) also falsifies the basic argument of the Coase Theorem that well-defined property rights will minimize transaction costs by studying the behaviour of two oligarchs in a monopoly market. Under such circumstances, according to Cooter, although the entitlements of property rights are clear, the trade process between two oligarchs approximates that of a 'game' and leads towards increased market uncertainty instead of minimizing social costs. Robert Ellickson (1994) also argues that the injunction 'minimize social costs' cannot help a society decide how to confer fundamental entitlements, because the costs and benefits upon which the analysis depends come into existence only after those entitlements have already been conferred. Thus, there is a tension between Coase's debate over the choosing of social arrangements so as to minimize social costs and his comparative institutional approach, the former requires that the latter already exists. Samuels and Medema (1998) refer to this 'catch' as the '*circularity problem*'.

The direct falsification of the doctrine theorem is generated from the introduction of the existence of information asymmetry into the debate. According to Usher (1998: &), in the presence of private information, in a world of zero transaction costs, efficiency may not only be achieved for any initial allocation of clearly defined property rights, but also without an assignment of property rights *at all*, i.e., "when property rights are insecure and it is not known in advance which party will prevail". Adopting Coase's original case between farmer and rancher, Schmitz (2001) uses econometrics to neatly analyse various transaction outcomes, given the proposition of a simple bilateral trading problem with discrete costs and valuations: if property rights are clearly assigned, it would lead to inefficiencies; if not, there would be full efficiencies for all parameter constellation¹¹.

¹¹ The model: A: Farmer / B: Rancher

$$U^A = t - xc$$

$$U^B = xv - t$$

Where t : transfer payment, x is a logic value, $x \in \{0, 1\}$;
Where c : A's cost, $c > 0$; v : B's benefit(valuation), $v > 0$

C : C_L , or, $C_H > C_L$ (Only A knows the real value of c)
 V : V_L , V_H (Only B knows the real value of v)

Let: $X_0 \in [0, 1]$

$X_0 = 1$: No agreement reached

$X_0 = 0$: A has the property right, decision can be made

Under such circumstance, according to Schmitz (2001, p.24), not assigning initial property rights may not only be as good as any clearly defined allocation of property rights, it may even be strictly better.

Apart from the above debates, significant empirical studies provide evidence that the 'Coase Theorem' is rather a 'Coase Conjecture'. Empirical evidence has falsified the argument of the full advantage of private property rights generated from Demsetz's property rights framework. According to another school of scholars, the evidence of the falsification of the 'Coase Theorem' has been raised in three aspects. First, the clear assignment of property rights does not necessarily lead to efficiency¹². Second, there is a large and growing literature showing that the absence of well-defined private property rights need not give rise to problems¹³. Third, more generally, there is the question as to whether the absence of well-defined property rights is the key problem of inefficiency¹⁴.

Yet, although the theoretical bases of the 'Coase Theorem' and Demsetz's instrumental perspective of property rights have been challenged and falsified, they

The model of Information Asymmetry in this case

1. Assumption: ($x_0 = 1/2$)
2. $[t(v, c), x^*(v, c)]$

The Bayesian incentive compatibility constraints:

$$E_v[t(v, c) - x^*(v, c) | c] \geq E_v[t(v, \hat{c}) - x^*(v, \hat{c}) | c] \quad \hat{c} \in \{C_L, C_H\}$$

$$E_c[x^*(v, c) | v - t(v, c)] \geq E_c[x^*(\hat{v}, c) | v - t(\hat{v}, c)] \quad \hat{v} \in \{V_L, V_H\}$$

The interim individual rationality constraints:

$$E_v[t(v, c) - x^*(v, c) | c] \geq -x_0 c \quad c \in \{C_L, C_H\}$$

$$E_c[x^*(v, c) | v - t(v, c)] \geq x_0 v \quad v \in \{V_L, V_H\}$$

Clearly defined property rights: $X_0 = 1$, or, $X_0 = 0$

If farmer has the property right, efficiency cannot be achieved if

$$V_H > C_H > V_L > C_L$$

$$\text{AND} \quad \frac{1}{2}(V_H - C_L) < C_H - V_L$$

Source : Schmitz 2001: 24

¹² Public good problems, for instance, are not resolved by Coase's theorem. Farrell (1987) argues that in the presence of imperfect information, giving rise to what may be viewed as transaction costs, inefficient outcomes frequently arise; indeed mutually beneficial deals simply may not occur, as one party tries to convince the other that the value of the relationship to him is small, in an attempt to appropriate a larger fraction of the surplus that accrues from the relationship.

¹³ Cases studies, such as Bromley's research (1994) on land management, show local communities have avoided the Tragedy of the Commons by a variety of regulatory devices.

¹⁴ One piece of evidence in support of this is that most large firms, both in western developed economies and in transitional economies are not run by owners but by hired managers.

have maintained hegemony in research on transitional economies and influenced policy making in transitional countries.

2.2.3 Applications of the Coase Theorem in research on the transitional economy of China

2.2.3.1 The Coase doctrine in relation to the research on transitional economies generally

A: Mainstream arguments

Most persuasive researches evaluate China's emerging market for enterprise ownership rights from the perspective of conditions underpinning the *Coase Theorem*: the assignment of property rights, the degree of competition, and the nature of transaction costs. According to these researchers, Chinese SOEs are described as '*a form of impure public good*.' They argue that ambiguous ownership and ineffective monitoring lead to opportunistic behaviour by 'workers, managers, and public officials, who extract value from the firm in excess of what they put in.' The firm's 'inability to...limit the over-consumption' by various stakeholders 'transforms the state enterprise into a commons' (Jefferson, 1998, p. 428) and the over-consumption associated with state enterprises and with public goods generate negative externalities, which exactly parallel the examples popularised by Coase's 1960 study of social cost¹⁵. Aligned with these arguments, there is no consensus on 'how the agencies of state ownership can be established' (Wu Jinglian 1995, p.89).

The Coase Theorem serves as the most important intellectual basis of the arguments of this school. It is widely argued by it that *for Coase*, the key is to encourage

¹⁵ Furthermore, since the banking system, which supports China's enterprise system, is unable to monitor its resources effectively, China's SOE's exhibit non-excludability and non-rivalry, the key characteristics of public goods. They argue that. In term of reducing transaction costs, they argue that the challenge of reform is to develop decentralized mechanisms to replace official decision-making. They suggest the establishment of "accounting and auditing standards, codification of fiscal regulations, markets for managerial talent, commercialised bank lending, enforcement of debt obligations, commercial laws, economic courts, securities markets, credit ratings and arbitration mechanisms"(Jefferson 2000,p.16).

decentralized agreements that rearrange and restructure ownership and control of productive assets (Jefferson, 1998). The analysis now known as the Coase Theorem shows how the delineation and protection of property rights permit interested parties to negotiate efficient solutions to market failures without the participation of the state. Thus, they conclude with the propositions that the reform faces a choice between restructuring ownership rights on the basis of market forces or administration decisions, and that market forces bring positive flows while administrative decisions lead to failure.

This school has examined three areas, the transparency of enterprise structures and operations, the adequacy of transaction resources and the adequacy of bankruptcy procedures, and concludes that Coase's analysis is applicable in that the incremental clarification of ownership, increased competitiveness of markets for property rights and partial reduction in transaction costs have stimulated decentralized enterprise restructuring that has encouraged higher productivity, lower costs, and accelerated growth.

This school criticizes the soft-budget constraints of state enterprises and identifies the impure public good (externality) problem as the lack of a fundamental change in ownership and in corporate governance¹⁶. They suggest "China must recapitalise and restructure its domestic banking system and impose hard budget constraints on firms...to ensure that managers act on behalf of the owners of the firm. Given the evidence from the first two decades of reform, the latter almost certainly will have to include widespread privatisation of state-owned firms." (Tawski, 1999, p.52-58)

In addition to the Coase Theorem, Demsetz's approach on property rights has often been adopted to explain the state sector's problems. One of the widely accepted uses of Demsetz's work on the content of property rights (*exclusivity and alienability*) has

¹⁶The classic analysis on the question of soft budget in SOEs constrain can be find in Kornai (1988, 1993, 2000). However, it is difficult to distinguish between the distributional and efficiency effects of soft budget constraints. High wages, for example, show up in firm deficits, but do not necessarily imply (technological) inefficiency. The threat of bankruptcy and hard budget constraints are major difference between public and private ownership. "But the difference should not be exaggerated", as Vickers & Yarrow (1991: 111-132) point out, hard budget constraints have been successfully applied to SOEs, at least at times. Regulators of privatised utility companies in Britain are effectively required to ensure that they do not go bankrupt. And government has many ways to loosen the budget constraints for private firms, including subsidies, loan guarantees, trade protection, and ultimately nationalisation."

been to analyse ownership (property rights) into separated components¹⁷. There are various applications of this framework¹⁸. Although they emphasise the different aspects of the 'property rights', in essence, scholars from this school unanimously suggest that "privatisation of state assets – that is, the creation of clear and legally enforceable property rights of firms versus the state – is the only way to remedy the problems associated with soft budgets and bargaining over financial terms." (Walder 1993, p.53)

B: Critique of mainstream arguments -transaction costs: the costs of using the market mechanism

It is a little farfetched to bracket the problem of 'the over-consumption associated with state enterprises and with public goods generating negative externalities' with the examples popularised by Coase's 1960 study of social cost. There is an obvious misinterpretation of the nature of 'externalities'. The world without externalities turns out to be as strange as the physical world would be without friction. Externality is an omnipresent phenomenon in the real world that is not merely associated with SOEs and public goods. In the opinion of this thesis, over-consumption (X-inefficiency) associated with whatever kind of enterprise, whether public or private, generates externalities under monopolistic market structures¹⁹. Empirical evidence (e.g. Vickers & Yarrow, 1991) from the privatisation experience of developed countries suggests that private ownership is likely to have an advantage in competitive market conditions

¹⁷ One of the widely accepted formulations is stated as follows (Andrew Walder 1994):

- 1). The right to use an asset: the right of control.
- 2). The right to appropriate the returns from an asset: the right of distribution.
- 3). The right to change the form or substance of an asset by transferring rights to others and to bear the consequences from changes in value.

¹⁸ Walder regards Chinese reform as the reassignment of use rights, the reassignment of rights to returns from assets (fiscal reform), and the reassignment of rights to transfer assets. Chinese reforms have involved extensive reassignment and clarification of property rights among government agencies and publicly owned firms, however, according to Walder, have involved only a very limited role for privatisation. Grossman and Hart (1986) analyse the separated parts on the same base but they emphasise the rights to residual control, referred to individuals' right to extract personal rewards. Eirik Furubotn, Svetozar Pejovich adopted the similar approach and discussed within this paradigm, more recent works analyse the contents of property rights into three components as, the user rights, the extractor rights and seller rights (Xiaobo Hu, 1998, Jean Oi, 1999).

¹⁹ In terms of ownership, most publicly-listed companies in the western developed economies are clearly owned by shareholders, and these kinds of companies have been puzzled by problems raised by the separation of ownership (in the hands of shareholders) and control (in the hands of operators, managers) for nearly a century and nobody blamed the 'private' ownership and suggested to solve these problems by clarifying property rights only.

(and in the absence of other market failures), where externalities effects are small, so private profit and social welfare objectives are more closely aligned. On the other hand, public ownership may have the advantage if externalities are larger and the pursuit of personal agenda needs to be constrained, for example by a well-functioning political system.

According to Coase, '*social (transaction) costs*' are generated from the use of the market mechanism, and it is impossible to eliminate the externalities under conditions of non-perfect competition in the exchange of *legal entitlements* only²⁰. The assumption of the *Coase Theorem* - the absence of transaction costs and the condition of perfect competition - does not exist in the real world. Coase's *The Problem of Social Costs* was not meant to show that we live in the best of all possible worlds, indeed on the contrary, it was meant to show that we don't, and that as a consequence, there is a rationale for *policy*.

In developed economies, government intervention has historically been far from an unusual phenomenon. The volumes of law and regulation needed to facilitate economic exchanges in the developed market economies suggest a rationale for the participation of the state in the delineation and protection of property rights. The real question is to understand the institutional variation between the transitional and developed capitalist systems. Only when the variation is identified, it becomes possible to see which institutions in transitional systems are missing and to identify the real problem of reform. Therefore, this thesis argues, the prescription that the reform of China faces a choice between restructuring on the basis of market forces or administration decisions is mechanic and dangerous to apply to the real world²¹. Regarding the relationship between market forces and government intervention, Coase's British adherents Vickers and Yarrow (1991, p.111-132) neatly conclude:

²⁰ The most important contribution of Coase's work is his insistence that the firm as an intricate system exists to reduce transaction costs. Through the complexity of the firm's operation, it incurs certain transaction costs which constitute a fundamental challenge to modern production across a range of economic systems – including transitional and developed capitalist ones.

²¹ The case study of this research in chapter 8 shows that in a transitional country like China, the reform started with the reintroduction of market forces involves the creation of market institutions (law, social norms etc.) from scratch. Law by nature is incomplete. In the context of transitional China, the incompleteness of law presented in a much greater scale, thus merely leave the restructuring to the market force without constraints of enforceable law would give rise to 'institutional vacuum'.

“Any form of ownership is inevitably imperfect. Market failures can lead to divergence between profit and welfare objectives in private firms. Government failure lead to divergence between political / bureaucratic and welfare objectives in SOEs. Monitoring failure leads to divergence between the objectives of enterprise managers and their principals, whether the principals are private owners or political superiors. The effects of ownership changes on welfare will depend upon the relative magnitudes of these imperfections. As a first approximation, privatisation can be viewed as a means of reducing the impact of government failure, albeit at the risk of increasing market failures, and of changing monitoring arrangements. ... In the end, what matters is how the combination of ownership and regulation under private ownership compares with ownership and (implicit and explicit) regulation in the public sector.”

Despite theoretical and logical questions, the ‘privatisation perspective’ has been established as a *paradigm* which has become the conceptual guide for studies in this field. Without a challenge to this perspective, a tendency has developed in which the *hypothesis* that the clarification of property rights through market forces improves enterprise performance becomes accepted as *fact*, and the search for empirical evidence of the hypothesis itself simply drops out of the picture.

C: The ‘circularity dilemma’

Mainstream economists argue the need to establish market-oriented institutions²² to facilitate the reform of ownership. By suggesting so, they inevitably face the ‘circularity problem’, the question of whether these institutional arrangements are the prerequisites or the outcome of the reforms of ownership. In the absence of market-oriented institutions in a transitional economy, the reform of ownership cannot be facilitated in the ‘institutional vacuum’. On the contrary, at least to some extent, it depends upon the extant institutional structure.

²² Including accounting and auditing standards, codification of fiscal regulations, markets for managerial talent, commercialised bank lending, enforcement of debt obligations, commercial laws, economic courts, securities markets, credit ratings and arbitration mechanisms

This thesis critically argues that, the costs and benefits of the change of ownership and reassignment of property rights resulting from adopting new market-oriented institutions come into existence only after those institutions have already been conferred. The change of ownership and the development of market-oriented institutions are intertwined elements in a transitional economy and the change is a path-dependent 'creative' process. In other words, the result of the change cannot be 'predicted', or alternatively stated, 'discovered'; on the contrary, the results gradually unfold through a 'creative' process.

2.2.3.2 The application of Coase Theorem in research to China's state sector reform

In the past 20 years, China's state sector reform started from 'releasing rights' and the change of ownership and property rights has been facilitated through strong government-led institutional innovations. However, as indicated in chapter 1, the interesting thing emerging from the state sector reforms is that the *unanticipated* outcomes of reforms have brought about *unanticipated* new problems. Predatory behaviour upon both state financial intermediaries and state firms in the 1990s made the most pragmatic market-oriented property rights reforms essentially meaningless.

The argument of this thesis is that the conventional property rights theory cannot provide an explanation to the problems that have puzzled Chinese SOEs firms over the reform period. The reform policies, those implemented in 1990s in particular, associated with the state sector based upon the conventional property rights theory has led to a paradox which results from the constant release and distribution of rights without the true enforcement of relevant rights and duties. Indeed, some Chinese scholars argue that China's radical ownership reform of the state sector in 1990s has contributed to social injustice and economic inefficiency and in the long term may jeopardise the sustainable development of the Chinese economy (He Qinlian, 1998).

This thesis argues that the main differences between a state-owned enterprise in a transitional economy and a western publicly listed firm are in the regulations and mechanisms that govern accountability. In western market economies, it is the set of

market-oriented institutions that has evolved for centuries within a 'civil society operating under the principle of rule of law' (Coase: 1959) that facilitates exchange and makes property rights function. The challenge of transitional reform, therefore, is not to transfer property rights *per se* but rather to *create* them and create as well the whole institutional matrix necessary to make them function (Frydman & Rapaczynski: 1994, p.51). It is clear that the basic precondition of the 'Coase Conjecture' – the true enforcement of rights and duties by law - simply does not exist in the transitional context, and that, as a result, there is a question mark over the *relevance* of the 'Coase Theorem' to a transitional economy facing the challenge of a much greater incompleteness of law.

According to many Chinese scholars and decision-makers, the major objective of Chinese reform is to establish a market-oriented system yet there has been no benchmark for such enormous institutional change to compare it against. The simplistic adoption of conventional property rights theory, which is arguably irrelevant to the Chinese context, entails the conflict between the assumptions of textbook theories and Chinese empirical practice²³. While in a modern publicly listed enterprise, where the ownership and control of the firm are separated, it is impossible to determine who in essence 'owns' a public enterprise and thus the notion of clarification of property rights as a precondition for efficiency does not make much sense and the theory becomes highly problematic.

As illustrated in chapter 1, since the implementation of 'the 14 Articles' in 1992 as part of the reform in the name of clarifying property rights, SOE managers have been granted rights of control to an extent their western counterparts would not have dreamt of. However, the problem resulting from releasing rights is that responsibility is blurred, restraints and supervision on firm managers is weakened and, eventually, the state property regime is replaced by a property regime approximating *open access*.

Economists and decision-makers have always been very positive in their abilities of 'prediction' and appropriate policy formation and have underestimated the lack of

²³ The conventional property rights theory analyses the behaviour of rational, individualised actors (Coase's theorem derives from an analysis of the potential exchanges between a farmer and a rancher)

knowledge and information in achieving them. They frequently ignore ‘uncertainty’ in the economy and give insufficient attention to the impossibility of anticipating every contingency. Compared with ownership reforms of the state sectors in many western economies, Chinese reforms have been intensive and radical, involving not only significant transaction costs but also large distributional problems. The dilemma is that it is impossible to forecast the possible outcomes of changes in the ‘rules of the game’ and anticipate contingency before the policies are implemented. If there is any wisdom we can glean from the ‘Coase Theorem’, it is an understanding of uncertainty and the ‘catch’ of the ‘circularity dilemma’ rather than anything else.

2.2.3.3 The application of conventional theories on research of Township and Village Enterprises (TVEs)

“The existence of well-defined private property rights seems an absolutely essential precondition to the proper functioning of a capitalist market economy. Such a basic truth comes at us from theory and from practice.”(Jean Oi & Walder, 1999) However, this basic truth has been challenged by the experience of non-state sectors, mainly the TVEs, in the context of Chinese reforms.

A: The ambiguous property rights of TVEs

Initial rural reforms involved pragmatic efforts to address the basic household necessity of ‘having enough food’ (*chi bao duzi*). The implementation of the household contract responsibility system released farmers’ incentives and the grain yield rose immediately and dramatically to 1984. But the consequent glut of grain led both to difficulties of sale and a web of problems associated with surplus labour in rural areas²⁴. The household registration system which divided urban and rural residents coupled with the manner in which the government rationed the necessities of life in the 1980s restricted surplus labour in the countryside from flowing into the

yet the problem of Chinese state sector reform is that of firms as economic actors in an industrialised economy.

²⁴ Various efforts were made to target the problem. For instance, the adjustment of the crop structure with considerable reduction of grain seeded area by 70 million acres diversified the agricultural economic structure in rural China (Weng, 2003, p.9-11). (Author translated from original Chinese text)

cities²⁵. The then centrally planned industrial production system offered cities no extra resources to accommodate rural surplus labour and required rural areas to *internalise* the surplus labour. Under such circumstances, local township-and-village enterprises (TVEs) flourished in the new sectors of agricultural processing and manufacturing which were classified as sectors 'outside the plan'. The TVEs thus absorbed surplus rural workers and transformed them into non-agricultural labour in the manner of 'leaving the field not the village, entering the factory not the city'²⁶.

The rapid development of TVEs was a grassroots phenomenon that Deng Xiaoping referred to as 'growth out of nowhere'. It mainly occurred in the coastal provinces – (from north to south) Shandong, Jiangsu, Zhejiang, Fujian and Guangdong - of China. These provinces shared a tradition of trade, a legacy of entrepreneurship and obvious geographic advantages. However, the nature of start-up TVEs among these provinces differed. In general, TVEs in Shandong and Jiangsu provinces demonstrated a more thoroughly collective nature than those in Zhejiang, Fujian and Guangdong, where the norm of individual business (*geti jingying*) was more solidly based.²⁷

Although the forms of TVEs enterprise varied in different regions, in practice the majority of TVEs were established as co-operatives and were officially classified as collective enterprises. According to Document No. 1 of the Central Committee of Communist Party in 1983 - "*Decision on Problems in Current Economic Policy in the Rural Area*", regardless of the form of co-operative, TVEs were officially accepted as

²⁵ The government liberalised the prices of producer and consumer goods in the early 1990s. The coupon distribution system of basic living necessities was abolished in 1992. After its abolition, people could directly buy living necessities in the market but as an unexpected consequence, 40 million rural workers flowed into cities by the end of 1992. The lifting of institutional constraints released the surplus rural labour previously locked in the countryside and accelerated the development of labour markets, which has been a crucial factor in encouraging corporate growth and enterprise reform (Weng, 2003, p.9-11). (Author translated from original Chinese text)

²⁶ Translated from the a well-known Chinese saying of the time.

²⁷ The 'TVE phenomenon', originally framed by sociologist Fei Xiaotong in 1983, referred to robust growth of TVEs in Jiangsu province (Fei, 2003, p.119) (Author translated from original Chinese text). Shandong province, a German colony since the early part of 20th century, was one of the major revolutionary bases in the communist-led anti-Japanese war and third civil war in the 1940s. Jiangsu province had been the most prosperous region in Chinese history and is close to Shanghai, the largest industrial city in contemporary China and the strongest industrial base in the planned economy in China. Compared with the collective legacy in Shandong and Jiangsu, Fujian, Zhejiang and Guangdong were neither revolutionary bases nor major recipients of state-planned investment. In addition, most overseas Chinese were originally native of these three latter provinces, and Guangdong province is next to Hong Kong. These provinces were among the first to 'open to the outside world' and were the provinces in which the original Special Economic Zones (SEZs) were sited.

part of the *socialist co-operative economy* so long as they fulfilled five criteria: (1) the enterprise was established on the principle of voluntary participation and mutual benefit; (2) it received indirect guidance from the state; (3) it established democratic management systems and a collective profits retention scheme; (4) the residual claimant right belonged to the collective, and (5) the distribution of profits was based on the principle of labour contributed and dividends were a secondary method of distribution²⁸.

Within this broad framework, local policies that were appropriate to local conditions, such as the rendering to TVEs of land gratis for production and the granting of 'subsidies for aiding agriculture' (*zhinong jijing*) as start-up financial support and compensation for village expenses for collective activities, were crucial for the start-up of TVEs²⁹. The local bureaucrats who governed the townships and the villages were often involved directly in the development of TVEs. These policies and local bureaucratic involvement helped overcome the problems of underfinancing of TVEs and thus facilitated their rapid growth. (Che & Qian, 1999).

A number of scholars from within a largely conventional neo-classical tradition have highlighted the paradoxes and dilemmas raised by the extraordinary success of TVEs in the 1980s and early 1990s, where property rights were vaguely defined. For them, key elements of the property rights of TVEs by contrast with conventional models were as follows: (1) there was no owner in the spirit of traditional property rights theory, (2) there was no residual claimant in the traditional sense, the residual of TVEs being in the form of communal social investment shared by everyone in the community and (3) the TVEs' assets were non-transferable, non-sellable and non-inheritable. The dilemma for them was, however, that (4) the TVEs operated efficiently.

Yet while many studies identify the characteristics of Chinese TVEs, which challenge the traditional property rights theory, they have been conducted within the *paradigm*

²⁸ Author translated from Chinese paper by Li linong (2000, p.76)

²⁹ At that time, the influence of western property rights theory was very limited and as a result 'unconventional' local policies with the simple priority of improving people's living standards rather than conforming to the textbook doctrine of clarifying property rights were adopted.

of the standard property rights framework with which Demsetz's doctrine is set.³⁰ Thus, instead of *challenging* the extant doctrine, these researchers made efforts to *reconcile* TVEs unique experience with the standard property rights theory. The most persuasive studies include (1) repeated game theory and the impact of culture, or 'guanxi' (Weitzman & Xu, 1994), (2) 'procurement theory' in an immature market. (Tian, 2000), (3) risk-sharing theory in a grey market (David Li, 1996) and (4) a theory of competition stimulating the private property (Li, Li & Zhang, 2000)

B: Elaboration of 'reconciliation' models.

Weitzman & Xu (1994) adopt the concept of *repeated game theory* and integrate the cultural element – parameter λ - of a cooperative spirit with standard property rights theory to reconcile the central paradox of their discovery, i.e. the extraordinary success of TVEs in the 1980's in China, despite prevailing property rights being highly ambiguous³¹. David Li (1996) rationalises ambiguous property rights as the result of high transaction costs in the market. He argues "the immature market environment in China makes ambiguous property rights often more efficient than unambiguously defined private property rights." He discusses the concept of ambiguous property rights in the context of control rights in a 'grey market'. This is a similar approach to that of Byrd and Gelb (1990) who emphasise the role of local bureaucrats in economic development and the incentives which motivate them to get

³⁰ The property rights framework of Demsetz (1967) and Alchian & Demsetz (1972) as the theoretical assumptions of these researches. The elements of well-defined property rights were typically summarized as follows:

- 1). To every property is assigned a well-defined owner or owners with exclusive rights of ownership.
- 2). To the owner of the property goes the residual income accruing to the assets.
- 3). The owner has the right to control or determine use of the existing assets, to restructure the property, and to sell or lease it.
- 4). Without well-defined private ownership the firm will tend to operate relatively badly, and any system without widespread well-defined property rights will tend to perform relatively badly." (Weitzman & Xu 1994)

³¹ λ is valued between 0 and 1. A high value of λ near one means a non-cooperative solution of the outcome of cooperative collusion, on the contrary is the one that far from the cooperative solution, thus yielding low individual payoffs. According to their arguments, China is a high- λ society relative to Europe, which by comparison is more of a low- λ society. They used v to reconcile the conflict between TVEs experience and the traditional property rights theory: in a low value of v society people cannot trust each other, however, in a high λ -value society, people trust each other so that well-defined property rights may not be so crucial and an implicit contract may be more efficient than an explicit contract. They conclude that the orthodox of property rights theory is really applicable only to a low- λ society.

involved in the operation of local enterprises. They argue “market imperfections form the basis for local governments’ (officials) active intervention in local firms. ...in a grey market, the local government can become productive for local firms.”

Tian (2000) proposes a similar theory of ambiguous property rights to that of David Li. Tian adopts Davis and North (1971)’s approach to the institutional environment, arguing that “private ownership as the optimal property rights arrangement is based on a set of presumptions that may not be satisfied in a transitional or otherwise irregular economic environment, in which economic freedom is constrained and markets are absent, immature, or imperfect.” In order to reconcile the experience of ‘irregular economies’ with conventional property rights theory, i.e. to ‘generalize conventional property rights theory to include irregular economies’, he proposes that ‘a firm’s optimal ownership arrangement (is) relative to the degrees of economic freedom, decentralisation, and market perfection.’

Following this assumption, Tian (2000) has argued that because of the lack of market institutional arrangements in China’s irregular economic environment, the bureaucrats’ ability to ‘procure government-owned and controlled resources’ is an important input in the ‘production process.’³² He concludes that his theory ‘does not contradict standard theories but rather generalizes them to include imperfect institutional environments’ by integrating the variable ‘ α ’ – the procurement ability – into conventional theory. He finally concludes “collective ownership will dominate private ownership when the institutional environment is significantly imperfect but that private ownership will dominate collective ownership when the institutional environment is sufficiently perfect.”

³² He builds up a sophisticated econometrics model based upon the assumption that “in general, private entrepreneurs have superior abilities in management and bureaucrats have superior abilities in procurement”. He argues that “when the institutional environment (for private ownership) is perfect then procurement ability may be unnecessary”, but that when that environment is less than perfect, such procurement abilities become significant.

2.2.3.4 Does the evidence of TVEs support a new paradigm? - benefits of not assigning property rights

Scholars (Cramton, Gibbon and Klemperer, (1987), Lewis and Sappington (1989), Usher (1998)) consistently challenge the rationality of the 'Coase Theorem' under the condition of zero transactions costs. Usher (1998:7) argues that "when property rights are insecure and it is not known which party will prevail" in a world of zero transactions costs, efficiency may be achieved without an assignment of property rights at all. He also suggests that under such circumstances, the initial allocation of clearly defined property rights may lead to inefficiency. Given the existence of an area of discretion and uncertainty, the absence of a clear initial assignment of property rights can be beneficial, may provide an alternative to the principle of the 'reconciliation' models and thus may provide a challenge to the rationality of privatisation policies generated from the 'reconciliation school'.

These 'reconciliation' models were intellectually based upon the Coase 'conjecture' and on assumptions originating from western society, where the *institutional matrix* is essentially different from that of China in transition. Without questioning this conjecture, scholars from this school attempted to set the unique Chinese experience into a 'speculative framework', which has been constantly challenged in the society within which it was generated. By framing the variables into standard theory, the constraints stemming from the extant bureaucratic system over economic development were ideally 'theorized' as rational 'indispensable' elements of economic efficiency and growth³³. However, conclusions from 'reconciliation' models may not only distort the interpretation and understanding of previous reform, but also confuse the directions for further reform.

This thesis argues, however, that the unconventional property rights of TVEs, while not clarified, were entirely coherent and consistent within the *extant* institutional arrangements of the time (Sanders and Chen, 2002). Aligned with fuzzy property rights, TVEs also innovated unconventional corporate governance structures which were compatible with their property rights arrangements and maximised economic

outcomes. In the view of this thesis, the experience of TVEs may provide empirical support for a new paradigm if we go beyond the ideological constraints of private property.

2.2.3.5 Conclusion on the discussion of Coase Theorem

Scholars from the revolutionary institutional school (e.g. Williams, Bromley) have critically reviewed the conventional wisdom of neo-classical property rights theory. They argue that it is not empirical possession but intelligible possession which constitutes property and that intelligible possession requires social sanction and social legitimisation. The basis of all rights is a civil constitution. "The right depends entirely on the supposition that the claimant will enter with others into a civil society. And, in the last resort, he can be *coerced* into such a society" (Williams, 1977, p. 38). Deducible from this definition of property rights, as Williams (1977) puts it, "the institutional set-up of an economy is the very essence of a collective good, and therefore this institutional infrastructure is a form of *common property* defining the choice sets for all independent economic agents".

As this thesis has argued, the assumption of the Coase Conjecture is that society must essentially operate under the principle of 'rule by law' for the theory to work. Indeed, according to Coase (1959, p.15), clearly defined property rights can only lead to efficient outcomes on the premise that "contracts must truly be enforceable claims, claims that can be defended through the legal system against any transgressions, including those of the government." R.H. Tawney (1981, p.135) has said "... (all rights) ... are conditional and derivative... they are derived from the end or purpose of the society in which they exist. They are conditional on being used to the attainment of that end." The standard property rights theory has been generated from the experience of a *civil society* even though civil society has been a rather rare phenomenon in human history. According to Douglass North's historical research, the formation of such civil society has only been identified in a few countries' history (to include Britain).

³³ Scholars from this school accept the conventional wisdom of 'efficiency' as an 'objective truth', the notion of which has been critically examined and challenged.

Like most countries, in transitional China, property regimes – whether private, collective, or state – operate as authority systems³⁴, far from a system governed by civil law. In the transition, because of the absence of consistent and coherent institutional arrangements which legitimate authority, we have witnessed rampant arbitrary power filling the vacuum and under such circumstances, resource use operates on a first come, first served basis. The real and lasting problems identified throughout the reform process in China is the gradual breakdown of institutional arrangements in the reformed and newly established sectors. With extant (authoritarian and highly hierarchical) institutional arrangements in disarray – and with the former resource management regimes at different levels dismantled – the ability to *coerce* economic actors into new legitimised arrangements is weakened. If the perspective of the Coasian Oeuvre is correct, for the ‘Coase Theorem’ to work the institutional matrix to support a property rights system must be present. To that extent the application of the theorem turns out to be a *dilemma* of circularity in the transitional context.

³⁴ In modern economic conditions, to most of those who own property it is not a means of work but an

2.3 A review of the worldwide privatisation movement

According to many economic historians, the worldwide privatisation movement in the past two decades should be examined in the context of a broader evolution of the world in the second half of 20th century.³⁵ There was a worldwide nationalisation movement with growth in the use of SOEs throughout much of the world, after World War II, which in turn gave rise to denationalisation through divestment of SOEs several decades later.

Developed countries made the first move towards the denationalisation of SOEs in the end of 1970s. Peter Drucker originally coined the term of 'privatisation', replacing denationalisation to describe the British government's sale of public sector industries under the leadership of Mrs. Thatcher (Yergin & Stanislaw, 1998, p.114). However, a much larger scale of privatisation has been witnessed in transitional economies since the end of the 1980s. The scale of privatisation in terms of the number of firms privatised in transitional economies is much greater than in non-transitional economies (Simeon Djankov and Peter Murrell, 2000a)³⁶. The scale of privatisation in terms of the decline of the role of SOEs in the economy (measured by the ratio of SOEs production to GDP) in transitional economies is also much greater than non-transitional economies. According to the calculation of Eytan Sheshinski and Luis Felipe Lopez-Calva (1999), the role of SOEs in the economies of high-income (industrialised) countries has declined from about 8.5% of GDP in 1984 to less than 6% in 1991, a 3% decline is described as 'significant'³⁷. While in many transitional economies, the decline of SOEs has certainly been over 50% of their contribution to GDP after privatisation. In terms of the methods that have been employed in the privatisation, the major method that has been adopted in developed countries (e.g.

instrument for the acquisition of gain or the exercise of power (Tawney, 1978, p.140).

³⁵ The historical discussion of the evolution of postwar privatisation in William Megginson, Robert Nash, and Matthias van Randenborgh (1994), also in Timothy Jenkinson and Colin Mayer (1988), Daniel Yergin and Joseph Stanislaw (1998).

³⁶ They report over 150,000 large firms in twenty-seven transitional economies have gone through the privatisation.

³⁷ Mahboobi (2000), Bernado Bortolotti, Marcella Fantini, and Domenico Siniscalco (1999a) suggests that the share is now probably below 5%. In the flagship of the privatisation movement - U.K., during the last half of 1980s and early 1990s, the role of SOEs in the British economy has been reduced to essentially nothing from more than 10% of GDP 18 years earlier.

UK, Germany, France, Japan) has been share issue privatisation (SIP), while in transitional countries, privatisation through various methods such as restitution, direct sale of state property, mass or voucher privatisation have been employed.

The aims of privatisation, generally speaking, include the promotion of economic efficiency, subjecting SOEs to market discipline, introducing competition and raising revenue for the government³⁸. However, most literature, both theoretical and empirical³⁹, on privatisation in both transitional and non-transitional economies focus merely on the effects of privatisation on productive efficiency or at least on observable variables that are proxies for productive efficiency. The most popular question that these studies address is how does ownership matter for the efficiency of enterprise performance? According to Vickers and Yarrow (1991, p.111): “such questions obviously cannot be given general answers: what holds for a developed, market based economy in western Europe may not hold for a developing country with a thin domestic capital market or severe debt problems, still less for an economy emerging from decades of state control.... a relatively small set of economic principles can be applied to various cases of privatisation.”

In the following sections, this thesis examines the findings of empirical studies on privatisation within the efficiency perspective in both transitional and non-transitional economies, and then identifies strengths and weaknesses of these studies. The review finally leads to the key argument of this thesis and a justification for the research methods employed by it⁴⁰.

³⁸ According to Gibbon (1998, 2000), one reason the privatisation policy has spread so rapidly is that governments have found the lure of revenue from sales of SOEs to be attractive.

³⁹ The importance of empirical evidence on the study of privatisation, as Jean-Jacques Laffont and Jean Tirole (1993) put it: ‘theory alone is thus unlikely to be conclusive’.

⁴⁰ The research method of efficiency school is to compare the performance of SOEs to privately owned firms through analysing tradeoffs between government and private ownership in promoting efficiency. The problems associated with such a method, mainly the difficulties in isolating the effects of

2.3.1 Empirical evidence concerning privatisation in non-transitional countries

The most popular research question of empirical studies on privatisation is whether privatisation has improved the financial and operating performance of divested firms. According to a survey of privatisation, regulatory reform and corporate governance literature delivered by the Harvard Institute for International Developments in June 2000, among 22 more persuasive empirical studies on privatisation in non-transitional economies, only Martin & Parker (1995) document outright performance decline (for six of eleven British firms) after privatisation.

However, the opinions on the impacts and effects of privatisation on firm performance vary significantly among scholars holding different perspectives in non-transitional countries. Some argue that competition and deregulation are more important than privatisation in improving performance of firms (George Yarrow, 1986; John Kay and D.J.Thompson, 1986; Matthew Bishop and John Kay, 1989; John Vickers and George Yarrow, 1991; Franklin Allen and Douglas Gale 1999). Others maintain that privatisation is necessary for significant performance improvements (Maxim Boycko, Andrei Shleifer, and Robert Vishny, 1994, 1996a, b; Shleifer, 1998).

Those scholars who emphasises the importance of competition and deregulation also stress problems in empirical studies in delivering reliable evidence on ownership and efficiency in terms of the difficulties in distinguishing between the effects on efficiency of changes in ownership, competition and regulatory policies. Overall, the evidence of their research suggests that in competitive industries private ownership is generally (though not universally) preferable on efficiency grounds, but that competition may be a more important influence than ownership. One piece of persuasive empirical study in terms of the reliability of data and research method quoted by this school of scholars is the study of Canadian railroads by Caves and Christensen (1980). Caves and Christensen's work shows that once competition was

ownership from other factors impacting the rate of productivity growth, including market conditions and exogenous technical changes will be addressed in chapter 3.

introduced, there was no evidence of inferior performance by publicly owned Canadian National relative to its private rival - Canadian Pacific⁴¹.

The other persuasive empirical evidence quoted by this school is the privatisation experience of the U.K. According to Bishop and Kay (1988), and Yarrow (1989), “the British privatisation programme has raised tens of billions of pounds for the Treasury, has created millions of new shareholders, and has significantly reduced state involvement in enterprise decision making in a number of industries. However, its impact on economic efficiency is rather less clear”.

The need to consider the effects of ownership, competition and regulation jointly is the central to this school’s analysis. According to Vickers and Yarrow (1991, p.113), “the (British) evidence suggests that private ownership has efficiency advantages in competitive conditions, but does not show either public or private ownership to be generally superior when market power is present. Policy towards competition and regulation appears to be very important in the latter case.... Perhaps the only sound conclusion at this stage, therefore, is that the British evidence is consistent with the view that competitive conditions and regulatory environments are key determinants of performance.”

2.3.2 The empirical evidence of privatisation of other transitional countries

One of the most popular assumptions in the transitional economy is that once economic actors are granted ‘rights’ from the state and ‘liberated’ from the plan, positive behaviour will flow. Fisher & Gelb (1991) argue that all former socialist economies carry out reform programmes that include three broad elements: macroeconomic stabilization, liberalization, and institutional reform. Moreover, they emphasise “each country’s institutional reform is fundamentally an account of

⁴¹ In the United States, given the limited presence of SOEs, the privatisation mainly took the form of contracting out. There are well-documented debates regarding the impacts and effects of contracting out which is not the topic of this study. Some evidence supports the competition perspective, such as Donahue (1989) concludes from his study of U.S. privatisation that more of benefits of contracting out have come from the greater scope for rivalry than from private provision *per se* and argues that some privatisation may be necessary but not sufficient for substantial performance improvements.

ownership reform, the distinctive process of unbundling the property rights previously controlled by the state and reassigning them to individuals and groups who assume responsibility for managing the nation's productive assets."

Following the above prescription, the Soviet-bloc and central and eastern European countries have more or less gone through 'big-bang' privatisation programmes throughout the 1990s. These countries have employed a wide range of methods of privatisation, including asset sales (Hungary and Eastern Germany), voucher privatisation (the Czech Republic and early Polish divestitures), spontaneous privatisation (Slovenia), share offerings or a combination of techniques.

Regarding the evaluation of privatisation in these countries, most empirical literatures take the efficiency perspective and address how privatisation impacts on firm-level performance. In spite of much greater difficulties in isolating the effects of privatisation, the problems of significant selection bias and omitted variables and statistics in transitional economies, the results of empirical studies from post-socialist Soviet-bloc and central and eastern European countries are surprisingly consistent.

In central and eastern European countries, almost all empirical literature that has been reviewed⁴² directly or indirectly suggests that privatisation works in terms of impacts on firm-level operating performance at different stages of reforms. Furthermore, the results of these studies are surprisingly consistent in the following aspects. Firstly, private ownership, concentrated private ownership in particular, is associated with greater firm-level performance. Secondly, among various privatisation methods,

⁴²Listed below are several most persuasive literatures in terms of sample size, methodological vigour.

Claessens, Djankov, & Pohl (1997) examines determinants of performance improvements for sample of 706 Czech firms privatised during 1992-95.

Claessens & Djankov (1996b) examine the relationship between ownership concentration and corporate performance for 706 privatised Czech firms over the period 1993-1997.

Pohl, Anderson, Claessens & Djankov (1997) compare the extent of restructuring achieved by over 6,300 private and SOEs in seven eastern European countries during 1992-95.

Dyck (1997) tests and rationalises Treuhand's privatisation approach that emphasized speed and sales to existing western firms over giveaways to employees and sales to capital funds in the privatisation of eastern Germany's SOEs.

Frydman, Gray, Hessel and Rapaczynski (1999) examine influence of ownership structure on performance using a sample of 90 SOEs and 128 privatised companies in the Czech Republic, Hungary and Poland. Frydman, Gray, Hessel and Rapaczynski (2000) compare the ability to increase revenues between privatised firms controlled by outside investors and firms controlled by insiders or the state.

foreign ownership and non-employee (outsider) ownership are associated with significant (sometimes dramatic) post-privatisation performance improvement. Thirdly, Andrew Berg, et.al (1999) examined the 'U-shape' pattern of aggregate output in 26 transitional economies. They argue that privatisation is critically important in promoting rapid recovery from the initial output fall in every central and eastern European country immediately after the collapse of socialism in 1989-1991. Their results strongly support the radical 'big-bang' approach to transition.

In the former Soviet-bloc countries, in spite of the much greater contraction in output that occurred after 1991 and lack of the 'U-shape' so far, literature that have been reviewed regarding the impacts of privatisation on firm performance yield similarly unanimous conclusions. These studies, including more academically persuasive works by Nicholas Barberis, Maxim Boycko, Andrei Shleifer, & Natalia Tsukanova (1996), Earle (1998), Earle & Estrin (1998), and Simeon Djankov (1999a, 1999b), suggest that privatisation works in the sense that firm performance improvement is associated with the mass privatisation program of the early 1990s. Furthermore, these studies find that the performance of outsider controlled (including foreign share ownership) privatised firms improved more than firms privatised through other methods.

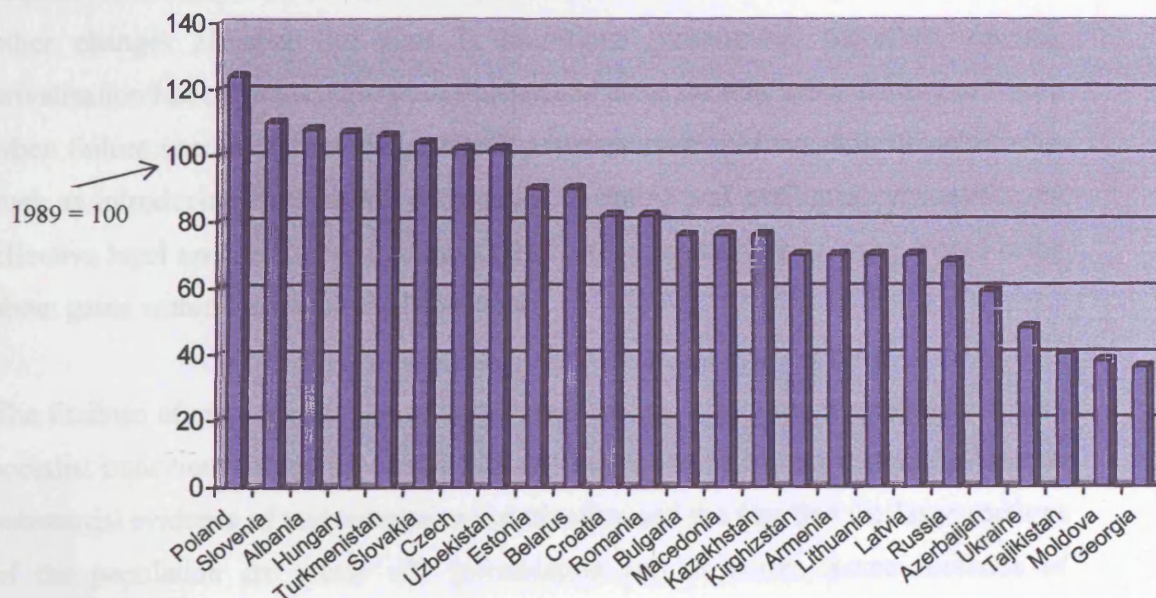
Overall, a review of empirical studies of eastern Europe and the former Soviet-bloc by Djankov and Murrell (2000a, 2000b) conclude that privatisation works in the sense that privately owned firms perform statistically significantly better than SOEs while there is little evidence that privatisation has worsened firm performance.

Compared with the studies on the impact of privatisation on firm performance, there is very little empirical literature regarding the impact of privatisation on employment and the results are ambiguous. These studies document employment decline (sometimes dramatic) following privatisation and argue that employment decline is associated with virtually all firms regardless of the nature of the reforms introduced.

Dilemma

Empirical studies document (significant) improvement of firm efficiency after privatisation at the micro-level in post-socialist transitional countries of the former Soviet-bloc and central & eastern European countries. However, the growing efficiency of firms in these countries did not give rise to the improvement of macroeconomic performance of these countries in the past decade. On the contrary, as indicated in the following Figure 2.1, most of these countries suffered economic contraction to a different degree in the past decade and only Poland, Slovenia and Hungary managed to enjoy a marginal growth. Neither did a majority of the population of these countries benefit from the growing efficiency of firms, as most of these countries report growing poverty. Here comes the dilemma according to empirical evidence: individual firms are more efficient, however, micro-level efficiency appears to lead to macro-level contraction.

Figure 2.1 Levels of GDP of transitional countries in 2001



Source: adapted from UN, *Economic Survey of Europe*

Some researches interpret the better performance of Hungary and Poland to be the result of the privatisation methods chosen and the shorter length of time these countries had spent under Communism. Therefore, according to them, it is unwise and

inappropriate *methods* of privatisation that failed, not privatisation and that overall, privatisation still works. Their interpretation is neither satisfactory nor realistic in addressing the problematic results of big-bang privatisation. They ignore the fact that the Polish government did not immediately launch a large-scale privatisation program, rather it launched reforms that deregulated prices, introduced foreign competition to many industries, and signalled that hard budget constraints would be pursued (Brian Pinto, Merek Belka, and Stefan Krajewski 1993). At the macro level, Poland performed strongest among transitional countries in central and Eastern Europe in terms of growth of GDP in the past decade.

Another explanation is raised in a macro-economic study by Sachs, Zinners & Eilat (2000) examines the relationship between privatisation and overall economic performance measured by change in GDP from before the transition in these countries. They conclude that change in ownership is not enough to improve macroeconomic performance. However, privatisation still works! They argue that it is impossible to completely isolate the impact of privatisation on firm performance from other changes affecting the firm in transitional economies; therefore, overall, privatisation has improved firm performance and there must be other factors to blame when failure occurred. They suggest that privatisation combined with other reforms such as introducing hard budget constraints, incentive and performance contract, an effective legal and regulatory framework and removing barriers of entry would bring about gains within the transitional economy.

The findings of empirical literature from the efficiency school on privatisation in post socialist transitional countries can be summarised in the following statement: despite substantial evidence of macroeconomic contraction and the fact that the large sections of the population are worse off, privatisation *per se* works, some methods of privatisation being less successful with various exogenous factors impacting upon the success of privatisation.

Most literature on privatisation programmes in the former Soviet-bloc and central & eastern European countries, the assumptions and conclusions are the same, that is, privatisation is necessary and it works. The literature does not challenge the privatisation perspective. Are there alternatives to privatisation? Have other reforms

such as hard budget constraints, incentive and performance contract, and removing barriers of entry been successfully applied to SOEs? Have other reforms worked, at least sometimes, without being combined with privatisation?

2.3.3 Chinese experience: could economic reform coupled with privatisation lead to even greater performance?

The evidence from China suggests that non-privatising reform instruments including enterprise restructuring, concentrating on improving the allocation of property rights and incentives, can yield economic growth even without privatisation, and market liberalisation, competition and price deregulation are more important. So far, the most persuasive literatures, as examined in Bai, Li and Wang (1997), Lin, Cai and Li (1998), argue that the key constraint on privatisation in China is the fact that SOEs serve as the country's social safety net. In 1995, China's total labour force amounted to approximately 623.9 million persons, 71.1% of those workers were still employed in state firms (Chinese Statistical Yearbook, 1996, p.226), which means, about seven out of ten urban workers in China were still employed by state firms. State-firms' proportion of total urban employment has not declined significantly during the reform period, the first 15 years in particular, compared with the far more dramatic decline in the state sector's share of national industrial output.

However, the *privatisation fundamentalists* raise the question whether China's economic reform coupled with privatisation could lead to even greater performance. Some researches conclude that it seems likely that Chinese reforms would be even more effective if coupled with privatisation. The reasoning for their arguments is that privatisation definitely works; so non-privatising reforms combined with privatisation should work even better. Some studies classify the Chinese experience as one method of privatisation, that is, privatisation from below through the start-up of new private businesses in a socialist state. Havrylyshyn and McGettigan (2000) stress the importance of this type of economic growth in transitional economies and Chinese experience is referred to as one of empirical evidence of this method of privatisation.

This thesis argues that the Chinese experience cannot be used to justify any form of privatisation. Instead of tracing the elements of privatisation in the experience of China's transition in the past two decades, this thesis asks the question: Are there empirical results from China that tell us something about the appropriate balance and role of government and the private sector – for in reality the (success?) story of the post-reform Chinese economy involves a mixed economy with large government. Would empirical experience in China support a challenge to classical theories such as the fundamental theorems of welfare economics (second Pareto-efficient) which form the basis of the 'market failure' approach to government intervention and the Coase 'theory of the second best'? Furthermore, the empirical case study of this thesis will illustrate a typical 'path dependence' feature of China's reform and indirectly address the question of 'whether China's economic reform coupled with privatisation could lead to even more successful economic performance'.

Chapter 3: Methodology

Following up the literature review in chapter 2, the first part of this chapter attempts to trace the formation of neo-classical orthodoxy in the studies of transitional economy inside China and examines the problematic methodology associated with it. In part two, three and four of the chapter, the intellectual journey of searching research questions and research methodology is addressed. Through a critical review on popular methodology associated with the neo-classical school, this thesis argues the rationale of adopting an institutional approach on the study of change of property rights. In the last part of the chapter, the institutional framework on the study of property rights and ownership adopted in this research will be presented and justified. In the opinion of this thesis, the evolution of market institutions of private property are embedded in the change of a broader domain of social and economic relations within society. The establishment of enforceable property rights institutions, regardless of ideological nature (whether public or private), is a historical process *embedded* within contextual circumstances of society.

3.1 Review of the methodology adopted in research the Chinese transitional economy

3.1.1 Academic opportunism

Western economics was introduced into China in the late 19th –century. Ever since its inception, it has been incorporated and interpreted within the framework of ancient Chinese philosophy. It was translated into Chinese as *jingjixue* – the study and the knowledge of how to ‘govern and benefit people (*Jinshi jimin*)’. Economists, translated as ‘*jingjixuejia*’, are those who learn and study in order to practice and to serve and *rule* the country with broad knowledge and great ability, the so-called *jingshi zhicai*.

There is a historical and complex relationship between intellectuals and the supreme ruler of the country deeply rooted in Chinese culture – the relationship of ‘the ruler and his ministers as subjects (*junchen*)’- what has been institutionalised through the civil-servant selection system (*kejuzhi*) for two thousand years. Within the framework

of this system, the academic merits of Chinese intellectuals were designed to bring them qualification and promotion in the national governance hierarchy. However, intellectual merits *per se* would not bring them into favour with the (governing) class unless the 'supreme ruler' recognised and accepted them. As a result of the legacy of the 'civil-servant selection system', Chinese intellectuals are not merely academics, but more important, they are *opportunists*.

The phenomenon of academic opportunism also exists in the west. Earl (1981) dispenses with the usual premise that economists are committed to discovering the truth and instead adopts the opportunist assumption that economists are interested primarily in their careers and other individualistic goals. Intellectual opportunism within an enclosed highly hierarchical society, such as China, in which the supreme ruler holds absolute power, entails a latent crisis – when the 'supreme rulers' make wrong decisions, or, go mad, instead of behaving as a resisting force, intellectual opportunists tend to justify them, making the situation worse¹.

One of the features of intellectual opportunism is that it leads to the reinforcement of 'orthodoxy', produces 'absolute truth' and moulds society with stereotype and cliché to serve the needs of the *ruling class*. Criticisms are rejected, not because they lack intellectual merit, but, rather, because they go against the grain of the prevailing orthodoxy. Only the evidence that accords with *a priori* belief is acknowledged. As Alfred S. Eichner (1983) puts it: "economics has, in this respect, become a closed system of ideas, more like a religion."

This form of religion is often modified contingent upon the ruler's view. In many Chinese economists' bibliographies, the number of their opinions that have been adopted or quoted by high ranked officials is put in the most prominent place and evaluated as their most important academic achievements. One of the other 'religions'

¹ In early 1950s, Chinese economist Ma Yinchu, recommended population theory to Mao Zedong and suggested Mao control the rate of birth; Mao rejected his suggestion and called on economic academics to criticize his theory. Ma lost both his official and academic posts and lived a miserable life at the edge of society after outright criticism from his academic colleague. By the time Chinese government faced the increasing challenge of the huge population in the late 1970s, the population had grown to 1 billion from 600 millions in the early 1950s. Besides this case, in the Great-Leap Forward in the 1950s-60s, and other environment -destructive projects in not too distant past, the intellectual opportunism was alive and kicking.

of Chinese opportunist is their worship and blind faith in anything with the label of 'western economics' (*xifang jingjixue*).

One of the major reasons accounting for the blind faith in all things western is that there is very limited knowledge and understanding of non-Marxian western economic theories among Chinese economists as a result of their isolation from the world for almost half a century. As the old orthodoxy (of Marxism-Leninism-Maoism) has been abandoned, there has been a theoretical vacuum to fill. Given the lack of the spirit of the 'independent intellectual' and self-criticism combined with eagerness for quick academic success and instant benefit, Chinese economists have often found themselves bewildered as they try to square imported theories (often misinterpreted) with the arguably unique experience of the Chinese economy

3.1.2 From Marxism-Leninism to neo-classical doctrine

For historical reasons², Marxism-Leninism was adopted and extended with Maoism and became the orthodoxy of Chinese social economic research under the Mao regime. Much socio-economic theory possesses a degree of rationality regarding the research subject and its historical context. But the contextual rationality of the theory should not be elevated to universal and absolute truth. By the same token, neither should the contextual rationality of the theory be neglected, this thesis argues that proper criticism of economic theory accumulated under Maoism should first assimilate its contextual rationality and then reject the dross, rather than involve outright denunciation of the whole theoretical system.³

According to Marx's *dialectical materialism*, the relations among people in the course of their productive activity are, fundamentally social relations.⁴ In studying

² When various social economic theories were introduced into China in the late 19th and early 20th century, China was a 'half-colony, half-feudalism' country and then experience foreign invasion and civil wars in the first half of 20th century. The adoption of Marxism-Leninism in China was the choice of that history.

³ Unlike Chinese scholars' unanimous criticism on economic situation under Mao as a 'disaster', some western economists, in the early 1980s, Hinton, latest, Morris (2000), conducted empirical researches and argue that China has made great economic achievements under Mao in the sense that the country has established a full range of modern industry and basic social welfare system offering free education and medical care to its people, although at a low level.

⁴ In Marx's 'The German Ideology'

economics, the study should not only focus on economic behaviour such as production, distribution and exchange, but also on how human beings are shaped through their interactions. The process of economic reproduction is in essence the reproduction of social relations.

Marx regards capitalism as an enormous leap-forward for human beings in terms of the expansion of productive forces. But arguably it is an illusion to regard capitalism as 'natural' or eternal. Marx believes that people can transcend capitalism and organize production and distribution in a more 'rational' fashion. Marx's political economy is concerned with how capitalism will be transcended. Given this perspective and the contradictory ideological commitments between Marxian and non-Marxian economists, there has been and remains little dialogue between them (D.M.Hausman, 1994). Under Mao's regime, extreme focus on social relations resulted in intensive mass movements associated with 'class-struggle' haunted all over China. After Mao, the theory of 'class-struggle' was criticised and quickly abandoned. The core perspective adopted under Deng was that 'seek truth from facts'.

However, the rationality of Marxian arguments on social relation was abandoned when Chinese economists turned to absorb non-Marxian theories. Given the fact that diversification of western economics theories was so enormous during the time of Chinese isolation, Chinese economists could hardly digest a wide range of theories in so short a time. However, due to eagerness for instant practice and quick success, Chinese economists frequently absorbed western theories uncritically and often left their methodology unchallenged. As indicated in chapter 2, Chinese academics adopted the neo-classical theory of property rights as 'absolute truth'. Aligned with this uncritical adoption, the methodology of neo-classical school - the general equilibrium theory, the deductive reasoning, the assumptions of rational choice and value-free - were brought in line and formed the 'new' orthodoxy⁵ of economic research.

⁵ Scholar He Qinglian published her book 'The trap of the Modernisation' in which she sharply criticized the rent-seeking, outrageous corruption and enlarging rich-poor gap in Chinese society in 1996. Her criticism triggered an intensive debate on the question of whether the morale (value) is the research object of economics in 1998. Economists, especially those with foreign training backgrounds argued that economics, as a 'science', should be 'value-free'.

3.1.3 The dominant neo-classical presence

While most Chinese economists have wholeheartedly embraced neo-classical orthodoxy as the new doctrine of 'economic science' in recent year, it has been challenged where it originated. As an example, W. Leontief (1981) has argued "the king is naked": ...economics profession lags intellectually⁶, the use made of mathematics by economists is largely inappropriate, economics is far from being a science".

Many economists criticise the methodology of neoclassical theory, in Edwards's (1998, p.36) term, as an 'economistic fallacy' that "identifies an abstract model with reality and considers empirical behaviour only insofar as that behaviour corresponds to the 'formalistic model'. This particular methodology, as Wiles (1981) puts, is axiomatic reasoning, together with excessive abstraction and an insistence on economic determinism and constitutes the 'Ricardian vice'.

For many, economics has become a closed system of ideas more like a religion than a science (Alfred S. Eichner, 1983). Every self-respecting ideology acquires a social power base and uses monetary, legal, military, and other inducements to perpetuate itself. Neoclassical theory gives credibility to a set of ideas that has been instrumental in the development of western civilisation and has helped preserve the political values of the larger society. Neo-classical theory is the basis for the notion that a market economy is a self-regulating mechanism, and it is this notion which then makes it possible to deny the need for any but a minimal involvement by the government in the economy. The settled dogma is that, to some extent, it is more important to limit the power of the state than to understand how the economic system works.

Neoclassical theory is the one thing most western economists have in common and it is the dominant 'establishment' within the profession. Earl's study (1981) shows how the academic hierarchy can force the *neophyte* economist to work within the dominant neoclassical tradition. As indicated in chapter 2, external studies of Chinese transitional economy have been bewildered with dichotomy - private ownership and

⁶ He made the argument at the annual proceedings of the American Economic Association 1981.

public relationship, privatisation and nationalisation, the market mechanism and government intervention all apparently irreconcilable opposites in a contradiction. Inside China, economists who have had a western educational background, especially those with neo-classical training at leading American economic institutions have been appointed to key posts in a variety of academic and official institutions. As a result, the neo-classical school has had an influential presence on the study of China's transitional economy and increasingly exercised its muscle on policy making since 1990s onwards.

The discussion on the formation of new orthodoxy and stereotype in economic theories and policies in transitional China is not the research question of this study. However, the awareness of the problematic presence of neo-classical orthodoxy leads to the search of research questions and alternative research methods for this study.

3.2 The method of identifying research questions

“At the beginning of my journey, I was naïve. I didn't yet know that the answers vanish as one continues to travel, that there is only further complexity, that there are still more interrelationships and more questions.” (Kaplan, 1996, p.7)

At an early stage of this study, literature⁷ reviews was a source of research problems and shaped the research framework. But, an understanding and interpretation of literature did not exist independently of my personal experience⁸. Instead, the

⁷ *Technical Literature*: Reports of research studies and theoretical or philosophical papers characteristic of professional and disciplinary writing that can serve as background material against which one compares findings from actual data.

Non-technical Literature: Biographies, diaries, documents, manuscripts, records, reports, catalogues, and other materials that can be used as primary data, to supplement interviews and field observations, or to stimulate thinking about properties and dimensions of concepts emerging from data.

⁸I had my basic economics training at economics department of Nankai University from 1988 to 1992. Afterwards, I worked as a sales manager in a high-tech company. As a sales manager, I travelled intensively around China and traded with different kinds of customers ranging from large-medium sized SOEs, small SOEs, TVEs, to individual businessman from a large number of industrial sectors. The society is the best university and observations and analysis on real issues through working experience gave me in-depth understanding. Different people presented widely diversified view on the changing society and their pragmatic interpretation on the new norm of 'market socialism'. It was a process of making attempt to applying the 'western economics' that I have learned at University to real

interactions between the literature and my empirical experience strongly influenced the search for research ‘targets’ in this study.

There is a Chinese saying that insights do not just occur haphazardly to an empty head, rather, they happen to prepared minds. The accumulated knowledge and experience that we carry within our heads inform our research in multiple ways, even if we use them quite unselfconsciously. I am aware that personal experience can increase sensitivity if used correctly. The issue, as Dey (1993) raises, is not whether to use it, but how.

Researchers have learned that a state of complete objectivity is impossible and that in every piece of research – either quantitative or qualitative - there is an element of subjectivity. What is important is to recognize that subjectivity is an issue and, as a researcher, to take appropriate measures and keep a balance between subjectivity and objectivity. In this research, objectivity is interpreted as flexibility and openness, a willingness to think comparatively, to obtain multiple viewpoints and recognising that there is a danger of the intrusion of bias into the research. It implies my acknowledgement that my understandings are based on values, culture, education and training, that my experience might be quite different from others and more important my interpretations and understanding might be wrong⁹.

As Silverman (1993) argues, literature can be used to stimulate questions. In addition to personal and professional experience as a source of research problems, a second

issues and then learned the lessons that how naïve to believe that there is a ‘law’ or ‘an universal theory’ to explain different phenomenon.

⁹ The churn of Chinese transition involves significant redistribution of wealth and the social status associated with it (in terms of the re-emergence of classes in Chinese society). I am not a complete loser in the redistribution, but neither am I the winner/successor who benefit the most. Regarding the research on the change of property rights and ownership, I am aware of the possible ‘bias’ associated with my individual *status quo* – the ideological and ethical bias towards the new rich and the emerging private property regime - which may give rise to subjective judgement on existing literatures (neo classical property rights school in particular) and unintentional favour to collectivism in my field work and in the interpretation and analysis of raw data. If I am one of those 20 million new Chinese millionaires (in US\$), what would be my choice and focus of research question on such a sensitive topic of the change of ownership and property rights? Would I wholeheartedly embrace the neoclassical regime and make use of its instruments and authority as legitimate arsenal to justify theoretical conclusions and empirical policies that favour a millionaire *status quo*? It is very difficult to isolate academic research from individual emotions and subjective values. What matters is that I am aware of the danger and thus fight against the stereotype and bias on the journey of this research.

source of (research) problems is the technical and non-technical literature. At the beginning, I turned to literature to formulate questions. However, I am aware that familiarity with relevant literature can enhance sensitivity, just as it can block creativity. Flexibility and openness are linked under such circumstances with the ability to sustain a fair amount of ambiguity. As indicated earlier, the literature review has stimulated my research. It has identified the contradictions and ambiguities among the accumulated studies and writings, and has suggested research targets in order to resolve the paradox and dilemma.

Through the literature review, this study has attempted to identify the elements which are dissonant with my experience. The literature review on the related subjects of 'ownership', 'property rights', 'institutional change' and 'transitional economies' points to a relatively unexplored area and suggests that a new approach is needed to solve an 'old problem'. This identification finally leads to raise research problems of the study.

3.3 Using appropriate research methodology to address research questions

The research questions determine the research methods that used to answer it. Learning and analysis of philosophical writings and existing theories are used as analytic tools in the process of determining research methods. In this study, the principle involved in the application of theories and methods is that there is no 'universal covering law'. Applications should be carried out in a way that is appropriate according to the circumstances.

3.3.1 Limits of the methodology of neo-classical approach

“Premises assumed without evidence, or in spite of it; and conclusions drawn from them so logically, that they must necessarily be erroneous”

Thomas Love Peacock, *Crotchet Castle*

Textbook trained economists, argues McCloskey in his *Rhetoric of Economics* (1985), often pay obeisance to an outmoded philosophy of science, which he labels as ‘modernism’. Modernism, McCloskey tells us, is characterized by the following commandments: “(1) Only the observable predictions of a theory matter to its truth; (2) Facts and values belong to different realms of discourse, so that positive propositions are always to be distinguished from normative ones; (3) Any scientific explanation of an event subsumes the event under a covering law; (4) Introspection, metaphysical beliefs, aesthetic considerations, and the like may well figure in the discovery of any hypothesis but are irrelevant to its justification” (McCloskey, 1985: 510).

Although many professional philosophers have discarded the notion of modernism, economists continue to believe that the only ‘fundamental’ proof of an economic assertion should be an objective, quantitative test. Apart from this, there is a disinclination to appraise economic theories in terms of their novel empirical content (De Marchi, 1991, p.504-9). An increasing tendency in modern economics is to pursue theorizing as an intellectual game; the notion that grounded by even more sophisticated methodologies is of value in itself even if it does not produce any substantive findings about the economy is even prevalent.

The debate over whether economics is a science has occupied economists for the last two centuries and remains a question today. Even if economics is a peculiar science, it is a different *kind* of science from natural science¹⁰. However, orientation and

¹⁰ The objects of nature science research and that of social economical are different, the natural objects, such as the atom, light, are eternally existed. However, the objects of social economic study are countries, enterprises, families and human beings themselves, which are historical-relevant. Historical explanations at best yield sufficient but not necessary conditions for a certain kind of event to occur or to have occurred.

discovery in the natural sciences always inspires strands of thought in economics and other social science. The hypothetical-deductive model is related to the determinism of conventional physics. The model is based on the notion that hypothetical universal laws are capable of being tested against particular events but are not themselves reducible to observations about events.

Unlike scientific explanations, socio-economical explanations depend upon historical evidence that involve factual evidence, which is usually so sparse and so ambiguous as to be compatible with a large number of alternative and even conflicting interpretations. Hempel (1942) argues: “virtually all historical explanations are *pseudo-explanations*: they may be true or they may be false but we will rarely know which is the case and the historian is not typically prepared to help us to distinguish one from the other.... when offered an explanation that does not yield a prediction, that is, when instead of an explanation we are offered ‘understanding’.”

Hempel (1942) continues: “...in any case, when explanation is not matched by predictability, we should ask, is it because we cannot secure all the relevant information about the initial condition, or is it because the explanation does not rest in any way on a universal law or at least a loose generalization of some kind, as with so many historical explanations?” If the latter, as Elster (1989) argues: “then we are definitely being handed chaff for wheat because it is not possible to explain anything without reference to some larger set of things of which it is itself an element.”

Karl Popper’s works propose that “no universal statement can be logically derived from, or conclusively established by, singular statements however many, but any universal statement can be logically contradicted or refuted with the aid of deductive logic by only one singular statement”. In the sense of true premises necessarily implying true conclusions, there is absolutely no guarantee that what we have so far experienced will persist in the future. As M. Blaug (1994, p.26) puts it “the problem is precisely how logically to infer anything about future experience on the basis of nothing but past experience.” It is true that people constantly generalize from individual instances out of habit and the spontaneous association of ideas, but such inferences were logically unjustifiable. A logical fallacy originated from Popper is that “there is no logic of proof but there is a logic of disproof.” According to Popper’s

degrees of corroboration, a theory is corroborated, not if it agrees with many facts, but if we are unable to find any facts that refute it.

Methodologists raised the *problems of induction* (Blaug, 1994, p.1), which argues that one cannot make inductive generalizations from a series of observations because the moment one has selected certain observations among the infinite number of possible ones, one has already settled on a point of view and that point of view is itself a theory. "There are no 'brute facts' and all facts are theory-laden....Daily life is full of *prima facie* examples of induction. In ordinary life as in science itself, we acquire knowledge and improve on it by a constant succession of conjectures and refutations, using the familiar method of trial and error." (ibid: 3)

Another question raised by methodologists, as Popper identified, is the problem of '*immunising stratagems*'¹¹. The essence of immunising stratagems is that all 'true' theories are merely provisionally true. Under the cover of this 'stratagems', no conclusive disproof of a theory can ever be produced; for it is always possible to say that the experimental results are not reliable. (Popper, 1965, p.50)

Methodologists (e.g. Malinvaud, 1984, Haavelmo, 1940) analyse the problem of *statistical inference* in which they identify two types of errors:

1. Type I error: the decision to reject a hypothesis that is in fact true.

Type II error: the decision to accept a hypothesis that is in fact false.

Some methodologists elaborate that scientists typically have a greater fear of accepting a falsehood than of failing to acknowledge a truth. They behave as if the cost of Type II errors were greater than that of Type I errors. This decision is not itself a matter of logic, however, nor can it be justified simply by pointing to the history of past scientific accomplishments (Braithwaite 1960 p.174; Kaplan, 1964, Chapter 6). Blaug (1994, p.21-3) quoted Neyman-Pearson's argument, "Economists are admirably equipped to appreciate the value of purely normative methodological rules, because they appeal to them every time they estimate a statistical relationship". Thus, he (ibid) concludes " whenever the predictions of a theory are probabilistic in nature,

¹¹ . Duhem-Quine thesis: no individual scientific hypothesis is conclusively falsifiable, because we always test the entire *explanans*, the particular hypothesis in conjunction with auxiliary statements, and hence can never be sure that we have confirmed or refuted the hypothesis itself.

the notion of assessing evidence without invoking normative methodological principles is an absurdity”.

As a conclusion to recent research on methodology, Blaug (1994, p.113) sums up and raises a number of concerns: “(1) Just as there is no logic of discovery, so there is no demonstrative *logic of justification* either; there is no formal algorithm, no mechanical procedure of verification, falsification, confirmation, corroboration. (2) How can we acquire apodictic knowledge of the world when all we can rely on is our own unique experience? (3) A study of the philosophy of science can sharpen our appraisal of what constitutes acceptable empirical knowledge, but it remains a provisional appraisal nevertheless. We can invite the most severe criticism of this appraisal, but what we cannot do is to pretend that there is on deposit somewhere a perfectly objective method, that is, an intersubjectively demonstrative method, that will positively compel agreement on what are or are not acceptable scientific theories.”

The evaluation and analysis of the above philosophical thoughts are beyond the scope of this study. However, a historical review of the evolution of methodology suggests that eternal ultimate truths do not exist and that the appropriate rationality of different methods is rooted in different conditions. The awareness of *problems of induction*, ‘*immunizing stratagems*’, and *Popper’s falsification*, provide this study with analytical strength and methodological direction.

Enlightened with these methodological insights, this study identifies the problems of *immunising stratagems* and *statistical inference* that are embedded in mainstream research literatures on the question of property rights that raise a web of contradictions and ambiguities in transitional economies. Without an understanding of methodological issues, it would be more difficult for me to interpret the problem of ‘Coase Circularity’ associated with the orthodox Coase Theorem. Based on a critical understanding of the Coase Theorem, as indicated in the literature review in chapter 2, this study identifies that a method of reconciliation, rather than falsification, has been embedded in the recognised studies of the changes of property rights in transitional China. More importantly, the enlightenment I have gained from the above

philosophical thinking has directed me to adopt research methodology with a critical attitude and it had led me to the final settlement of the research question of this study, originally raised from my bewilderment grounded in the incompatibility between my empirical experience of transitional China and extant theoretical explanations of it.

3.3.2 Methodological differences between institutional & neo-classical approaches in economic research

Blaug (1994) argues that the preconceptions of the investigator strongly influence his search for empirical evidence. According to him, there are three related preconceptions (i) the kind of model or theory constructed, either descriptive or predictive; (ii) the unit of analysis used, either the institution or the individual; and (iii) the psychological perspective of the theorist, either opportunist or subjectivist.

Neo-classical approach seeks to construct predictive theory. A law is explained by the demonstration that it is a logical consequence of these principles, and a fact is explained when it is shown to follow from these along with certain initial conditions. Individual behaviour is explained when it is deduced from basic postulates (utility functions) and initial conditions (income distribution and prices of goods). The predictive model is tested empirically by comparing deductions (quantitative predications or explanation) with observations. On the other hand, institutional theorists seek to construct models involving pattern. The pattern model is tested empirically by comparing hypothesised institutional structures (qualitative patterns) with observations. Abraham Kaplan (1996, p.7) has proposed the concatenated (pattern) theory. According to which, a fact is explained by a concatenated theory when its place is made manifest within a pattern. Individual behaviour is explained when it is shown to fit into an institutional structure of behavioural norms, and the institutional structure is explained when it is shown to fit into a cultural context.

In constructing pattern models, institutional theorists spend great efforts on making the pattern or theoretical structure realistic. Thus, the pattern models of institutionalists have much in common with anthropology and its unit of analysis,

cultural pattern. As a contrast, in making predictive models, neo-classical approaches de-emphasise structural realism. (Doug, p. 337-339)

The institutional approach takes the psychological perspective of opportunism, which grounds the roots of human action in institutional structures (norms, working rules and expectations) rather than in individual preferences. This perspective conceives of individual preferences as largely derived from the cultural-institutional milieu into which the individual is born (ibid, p.350).

Institutional theorists seek structural evidence, while the neo-classicals seek predictive evidence. "Institutionalists, naturally enough, generally seek evidence regarding institutional norms of behaviour, rewards, and sanctions, and power relations."(ibid, p.342) Wilber and Harrison (1983) sum up the institutionalist's search for validation: "Evidence in support of an hypothesis or interpretation is evaluated by means of contextual validation. This technique is a process of cross-checking different kinds of sources of evidence (historical studies, questionnaires, case studies, and so forth), and it serves as an indirect means of evaluating the plausibility of one's initial interpretations."

In institutionalism, what Thomas Kuhn (1970) would call 'normal' science consists of conducting case studies and using them to elaborate on or extend a basic pattern. Revolutionary science consists of constructing new basic patterns to replace old ones, which no longer can be made to fit the 'real' world. Institutionalists seek to *understand*, not predict.

3.4 The adoption of an institutional approach in this study

3.4.1 The need to balance analytical vigour with contextual circumstances

The above discussion on differences between two very different methodologies does not imply an easy evaluation of whether one is superior to the other. Different research aims and objectives demand different methodologies. In this study, instead of adopting Demsetz's concept of property rights, the concept of property rights is regarded as a set of *socio-economic relations*. Thus, the preconception of this study is not value-free, but value-laden, a characteristic lacking in Chinese economic research as discussed at the beginning of this chapter.

Under Deng Xiaoping, the method of Chinese economic research was chosen in the context of 'practice (being) the only criterion to test the truth' (*shijian shi jianyan zhenli de weiye biao zhun*). The question this raises is 'what is the *truth*'? A dominant theme is 'development is the top priority' (*fazhang shi yingdaoli*). But this raises further questions. What kind development is the top priority? Is it economic growth with vast environment disaster and a growing gap between the rich and poor? Is it growth involving increases in profits of non-state owned businesses achieved by exemption from industry regulations applied to SOEs only¹²? Should the decentralisation of ownership and property rights only grant rights and benefits without constraining relevant duties and responsibilities? Who should be granted the rights and allowed to take benefits and how? Should the new arrangements of property rights and ownership be a contributive element to sustainable development or the other way around? All these questions are value-laden. To such a research object, 'science-like' analytical vigour¹³ should be traded off against relevance to reality.

¹² For example, in Chinese mine industry, SOEs cover the workers safety payment and according to regulation invested 7% of annual turnover into safety maintenance, non-state sectors didn't spend in safety sector and in order to compete with the non-state sector, SOEs lifted the safety regulations in 1990. The latest disaster result was Jan.2002, within 2 days, 3 mines in 3 different provinces collapsed and 51 workers died.

¹³ Chinese have doubts about the reliability of statistical data, which are allegedly modified and manipulated for contingent reasons. Hence, there is the worry about the research merely relied on numbers is somewhat similar to a fancy building built on the base of sand.

This research is a birds-eye view of the individual economic actor's behaviour within the setting of the larger environment, focusing on the interactions between the individual actor and the institutions which shape institutional change. In order to conduct it, a non-teleological approach is adopted.

3.4.2 Adoption of non-teleological openness

A body of criticism of orthodox equilibrium theory in economics corresponds closely with developments noted in the natural science. As the determinism of conventional physics inspired the neoclassical economics, new orientations in the natural sciences have triggered a non-orthodox strand of thought within economics. The emphasis is shifted from equilibrium to non-equilibrium as a 'source of spontaneous self-organization' (Blaug, 1994). One characteristic feature of this new emphasis is an understanding the presence of non-linearities that can amplify 'small causes' into 'larger effects' (Prigogine, 1985, p.108). According to Prigogine (1986, p.493) 'the future is not given', but is created in an unfolding evolutionary process

With regard to this new approach, Allen (1988, p.99) points out: 'the cloudy, confused complexity of the real world is the essential subject of an evolutionary approach – in contrast to a perspective that looks for types and classes, and that views microscopic diversity and variation as negligible aberrations, to be averaged out through classification and aggregation.'

The 'new self-organization paradigm', as Allen (1988:108) puts it: "the fluctuations, mutations and apparently random movements which are naturally present in real complex systems constitute a sort of 'imaginative' and creative process, which was entirely absent in a 'Newtonian paradigm'. "A core insight of the new paradigm is that nature is creative, that novelty and genuinely unpredictable outcomes are generated as the evolutionary process unfolds over time." (Allen, 1988:317)

The non-teleological '*radical subjectivism*', associated with Shackle (1979), Lachmann, Wiseman and Littlechild (1970) raise basic objections to neoclassical theory and criticise (1) the assumption of perfect knowledge, particularly the knowability of the future, (2) the assumptions of rational expectations or Bayesian adaptive

rationality and (3) the assumption of a world view that treats the future as implied by the present.

For this school, there can be no 'given' future independent of the choices that need to be made. In Wiseman's terms: "The essence of the radical subjectivist position is that the future is not simply 'unknown,' but is 'nonexistent' or 'indeterminate' at the point of decision" (1989, p.230). But it does not imply that the future is 'beyond *conjecture*' (ibid, p.104). Individuals have *expectations* about the future on which they base their action.

"To the subjectivist, expectations may be more or less reasonable, but they can not be more than conjectures about an undetermined and therefore, unknowable future. But to the neoclassical economist, expectation is about a future that is, in principle, *knowable*.... ignorance of the future is essentially seen as a source of inefficiency, as a problem that can, in principle, be remedied by learning. By contrast, from a subjectivist position, such ignorance is simply 'an inescapable characteristic of the human condition'" (ibid, p.318). As Wiseman (1989, p.143) puts it: "the possibility of learning does not imply that through learning the future will become knowable, but only that experience will change behaviour."

Shackle suggests that every person choosing among different courses of action can be seen 'to be making history, on however small a scale, in some sense other than mere passive obedience to the play of all-pervasive causes.' Every choice can be seen as the beginning of a sequel that 'will be partly the work of many people's choices-to-come whose character... the chooser of present action cannot know.' 'Our knowledge of the future is from this perspective, not 'a deficiency, a falling-short, a failure of search and study. Rather, it reflects 'the plurality of rival possible' (Shackle, 1983, p.28-37).

In the modern Austrian version of subjectivism – to include I. Kirzner's work on entrepreneurship – there is an emphasis on the entrepreneurial role in economic interaction Kirzner claims that his theory keeps a middle ground between 'two extreme views': the neoclassical equilibrium view and radical subjectivism. As a basic affinity to the latter, Kirzner criticizes the neoclassical position for assigning 'no role ... to the creative entrepreneur' (1985, p.13) in 'an open-ended, uncertain world'

(52). However, his theoretical perspective locates the essence of entrepreneurship in 'the discovery of error' (1985, p.50), a position unacceptable to the radical subjectivist.

For example, Buchanan and Vanberg (1994, p.321) argue: " if the essence of entrepreneurial discovery is to 'provide protection' or 'rescue' from 'earlier' or 'past error', what is then the benchmark or *reference-base* against which the failure to do something can be judged to be an 'error'?" ... "There is, in our view, a fundamental inconsistency in Kirzner's attempt to integrate the innovativeness of entrepreneurial activity into an equilibrium framework – by modelling it as *discovery* of 'erroneously over-looked opportunities."

Kirzner seeks to take a 'middle ground' between a teleological and a non-teleological understanding of the market process, moving from *cross-sectional* to *intertemporal* interpretation: according to cross-sectional interpretation, the entrepreneur acts as *arbitrageur*; according to the intertemporal view, the entrepreneur takes advantage of yet unnoticed divergences between today's market and tomorrow's markets, thus helping 'to coordinate markets also across time' (Kirzner, 1985, p.61-62).

However Buchanan & Vanberg criticize Kirzner's 'middle ground' by arguing that (1994, p.323): "entrepreneur activity, in particular, is not to be modelled as discovery of that which is 'out there'. Such activity, by contrast, creates a reality that will be different subsequent on differing choices. Hence, the reality of the future must be shaped by choices yet to be made, and this reality has no existence independent of these choices".

The key feature of the radical subjectivist position, as Buchanan & Vanberg (1994, p.323-4) put it, is: "its conception of 'a world in which time plays a vital role' (Littlechild, 1979, p.38), of history as an open-ended evolving process, and of a future that is not predetermined, merely waiting to be revealed, but is 'continuously *originated* by the pattern and sequence of human choice' (Littlechild, 1979, p.38). Such a conception has clear implications for the theory of the market... "What we want to suggest... is that the creativity of human choice poses a problem that any effective socio-economic theory cannot evade" (ibid).

According to this non-teleological school, the market economy, as *an aggregation*, neither maximizes nor minimizes anything. It is not an allocative process, neither a discovery process, rather a *creative process*. It simply allows participants to pursue that which they value, subject to the preference and endowments of others, and within the constraints of general 'rules of the game' that allow, and provide incentives for, individuals to try out new ways of doing things. It is this notion that provides the basis for this study.

3.5 An Institutional approach to property rights

Being consistent with these methodological insights, this thesis adopts an institutional approach to the study of property rights. In the following sections, this study firstly reviews research methodology embedded in different models of institutional change, and then illustrates the rationale regarding adoption of the institutional approaches in this thesis.

3.5.1 The 'Property rights school': the basic and most widely accepted notion of institutional change

The Washington School, based on the researches of Coase, Alchian and Cheung (1974, 1982, and 1983) develops a transaction cost theory of institutional change and focuses on one key element of institutions, the structure of property rights, which sets the constraints and rules for competition and exchange. Hence, according to this school, a change in institutions involves a change in the structure of property rights.

The logic of the property-rights school can be stated in the following format:

$$\text{economic yield} = f(\text{property rights})$$

suggesting that the structure of property rights is an explanatory variable in institutional change. It is this assumption that provides the intellectual basis for the 'big-bang' policies adopted by most transitional economies in Eastern Europe in the 1980s and 1990s.

The critique of this approach argues that it obscures the difference between institutional arrangements that give rise to different situations that define property rights. Bromley (1990, p.16) says: “different forms of property rights (institutions) will require different levels of supporting infrastructure to define rights and duties, to demarcate boundaries, and to enforce that structure of rights; and that therefore the economically appropriate structure, whether private property, state property, or common property, is a function of the economic surplus available to support those differential costs.” Bromley’s approach captures the idea that the appropriate structure of property rights is a dependent variable in within a *creative* process of marketization, as opposed to an explanatory variable as suggested by the property-rights school.

Furthermore, Dahlman (1980, p.15) pinpoints the problematic *asymmetry* in the application of the Washington doctrine by explaining: “this school’s analysis overlooks the very real costs of establishing private rights and of protecting those rights once established. When private rights are absent and resource degradation is observed, adherence to the property-rights model would suggest that it is the institutional arrangement (non-private property) that is to blame. On the contrary, the abundant evidence of the misuse of private rights seems not to matter to those who advocate complete privatisation as the essence of social wisdom --- the property-rights model thus yields a curious *asymmetry*.”

The problems associated with the transaction cost theory of institutional change is rooted in its methodological assumptions in the sense that it takes a view of society as consisting of *rational* human beings competing independently of one another in the market and applies these assumptions in the *real* world. As this thesis has explained in chapter 2, such a view is misleading. Moreover, it fails to consider the role of the individual in the formation of institutions.

3.5.2: Variants of the property right approach to institutional change

3.5.2.1 “Induced institutional innovation”

In contrast to the Washington School’s property rights approach, Ruttan and Hayami (1984) develop a model of institutional change in their paper “Toward a theory of induced institutional innovation”. The model is based upon the concept of institutions defined as: “the rules of a society or of organisations that facilitate coordination among people by helping them form expectations which each person can reasonably hold in dealings with others. They reflect the conventions that have evolved in different societies regarding the behaviour of individuals and groups relative to their own behaviour and the behaviour of others. In the area of economic relations they have a crucial role in establishing expectations about the rights to use resources in economic activities and about the partitioning of income streams resulting from economic activity – institutions provide *assurance* respecting the actions of others, and give order and stability to expectations in the complex and uncertain world of economic relations.” (Ruttan and Hayami, 1984, p.204)

The Ruttan and Hayami model is based on cost-benefit analysis – a trade-off between ‘demand for institutional innovation’ and ‘supply of institutional innovation’. According to R&H, technology or new factor endowments is the primary source of institutional change, the engine of institutional innovation. They argue: “basic institutions such as property rights and markets are more typically altered through accumulation of ‘secondary’ or incremental institutional changes such as modifications in contractual relations or shifts in the boundaries between market and non-market activities...in our view, the supply of institutional innovations is strongly influenced by the cost of achieving social consensus (or of suppressing opposition). How costly a form of institutional change is to be accepted in a society depends on the power structure among vested interest groups. It also depends critically on cultural tradition and ideology, such as nationalism, that make certain institutional arrangements more easily accepted than others” (1984, p.205). They finally conclude that institutional innovation is endogenous to the economic system and that new institutions will evolve when the benefits of new structures exceed the costs of the change; if institutions do not change then the costs of change exceed the benefits.

The limitation of this model lies with the driving force of change. Treating technology or new factor endowments as the primary source of institutional change is not only circular, but incomplete. It is circular because all technology encompasses institutional dimensions in terms of who owns the new technology, who controls its use and benefit streams and who must bear the costs of its implementation.

3.5.2.2 A mismatch theory of institutional change

Sven-Erik Sjostrand (1995) develops an alternative *mismatch theory of institutional change*. First, he separates the individual level (micro) and socially constructed level (macro) of human interactions and exchanges and argues that institutions are generally macro phenomena and are continuously reproduced by individuals in their daily activities and interactions on the micro level. Then, he argues that the ever-present mismatch between micro and macro levels is the major force in institutional change.

He concludes: “the distance between the experiences, thoughts and actions of individuals on the micro level on one hand, and by the content and regulations embedded in the socially constructed institutions on the macro level, reflecting more general perspectives in society, on the other... The gaps – or mismatches – between the micro and macro levels are the driving forces, the innovation generators behind institutional changes. Thus, institutions are phenomena that coordinate, regulate, and stabilize human activities at a macro level, while simultaneously functioning as part of the raw material of change among individuals on the micro level” (Sjostrand 1995,p.20)

Despite this incompleteness of the arguments of the above two models of institutional change, this research attempts to integrate the rational elements contained in them as methodological research benchmarks in the case studies and analyses. R&H’s ‘induced’ model emphasizes the importance of the *status quo* – the extant power structure of vested interest groups – in institutional change of property rights. Although the mismatch model does not address the questions of how the ‘gap’ be identified and filled, it demonstrates the macro constraints on individual behaviour in institutional change.

3.5.3 Douglass North's approach

3.5.3.1 North's model of institutional change

In this thesis Douglass North's model of institutions and institutional change is adopted. He argues that institutions are historically specific and for this reason it is necessary to be sensitive to historical context. As North (1990) concludes: "institutions form the incentive structure of a society and political and economic institutions, in consequence, are the underlying determinant of economic performance. The organizations that come into existence will reflect the opportunity provided by the institutional matrix. It is the interaction between institutions and organizations that shapes the institutional evolution of an economy".

North later introduces the entrepreneur as *maximizer* responding to incentives embodied in the institutional framework (North 1990, p.83; 1992, p.10). He argues that most sources of institutional change are 'endogenous factors, reflecting the ongoing maximizing efforts of entrepreneurs...that will alter relative prices and in consequence induce institutional change' (North 1990, p.84). North sees organisations as taking advantage of opportunities and 'the difference between institutions and organisations and the interaction between them shapes the direction of institutional change' (North, 1990, p.7). According to this argument, entrepreneurs are considered as adaptive maximizers, responding to external conditions and gradually changing institutions. Therefore, the process of institutional change is the continuous interaction between entrepreneurial exploration and exploitation of opportunities (Dosi and Malerba 1996, p.6).

Lachmann argues (1970, p.36): "different men in identical situations may act differently because of their different expectations of the future." Menger (1981) identifies two types of institutions – designed and undersigned. According to him, the designed type arises as a result of a common will directed toward its creation; while the latter is "the unintended result of innumerable efforts of economic subjects pursuing individual interests."

Schumpeter's entrepreneurship (1934, p.81-86, 1947, p.150) exerts a disturbing force within an economy termed 'creative destruction'. It encompasses three essential

characteristics; firstly, it is only understood *ex post facto*; secondly, it changes social and economic circumstances completely, creating situations which would not have emerged in its absence; thirdly, the frequency of its occurrence has something to do with individual decisions, actions and patterns of behaviours. Schumpeter (1934, p.228) proposes two types of economic response, arguing that adaptive response follows creative response.

Yu (2000) attempts to build up an entrepreneurial theory of institutional change based upon *Kirzner's theory of entrepreneurial discovery*, *Schumpeter's two types of economic responses* and *the Austrian theory of institutions*. He associates two types of discovery – extraordinary / ordinary – with creative / adaptive responses in economic change respectively. He explains: “Entrepreneurial extraordinary discovery destroys the stability of institutions and brings uncertainty in the market (creative response). As a consequence, institutions are incapable of coordinating economic activities because market participants’ stocks of knowledge are no longer adequate to solve new problems. Thus, profit gaps or mismatches of market participants’ plans occur. Given new technologies, new relative prices and tastes, imitative entrepreneurs soon identify and capitalize on the opportunities created by Schumpeterian extraordinary discoveries. Imitators improve production methods, modify rules, and alter property rights in order to improve coordination (adaptive response). Through learning, experimentation, trial and error, more rewarding methods are then selected. Successful actions are imitated and adopted repeatedly in the market and gradually crystallize into new institutions which once again serve as social coordinators.” Yu concludes that given uncertainty and ignorance, institutions, as largely *unanticipated consequence of purposive human actions*, emerge to coordinate economic activities.

According to this school, the process of institutional change involves interactions between entrepreneurial learning, trial and error elimination and the social construction of institutions. However, knowledge and history shape entrepreneurs’ interpretation of their environments and hence their discoveries and institutions. Entrepreneurs tend to expose themselves to ideas that are in accordance with their interests, needs, or existing attitudes. They consciously or unconsciously avoid messages that are in conflict with their predispositions, termed ‘selective exposure’ by Rogers (1983, p.166) and ‘system relevance’ by Schutz (1970, p.111-112).

3.5.3.2 Approaches adopted in this thesis

North's insights provide the methodological guidance for this research, as he (North 1992, p.12) concludes: " The engine of institutional change – new economic opportunities- is itself only defined by the very institutions under transition....It is the institutional structure of an economy that defines what is considered to be efficient...models of institutional change driven by a rationale efficiency are tautological at best because the very meaning of efficiency derives from the institutional set-up that defines the arena within which gains from exchange can occur. The interests of these existing organisations, which produce path dependence, and the mental models of the entrepreneurs, which produce ideologies, rationalize the existing institutional matrix and therefore bias the actors in favour of policies conceived to be in the interests of existing organisations."

In this research, the empirical study attempts to address the question of how the new institutions of property rights are created from the *status quo*, which itself defines the constraints and incentives, in the context of transitional China? Moreover, are such new institutions unanticipated consequences of purposive human actions?

Chapter 4. Case Study Methods

The research methods should be compatible with the methodology adopted in the research. Following up the methodology in chapter 3, this chapter addresses the question of case study methods. The first part of this chapter explains why this research employs case study method and outlines the strategy and framework of case studies. In part two, firstly, the fieldwork methods that have been applied in this research are introduced. And secondly, the thesis summarises how fieldworks have been conducted and problems encountered in the fieldwork.

4.1 Why Case Studies?

4.1.1 Adopting the method of case studies to serve the methodology of this study

4.1.1.1 The institutional approach of the study

Neoclassical theory is the dominant paradigm within the economic profession. Neoclassical theories have provided the rationale and for research on ownership and property rights, which have been at the core of the debates on the transitional economy in China in the past two decades.

Mainstream neo-classical economists adopt *positive* research methods and believe that the *objective and scientific* economic toolkits can be used to clarify the menu of options from which society must eventually make its *normative* choice. Regarding the question of property rights in China in transition, one major research method is to build the evaluative and comparative models to analyse the relative effectiveness of various ownership and property rights arrangements and recommend the choice of policy based upon the *objective* research outcomes. As indicated in the literature review, the majority of evaluative and comparative models from a neo-classical perspective present the conclusion that market efficiency is enhanced once the domain of private property rights and market forces are expanded.

With regard to such studies on the impact of ownership and property rights on the performance of the firm in transitional China, institutional theories would suggest that they are unlikely to clearly define or classify the appropriate set of benchmarks for evaluation and consideration. The dynamically changing property rights structure has not yet reached its 'ends' and has thus not been predetermined for evaluative & comparative research. Instead of regarding ownership as the 'ends' of political and economic policy (Stiglitz uses concepts of 'ends' and 'means' to describe the different visions on the change of ownership), the aim of this study is to consider the ownership and property rights structure as one of the 'means' to reconstitute the institutional domain in change.

The majority of evaluative & comparative studies on the change of ownership and property rights are 'static' tests, which analyse the relation between ownership and efficiency *holding other factors constant*. Critics would often attack such 'static' results by examining the impacts of broader factors that are argued to be constant. For instance, researchers with beliefs grounded in *laissez-faire* individualism and free market economics would not agree with proponents of state ownership, who, studying the post-war boom of state-owned enterprises in the 1950s and 1970s concluded that public ownership had improved the efficiency of firms' performance. They might argue that it was not public ownership *per se* but broader factors of political stability, the new international economic order and technological breakthroughs, which contributed to the post-war boom.

However, 'hypothetic-deductive' models, based on the notion that hypothetical universal laws can be tested by making predictions about particular events, are not themselves reducible to observations about contextual events. This embedded problem constrains the application of 'hypothetic-deductive' models in research where the contextual factors are so important and cannot be neglected as irrelevant factors to be held constant.

It is not the aim of this study to provide empirical evidence on the question of the relative efficiency of private versus public property rights. By adopting an institutional approach, its aim is not to predict but to understand the changing nature of property rights in the context of China in transition. With regard to this new

approach, Allen (1988, p.99) points out: ‘the cloudy, confused complexity of the real world is the essential subject of an evolutionary approach – in contrast to a perspective that looks for types and classes and that views microscopic diversity and variation as negligible aberrations, to be averaged out through classification and aggregation.’ Adopting an evolutionary institutional perspective, this study will address the question of property rights taking microscopic diversity and variation in the ‘real world’ into consideration. One of the aims of this study is to generate fresh evidence that has been neglected in previous studies and provide references for further studies in the field.

4.1.1.2 The case studies strategy

In this study, the concept of property rights is perceived as a set of *socio-economic relations* that is historically specific. North (1994) argues: “ Time as it relates to economic and societal change is the dimension in which the learning process of human beings shapes the way institutions evolve.... At any moment in time, actions are constrained by customs, norms, religious beliefs and many other inherited institutions.” The organizations that come into existence will reflect the opportunity provided by the institutional matrix. It is the interaction between institutions and organizations that shapes the institutional evolution of an economy” (North, 1990).

The most notable characteristic of China’s reform - its ‘bottom-up’ nature conducted by ‘trial and error’- daily validates the *Hayek insight* (1967) that the fundamental human problem is the co-ordination of dispersed knowledge in a useable form, that is, allowing individuals to act on local knowledge. “*Collective learning*” is “the transmission in time of our accumulated stock of knowledge”(Hayek, 1952). It is culture that provides the key to *path dependence*, a process which belief structures get transformed into societal and economic structures by institutions – both as formal rules and informal norms of behaviour. Economic change is, therefore, a ubiquitous, ongoing, incremental process that is a consequence of the choice individual actors and entrepreneurs of organisations make every day (North, 1993).

As argued earlier, deductive study (hypothesis testing) has been the most popular research method in the study of property rights in China. In the literature review,

discussion identified both the intrinsic limits and the inappropriate application of neo-classical textbook theories given China's 'contextual circumstances'. Research in the Chinese context therefore has the potential not only to falsify the extant accepted theories but, more importantly, to develop new theories to contribute to global knowledge. This study aims at generating original theories from the research into the behaviour of firms and people in China. Therefore, there is a need for more inductive study (hypothesis generation) using various qualitative methods to generate locally grounded theories.

This study adopts an institutional methodological approach in an empirical study of high-tech spin-off enterprises in the context of China in transition. The research question aims at *exploring* the formation and utility of particular property rights forms in these enterprises' institutional and organisational setting. Wilber and Harrison sum up the institutionalist's search for validation as follows: "Evidence in support of an hypothesis or interpretation is evaluated by means of contextual validation. This technique is a process of cross-checking different kinds of sources of evidence (historical studies, questionnaires, case studies, and so forth), and it serves as an indirect means of evaluating the plausibility of one's initial interpretations."

The *ethnographic study* purports to provide a rich, or 'thick' description, which interprets the experiences of people in a group from their own perspective (Fetterman, 1989; Geertz, 1975). *Case study* is perceived as '*a strategy for doing research, which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence*' (Robson, 1993). The case study strategy that is most likely to be appropriate for 'how' and 'why' questions (Yin, 1994, p.21), 'in the real world', can provide a rigorous approach to all aspects of the enquiry, a strategy in which you can 'tell it as it is', rather than disguise it in the formalised straitjacket of the experimental report. The case study method therefore provides an appropriate toolkit to serve the research objectives of this study.

4.1.2 Methods adopted for case studies

The following case study methods are adopted to serve the research objective of this study:

- A. Multiple case studies*
- B. Holistic case studies*
- C. Exploratory case study / explanation building*
- D. Time-series analysis / Cross- cases analysis*

4.1.2.1 Multiple case studies: the scope and structure of the case studies

This study aims to provide understanding and interpretation of the changing nature of property rights within the high-tech sector in the ‘real world’ of China in transition. It seems foolish to throw away the inherent flexibility of case study research by slavish adherence to what was decided before the study. In practice most case study work is likely to fall somewhere between the extreme of tight pre-structured case study designs and the extreme of loose emergent ones which can be justified in a range of different circumstances. *Emergent design* is one characteristics of case study; research design unfolds from the interaction with the study (Marshall & Rossman, 1989). However, the flexibility of case study does not mean to change the purpose or objectives of the study to suit the cases that are found.

It has been a flexible process in the sense of selecting and defining ‘cases’ for the study. With the advance of the study, through constant interplay between the researcher and the research act, the scope and structure of cases has gradually unfolded and eventually shaped. However, although the scope and structure of the cases studies are different from the initial design, the research objectives that the cases studies were designed to serve have stayed firm.

The cases - HUAGONG Image Ltd., and GAOLI Electronics Co., Ltd, high-tech spin-offs from one university - identified at the beginning of the research remain the ‘key cases’ of the study. However, as the research themes unfolded, there was growing need to explore contextual evidence to support the generation of a descriptive theory from local experiences and to nourish the conduct validity and rigour of the research.

In order to provide a ‘landscape’ for the development of university spin-offs in China, I present the study of the evolutionary process of university high-tech spin-offs in the context of the development of high-tech industrial sectors in China in Chapter 5. As indicated there, among different types of business ventures in the high-tech sector, university spin-offs in China have had a distinctive path of development. China’s high-tech industries have, from their inception, been dominated by spin-offs, which are regarded as a significant institutional innovation in the transitional process of R&D system in China. The evolution of university spin-offs in China in the past two decades is not an individual case or a regional phenomenon. Spinning-off has been the major path of transferring R&D capabilities into industrial and commercial products. As a mode of institutional innovation, it has served the needs of introducing the ‘invisible hand’ – the market mechanism – into the extant R&D system in which science and technology had been nurtured by the ‘visible hand’ - the government funding and subsidy policies.

The landscape study comprises 23 high-tech university spin-offs, which are currently publicly listed companies on China’s stock exchanges. The two ‘key cases’ selected at the beginning of the research are among the sample of 23 publicly listed companies. The 23 cases neither being ‘sampling units’ nor are they chosen to generalize the ‘statistical significance’ of the study. Based on secondary data, the landscape study aims at providing a chain of contextual evidence to enrich the conduct validity of initial ‘key cases’. The empirical results can be considered more potent if more cases yield significant potentially relevant variables. Therefore, based on secondary data, it is compatible with the original objectives of this research to adopt ‘analytic generalization’ as the method of generalizing the results of these 23 cases.

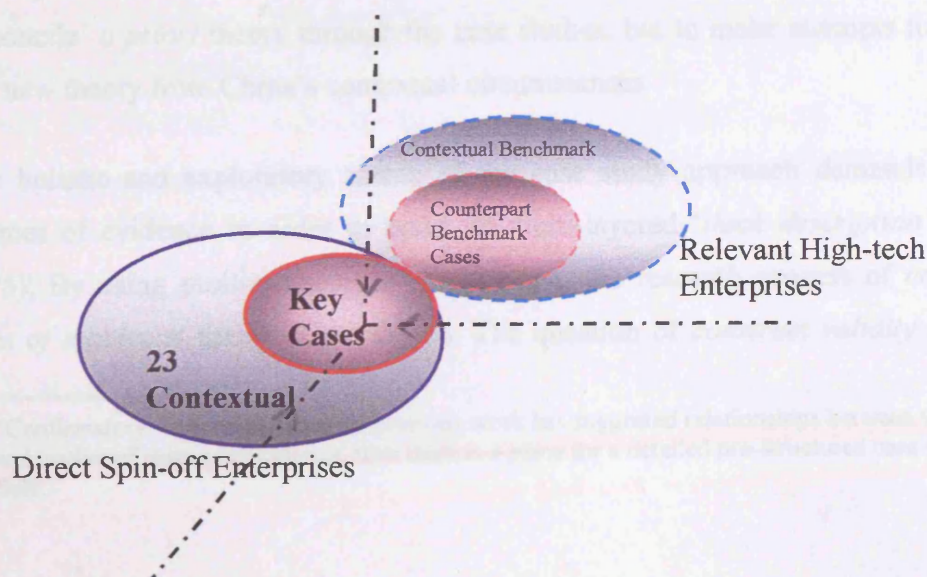
Given the complexity of the realm of external validity, in addition to ‘landscape’ cases, ‘benchmark’ cases are selected to articulate external conditions that have impacts on case study results. The consideration of undertaking ‘benchmark’ cases was inspired through the discussions with key actors in the fieldwork. Key actors mentioned the ‘learning process’ and ‘imitating effects’ in the development of their spin-off enterprises. According to them, those who broke the extant ‘rules of the game’ and acted as ‘the first persons to taste the crab’ made significant breakthroughs

and achievements which imitators often took pioneers' experience into consideration when they built up their development strategies. Counterpart benchmark cases are adopted in this study to justify the external validity of the key case study results.

Spin-off enterprises based in China's 'test zone' of R&D reform – Beijing *ZhongGuanCun* (ZGC) High-tech Development Zone – are selected as the contextual 'benchmark cases'. Given the facts that (1) the first university spin-off was established in the ZGC test zone in 1984, (2) a significantly large number of leading spin-off enterprises are located in the ZGC test zone at various stages of development and (3) crucial institutional innovations in the ZGC test zone have always progressed ahead of other zones, I believe that the study of spin-off enterprises in the ZGC test zone presents an appropriate contextual benchmark for 'thick description' associated with the key cases.

As the only state test zone for R&D system reform, the Ministry of Science and Technology of the Beijing municipal government organized dynamic research groups to undertake in-depth research into the growth and development of knowledge-based businesses with high growth potential since 1989. Some of their research outcomes have led to major policy breakthroughs that have facilitated further reform and development in the high-tech sector. Their annual research reports since 1992 onwards on high-tech businesses based in ZGC have been published and relevant research archives are open to the public.

Figure 4.1: A three-dimensional Case study structure



4.1.2.2 Holistic and exploratory case studies: theory development

Theory development

Consistent with an investigative approach, my analytical methods largely comprise *inductive data analysis* (rather than *deduction*), *negotiated outcomes* and *idiographic interpretation* with the intention of generating *Grounded Theory* (Glaser and Strauss, 1967). In coining this term, Glaser and Strauss were attempting to free social researchers from the straitjacket of a few ‘grand’ theories. In their work, grounded theory refers to theory generated in the close inspection and analysis of qualitative data, produced as a result of research undertaken without any strong *a priori* theory (Sanders, 2000). To the extent that my research findings are able to generate a new theoretical framework with which to understand High-tech spin-offs in contemporary China, I will be generating grounded theory, which can hopefully ‘persuade an audience’ (Henwood & Pidgeon 1993, p.24).

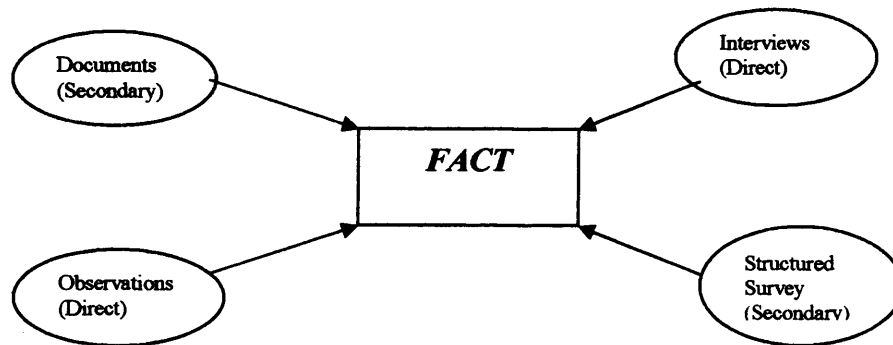
Yin (1994) argues that the case study method can be differentiated *per se* from related methods of ‘ethnography’ (Lincoln & Guba, 1986; Van Mannen, 1988) and ‘grounded theory’, which deliberately avoid specifying any theoretical propositions at the outset of an inquiry. I argue that although the relevant field contacts depend upon an understanding of what is being studied and previous works provide a rich theoretical framework for designing a specific case study, the case study need not be limited to *confirmation*¹ of suggested propositions. In my case study research, an exploratory process has been adopted through which the methods of ‘ethnography’ and ‘grounded theory’ are incorporated. The case is not merely to ‘falsify’ or ‘reconcile’ *a priori* theory through the case studies, but to make attempts to ‘conjure up’ new theory from China’s contextual circumstances.

The holistic and exploratory nature of the case study approach demands multiple sources of evidence in order to build up multi-layered ‘*thick description*’ (Geertz, 1975). By using multiple sources of evidence, the research process of *converging lines of inquiry* is therefore developed. The question of *construct validity* regarding

¹ A ‘Confirmatory’ case study is where previous work has suggested relationships between variables or an explanation of some phenomenon, then there is a place for a detailed pre-structured case study out in the field.

the case study is therefore addressed. In this study, historical data, first hand investigation and secondary data have been collected from various resources to support the research.

Collecting the data: multiple sources of evidence



4.1.2.3 Building explanation: analytic generalisation

Analytic generalisation is undertaken through the interplay of the cross-case descriptions covering multiple dimensions based on time-series data. The time-series analysis of chronological stages of high-tech sector reform and the development of the spin-off enterprises occurring at each period provides the historical context in which a descriptive theory is built up. The cross-case analysis presents a thick description at each stage. By adopting the technique of cross-checking different kinds of sources of evidence – historical data, first hand investigation and secondary data - contextual validation of my interpretation is provided.

Time-series analysis: chronological structure

Period I: mid 1980s –1992, start-up stage referred to as ‘the first creation’ (initiation of the spin-off enterprise).

Period II: 1992-1997, survival & fast growth stage referred to as ‘the second creation’ (re-construction).

Period III: 1997 onwards, expansion stage

As stated in the introduction, 1992 and 1997 were watersheds in the transitional process of China in the sense that breakthroughs in reform were achieved at these dates. Thus these are used as turning points in this thesis to differentiate the development stages of China’s high-tech sector.

Cross- case analysis

In each period, the study covers primarily three dimensions:

- 1). Addressing the central government policies at the time, providing broader background information about the development of spin-offs
- 2). Exploring the benchmark cases by looking at spin-offs in the *Zhongguancun Science Park (ZSP)*, Beijing - the 'test zone' for R&D reform in China. This part of study is, by and large, text investigation based upon secondary data.
- 3). Focusing on the changing nature of 'key cases' in the period by first hand data obtained through fieldwork investigation.

There are two kinds of basic research questions involved at each period: (1) questions to be addressed in the specified period only. (2) research questions to be addressed across all periods. Furthermore, there will be an interplay analysis through crosschecking of the two kinds of questions.

In period I, the study focuses on the initiation of spin-off enterprises. The critical questions at this stage concern the 'bargaining' process of property rights. The study aims at answering the following questions:

How was the spin-off initially formed?

What was the organisation structure of the spin-off?

Who was the initiator of the business?

What motivated the initiator to start the business?

Who decided on the transfer of assets?

How were the transferred assets being identified?

How were the assets of public research institutes being transferred into spin-offs?

How was the responsibility and liability with respect to transferred assets shared between institutes and spin-offs?

How did initiators cope with the problems of property rights? *Crucially,*

In what ways were the state agencies involved at start-up stage in the process of transferring public property rights to individuals?

Who owned the spin-off enterprises and what was the ownership structure??

Who *de facto* held the right of control of the company and how?

In **Period II & III**, the study addresses the questions that evolved from the questions encountered in Period I.

Has the organisation structure of the spin-off changed? How and Why?

Did the initiator remain as the head of the spin-off? If not, Why not? Who replaced the initiator?

How were the transferred assets reinforced?

How were the benefits generated from the transferred properties being distributed?

Who decided the distribution?

How was the responsibility and liability with respect to accumulated assets shared between mother institutes and spin-offs? *Crucially*,

In what ways were the state agencies involved at this stage in the process of transferring public property rights to individuals?

Who owned the spin-off enterprises and what was the ownership structure?

Who *de facto* held the right of control of the company and how?

By summing up the above data, the theory generated addresses primarily two fundamental questions:

(1). How has the ‘bargaining’ process of property rights facilitated the establishment of spin-off enterprises? Putting it in the context of Deng Xiaoping’s pragmatic saying, the questions are: which ‘stones’ have been found to cross the ‘river’ and how have the ‘stones’ been found?

(2). To the extent this thesis argues that the answer is fuzzy property rights and public entrepreneurship: Why were these two crucial stones facilitating the development of spin-off enterprise?

4.2 Fieldwork methods

4.2.1 General fieldwork methods

Case study research relies on the trustworthiness of the *human* instrument (the researcher) rather than on the data collection technique *per se* (Myrdal, 1965). Hence, *use of tacit knowledge*, and the characteristics and skills of the researcher are of crucial importance. Miles and Huberman (1984, see also White, 1993) consider that it

is necessary to have ‘some familiarity with the phenomenon and the setting under study; strong conceptual interests; good investigative skills, including doggedness, the ability to draw people out, and the ability to ward off premature closure’.

Preparatory fieldwork was done in September 2001 in Shenzhen and Wuhan, China. The preparatory fieldwork was carried out with regard to 3 high-tech spin-off enterprises located in two cities: Shenzhen and Wuhan. They were: HUAGONG Image Ltd., HUAWEI Technologies Co., Ltd., and GAOLI Electronics Co., Ltd. (HUAGONG Image Ltd And GAOLI Electronics Co., Ltd were incorporated into the publicly listed HUAGONG Sci. Ltd., which floated on the Shenzhen stock exchange in May 2000.) I visited these companies in September 2001, collected basic data for the research and contacts were established for further work. In addition to the research and contacts with these companies, I also established reliable relationships with researchers from Shenzhen University, government officials from Wuhan Eastlake High-tech Development Zones and leading entrepreneurs from the local business communities.

I visited the selected companies for a short period in April 2002, and re-established my contacts. From June to September 2002, I undertook the main fieldwork, mainly in Wuhan, immersing myself, as far as possible, within the selected companies and their operational environments and collecting all relevant data. I conducted further fieldwork in August 2003. From September 2001 through to the summer 2003, therefore, I traveled to China in furtherance of my fieldwork and visited the selected companies over varying lengths four times.

4.2.2 Building up and maintaining ‘guanxi’

Given the fact that there is no textbook to follow regarding the conduct of fieldwork in China, I developed my own methods. Throughout my fieldwork, there were two vital stages: stage 1 - preparatory stage – the priority being to build up ‘*guanxi*’ (networking); stage 2 – conduct stage - emphasising managing ‘*mianzi*’ (face and favour) in order to maintain and reinforce ‘*guanxi*’, which is crucially needed to facilitate fieldwork.

Given the complexity and sensitivity of certain research in China, it is necessary for the researcher to identify the person or group with authority and obtain his/her approval or endorsement for the study. Researchers also need to be aware of the status of the initial contact person and depending upon his or her status, this can either lead to the opening or closing of doors (John Ap, 2002).

In order to build up '*guanxi*', it is crucial to use a local 'guide' at the preparatory stage. In my fieldwork, the 'guides' themselves were also respondents, informants, interviewees and key actors. They were my own acquaintances, colleagues and friends or acquaintances, colleagues and friends of my acquaintances and friends. The guides act as the linchpin throughout the fieldwork.

I made attempts directly to contact key actors in the fieldwork before preparatory fieldwork. At the initial research design stage, I considered the research method of a questionnaire-based survey and sent out questionnaires to a sample group of 31 managers from 14 companies. Although the sample group was not randomly selected, in that they were managers to whom I had delivered a management consultancy course before, the reply was poor and not encouraging at all. Therefore, I had to adjust my research strategy and adopt a pragmatic research design that was by and large 'do-able'. This failure at an early stage reminded me of the need to be prudent with research methods that may require extensive resources and time beyond the means of a single student or independent research investigator.

I evaluated and defined my 'research position' as an independent researcher constrained by limited research funding and restricted timetable. I went back to China for one month in Sep. 2001. Instead of rushing into the research, I spent this course of time on networking and building up reliable contacts and consultants. It was the process of being aware of the status situation of the researched group and putting myself into an appropriate position for future research. It was crucial to present myself as a friendly non-troublemaker to various members in the researched group. Otherwise, the fieldwork would not be do-able. As Tsang (1998) suggests, in direct contrast to the common Western way of doing things, a non-confrontational or consensus approach is important when dealing with Asians. It is important to be

aware of the need for delicacy and thus to avoid asking blunt questions (including questions of permission initially) and thereby causing offence inadvertently.

Thus, given the sensitivity of the research question and the difficulties of doing research in the Chinese context generally (see below), my initial fieldwork in China in August 2001 largely involved building up good relations in the key case studies. Without having these initial contacts, without having developed sufficiently good '*guanxi*' with key contacts in the companies, further progress would have been impossible. As Sanders (2000, p.91) puts it "the establishment of good relationships, of good *guanxi*, is absolutely essential if the researcher is able to elicit anything beyond the stock response".

4.2.3 Problems encountered in the fieldwork

There are certain other problems encountered with systematic research via interviews in the Chinese context. In furtherance of my essentially qualitative methodology, there is a need for substantial flexibility in order to achieve reliable research outcomes. The nature of this research was both personally and politically sensitive and it was therefore not possible to tape record interviews (see the research methods employed by Jean Oi, *Rural China takes Off*, p.205-9).

The political sensitivity results from the fact that one of the dominant themes concerning the last 50 years remarkable yet difficult transition of the PRC has been the sovereign role of ideology (Pye, 1999) and the change of ownership and reform of property rights has been closely associated with political and ideological debates. Although ideological constraints have been substantially lifted in recent years and while the market system has developed and Chinese enterprises enjoy freedom they would not have expected a decade ago, the influence of political issues on the survival and development of enterprises remains.

Initiating business and developing the local economy by conducting a 'trial' through the niche of polity² has been well recognised as a competitive advantage for the more

²Do business in a way that the government neither legally allows nor officially disallows.

developed regions in China. However, the ideological compromises and initial ambiguities have often embedded further conflicts among different interest groups. The experience, which is highly valued and appreciated as ‘entrepreneurial spirit’ by one group of people is interpreted by others as diverting assets and earnings from the public sector into private hands. The differentiation between predatory behaviour and ‘entrepreneurial spirits’ remains a ‘grey area’, involving legal and moral dilemmas. Therefore, there is a need for the researcher to be able to identify and be prudent in addressing such sensitive questions as property rights.

My research methodology was essentially guided by Gordon White (1993, p.13), who also exposed the difficulties of research in China by arguing:

“On the question of methodology, a focus on the *politics* of economic reform is no easy matter, since Chinese political and policy processes are frustratingly opaque. Moreover, the Chinese authorities attempt to present a simplified, one-dimensional view of Chinese political realities, seeking to disguise conflict and draw a veil of secrecy over the pulling and hauling which goes on behind the scenes. In analysing the politics of economic reform, therefore, the scholar must borrow the skills of the detective and investigative journalist, drawing together a wide variety of sources and reading between the lines as often as along the lines. It is an exercise in analytical demystification”

I combined the use of e-mail questionnaire, semi-structured interviews, direct observation, documentary research, and case study methods in my fieldwork. The enterprises, the university from which they spun off and the high-tech development zones in which they were located were selected on the basis of their accessibility. The selected companies, universities and high-tech development zones are among the samples selected in the background study of high-tech spin-offs in Chapter 5.

Chapter 5 The Evolution of High-tech Industry in the Context of China in Transition

Introduction

In the past two decades, China has undergone intensive transformation in terms of industrialisation and urbanisation; at the same time, it has experienced transition from 'the plan' to 'the market' and from isolation to gradual integration into the world economy. Starting as a low-income 'non-core innovator' country, China has encountered the challenges of developing an 'old' manufacturing economy, mass-production and the New Economy simultaneously in a uniquely short period. This thesis argues that a 'catch-up' strategy relying on technological diffusion has its inherent limits for China and that transition through the different stages of economic development is neither necessarily linear nor gradual nor does it happen automatically. This thesis argues that China's government has taken an active approach to the challenge of industrialisation and the fostering of new and high-technology industries to provide breakthroughs in sustaining economic growth. As the driving force of the New Economy¹, the role of government in the development of high-tech sectors in China is the focus of this chapter.

In the first part of the chapter, the analysis of the high-tech industrial sector in the context of China-in-transition presents the contextual circumstances in which China has recently found itself. In part two, based upon an institutional approach to change, I present the process through which the high-tech sectors in China have evolved. I discuss the role of government in fostering China's high-tech sectors through institutional innovation,

¹ New Economy: the 'New Economy' has been a highly nuanced concept. The term was originally coined to describe the performance of the US economy in the 1990s: often referred to as the 'American Phenomenon' and characterized by high productivity and growth rates, yet with low levels of both unemployment and inflation¹, it represented a stark contrast to the post-war decades of the 1950s through to the 1980s when economies seemed forever dogged, in traditional 'Phillips Curve' style, by periodic bouts of *either* inflation *or* unemployment. Subsequently, the term 'New Economy' became identified with those sectors of any economy characterized by high-tech industry, driven by ICT, enjoying booming capital markets and associated with intensified globalisation (in contrast to those elements of the economy dominated by traditional industry) promising a new economic dawn without periodic boom and bust.

highlighting the policymaking and management of two major government projects in the post-reform era under Deng Xiaoping and Jiang Zemin: The National High Technology Research and Development Programme of China (863) and The Torch Programme. This thesis argues that the springboard for growth of the high-tech sectors in China in this period was the science and technology and R&D capabilities that had accumulated under Mao in which the unique ‘government-industry-university (R&D institution)’ partnership was originally forged. China’s prior institutional framework allowed government and the universities (R&D institutions) to engage in activities that have gone far beyond basic research and which have been the early driving forces for product development and commercial adventures in high-tech sectors.

5.1. The development of the high-tech sector in the context of China in transition

China has achieved both remarkably fast and generally stable rates of economic growth in the past 20 years. Having seen ‘made in China’ products ranging from labour intensive low value-added goods such as toys and textile goods to high-tech high value-added computing and telecommunications products flooding world markets, some western observers have argued that China has successfully turned itself into the ‘workshop of the world’² with its massive manufacturing power. However, according to the latest Global Competitiveness Report (Cornelius, Blanke and Paua, 2002, p.11-13), China remains classified as a low-income ‘non-core innovator’ country. Its authors adjust China’s competitiveness by taking out the part of growth that is related to the ‘catch up’ phenomenon. Because the latter is temporary, its authors argue, it disappears once low-income countries have caught up with richer economies and should therefore be ignored. Thus, according to the Growth Competitiveness Report (2002), China’s competitiveness ranked only 38th out of 80 countries and only 63rd in terms of technology, weighting ½

² Chinese scholars argue that there is still a long march ahead for China to reach before it can be truly described as the ‘workshop of the world’. According to their research, China contributes 7% of the outputs of manufacturing industries world-wide, by contrast, that United States and Japan contribute 22% and 14% respectively.

to 'core innovators' and 1/3 to 'non-core innovators' in the Growth Competitiveness Index (GCI).

China's economic reform occurred in the time that the accelerated scientific and technological breakthrough, particularly in information technology, marks the beginning of a "New Economy" in human history. Grasping the New Economy for China has involved profound transformation of all industries. Such a change is equivalent in scope and depth to the rise of the manufacturing economy in the 1890s and the emergence of the mass-production, corporate economy in the 1940s and 1950s in the west. It has taken western developed economies a span of two centuries to go through the various stages of transformation. However, post-reform China has encountered the challenge of developing a mass-production manufacturing economy more-or-less from scratch in a significantly shorter time span (no more than twenty years or so) *while at the same time* engaging in its transformation into a New Economy.

New growth theory identifies technological change as a key factor in economic development and technology is given a high weighting in gauging a country's competitiveness, requiring, first and foremost, an analysis of the extent to which that country is able to achieve technological progress. The way technology affects economic growth is dependent on the level of economic prosperity a country has already achieved.

Porter (1990) identifies three stages of economic development: factor-driven, investment-driven and innovation-driven.³. Thus, in his analysis, at early stages of economic development and once a country has exhausted the benefits of low-cost factors of production, a country's ability to launch its economy on a steeper growth path depends primarily on the transfer of technology from abroad. According to the Global

³ Factor-Driven stage: firms produce commodities or relatively simple products designed in other, more-advanced countries. Technology is assimilated through imports, FDI and imitation.

Investment-Driven stage: efficiency in producing standard products and services becomes the dominant source of competitive advantage. Technology is accessed through licensing, joint ventures, FDI and imitations. At this stage, firms not only assimilate foreign technology but also develop the capacity to improve on it, extend capabilities more widely in the value chain.

Innovation-Driven stage: the ability to produce innovative products and services at the global technology frontier using the most advanced methods becomes the dominant source of competitive advantage.

Competitiveness Report (2002), developing countries that have experienced rapid economic growth are typically those that are successful in rapidly absorbing and disseminating the advanced technologies and capital of the more technically advanced countries - known as *technological diffusion*. This process of 'catch-up' growth has been very important for developing countries but for any country to advance further it is necessary to achieve a new competitive advantage by developing unique products and processes at the global technology frontier.

Yet as Cornelius (2002, p.10) argues: "The transition through the different stages of economic development is not necessarily linear or gradual, nor does it happen automatically." As a large developing country, China has faced the challenge of balancing the needs of development of high and new technology industries with traditional industries, of capital- and technology-intensive industries with labour-intensive industries. Thus, to accomplish industrialisation *and* modernisation has been regarded by the Chinese government as a vital historical task. Unlike in 'core innovator' countries where, as the New Economy develops, increases in manufacturing productivity leads to a decline in the number of factory jobs and their share in total employment, in China, it has been necessary to ensure the sustainable growth of the traditional and new industries of mass production *at the same time* as promoting the New Economy given the need to absorb the vast numbers of endogenously displaced agricultural workers.

Yet in order to advance the competence of traditional industries, it has been necessary to transform them with high and new technology. Manufacturers who use more high technology (e.g., computer-aided design) in their production processes export more, and are more productive than manufacturers who do not. Meanwhile, it has been equally important to accelerate the development of the high-tech industries, the modern service sector and to enlarge the proportion of the tertiary industry in the national economy. Thus the ongoing process of industrialisation of China has been *intertwined* with the rise of the New Economy.

As a 'non-core innovator country', technology transfer has played a considerably more important role than innovation in China's development in the last 20 years. China has actively participated in international economic and technological cooperation and competition and has opened up to the outside world⁴. China's kinship with Taiwan, Hong Kong and Singapore, classified as 'core innovator' countries in 1990s, has provided an important channel through which China has gained access to the global technology frontier⁵.

Yet while China has achieved very high rates of growth, 'catch-up' growth with reliance on *technological diffusion* has had its inherent limits and constrains the international competence of the mass manufacturing sectors.⁶ As a result, the Chinese government has recently proposed a strategy for accelerated development by 'taking a new road to industrialisation'. In President Jiang Zemin's speech at the 16th Party Congress in November 2002⁷, he concluded by arguing that China needed to "take a new road to industrialisation and implement the strategy of rejuvenating the country through science and education and that of sustainable development... We must press ahead to optimise and upgrade the industrial structure so as to bring about an industrial pattern with high and new technology industries as the leader, basic and manufacturing industries as the kingpin and the service industry developing in all areas. We must give priority to the development of the information industry and apply IT in all areas of economic and social

⁴Jennifer Blanke, Friedrich von Kirchbach, Mondher Mimouni and Jean-Michel Pasteels (<http://www.weforum.org/pdf/gcr>), economists from International Trade Centre and World Economic Forum, find that developing and transitional countries are seeing important improvements in their export performance over time. Curiously, improvements largely driven by increasing FDI flows are taking place at the higher end of the investment and technology ladder – in sectors with higher value added goods, such as IT and consumer electronics.

⁵According to Huang Yasheng (2001), 60% of FDI to China come from overseas Chinese societies in the region of Asia and the Pacific Rim.

⁶Chinese DVD manufacturers are the leading producing force of DVD, however, the 'core' technologies and patents of DVD are held by an international DVD manufacturing union of 6 multinationals from Japan and Europe – 6Cs. Chinese manufacturers only holds 6 core patents out of 32, although they have claimed the most patents in non-core technology and design of DVD. Therefore, Chinese manufacturers have to pay \$10 as a patent fee to 6Cs for every DVD they sell.

⁷Full text of Jiang Zemin's report at 16th Party Congress of the Communist Party of China, 2002. <http://www.china.org.cn/english/features/49007.htm>

development. We must develop high and new technology industries to provide breakthroughs in stimulating economic growth.”

In taking this ‘new road to industrialisation’, the Chinese government is thus reinforcing a strategy based upon a consideration of the context of China as a developing country while at the same time accommodating the challenge of the New Economy.

5.2 The Evolution of China’s High Tech Sector

5.2.1 Institutional Evolution

5.2.1.1 The theory of reconstitutive downward causation

“The situation of today shapes the institutions of tomorrow through a selective, coercive process, by acting upon men’s habitual view of things.” - Veblen (1899, p.190)

Studies of Chinese transition frequently contain themes of ‘government vs. market’ and ‘bureaucratic (political) ends vs. economical efficiency’ although some scholars have gone beyond this framework by recognizing the unique characteristics of China’s transition, by examining ‘the economic role of government as a variable’ and by taking a look at ‘the interests and roles of government officials’. As they have indicated, “the macro question is whether the logic of efficiency and economic rationality will guide Chinese enterprise reform, rather than embedded political and institutional norms. At the micro level, the question is whether the future direction of enterprise reform will reflect strategic and operational needs rather than a desire to retain political control and placement.” (Edwards, 1998)

Much recent research on China’s high-tech sector has followed the logic of the above framework. Francis’s empirical work (1999) on the science and technology sector in

Beijing concentrates on exploring new ways of combining business autonomy with a changed role for government. Gu's research (1997) follows the same outline: according to his research, highly successful enterprises in the information technology industry – the Founder Group, the Legend Group and the Stone Group - are officially categorised as collectively owned or state-owned but they have considerable strategic decision-making autonomy. This autonomy has, in effect, turned state support into a *business asset* rather than a liability. Science-based companies have thus evolved a new form of corporate governance, which renders their official ownership status little more than nominal. The government obliges these companies to meet certain requirements but it refrains from direct intervention in their business. This arrangement offers a model of evolution towards managerial autonomy and non-bureaucratic practices within state-controlled organisations.

Instead of following the above framework to interpret Chinese high tech sector, however, this thesis takes an institutional approach which involves interpreting the evolution of the high-tech sector as a process through which both 'economic rationality' and 'institutional (political) norms' at the macro level, and 'strategic and operational needs' and the 'desire to retain political control and placement' at the micro level are intertwined forces that dynamically shapes the path of institutional change.

Institutional transformation cannot be explained by starting from an institution-free state of nature. Institutions involve rules, constraints, practices and ideas that can sometimes, regarded as constraints, *mould* individual purposes and preferences in different ways. Menger's 'bottom up' approach first analyses the role of constraints in institutional evolution, proposing that habit formation greatly enhances the formation and stability of institutions. The process of habit formation, resulting from institutional channels and constraints, is described as '*reconstitutive downward causation*' by Hodgson & Knudsen (2001), in which institutions and constraints have a capacity to mould individual preferences. Once habits become established they become a potential basis for new intentions or beliefs. As a result, shared habits become, dialectically, the constitutive

material of institutions, providing them with enhanced durability, power and normative authority. (Hodgson, 2001)

The market itself is an institution (Hodgson, 1988; Loasby, 2000). “The market involves social norms and customs, instituted exchange relations, and – sometimes consciously organised – information networks that themselves have to be explained. All market and exchange relations themselves involve complex rules and cannot be institution-free” (Hodgson, 2001, p.114). As Viktor Vanberg (1985, p.75) puts it: “ What we call a market is always a system of social interaction characterised by a specific *institutional framework*, that is, by *a set of rules* defining certain restrictions on the behaviour of market participants.”

5.2.1.2 Downward reconstructive entrepreneurship from the collective legacy

Although few civil high-tech industries producing commercial products in the west existed in China at the end of the Mao era, this did not entail a lack of development of modern science and technology under Mao. On the contrary, state education and research institutions were established and developed under the ‘*tiao kuai*’ system⁸. However, most R&D capacity was concentrated in the military and defence industries which were given top priority at that time. The then planned system was highly efficient in terms of mobilising available sources to complete key projects, notably in successfully launching ‘two missiles and one satellite’ in the 1960s and early 1970s. By the end of the Mao era in 1976, China had established R&D capability with teams of scientists and researchers based mainly at universities and research institutes attached to respective industrial ministries. Under the system of planning, R&D units conducted academic and research projects assigned within their ‘*tiao*’ or ‘*kuai*’ systems, which received the allocated funding from the central fiscal plan and then distributed it to units accordingly. All

⁸ *Tiao & Kuai* (Vertical & Horizontal): it was the administrative structure of China under the planned system. All functional ministries and line industries under the direct control of the central government through the State Council were ‘*Tiao*’ systems which within themselves had administrative hierarchy from the central to grass roots. ‘*Kuai*’ referred to the local authority that governed the local functional departments and industries. In this study, universities and research institutions directly controlled by the

universities and research institutes were (and most still are) state-owned and research projects were conducted collectively in highly organised project units. Therefore, instead of relying on markets for the allocation of labour, technology and capital as 'a set of rules' *moulding* economic actors behaviour under market-oriented institutional arrangements, the planned '*tiao kuai*' system relied on rigid political and administrative forces which constituted the 'rules' governing participants' behaviour. The institutional arrangements and norms of 'party / state' provided the springboard from which the later reform started. At the micro level, the accepted norms and habits under the 'party / state' structure stressed the collective good and individualism was viewed as politically incorrect.

Under Deng Xiaoping's leadership from the early 1980s, ideological constraints were gradually lifted and the strategic priority was shifted from political struggle towards economic construction. At the macro level, change started by a modification of the rigid planning system by progressively incorporating market principles. The reform of administrative institutions followed the policy of "releasing rights and sharing benefits", starting from the reform of fiscal policies allowing local government to retain local tax revenues. The economic structure was adjusted by transforming parts of the military and construction industries into civil production and stressing the importance of developing the tertiary sector previously neglected under Mao. At the micro level, the non state-owned sector was allowed to develop and State Owned Enterprises (SOEs) were allowed to generate and retain capital. People were allowed to pursue their individual interests.

Deng Xiaoping emphasised the importance of science and education for the economic development of China. Once he came into power, the first National Science and Technology Forum was held in spring 1978, later referred to as 'the spring of science and technology'. There was a need to apply the R&D strength that had accumulated under the Mao era in civil sectors to serve the long-term development objectives of the 'Four Modernisations' of China. This process was intertwined with the transition from

State Education Committee, Ministry of Science and Technology and other ministries are defined as '*Tiao*' units; and those governed by local authorities are classified as '*Kuai*' units.

planning to the market which started with the incorporation of competition and market principles into the system and which gradually progressed by building up market-oriented institutional infrastructures. It was a 'reconstitutive downward' process. People whose lives had been spent in military and political struggle gradually adjusted to the market economy. Meanwhile, in the science and technology sector, the institutional need was to bring together the technological strength already developed within public research institutes with the opportunity-seeking, flexible entrepreneurship that characterised the traditional Chinese model of doing business. This required an accommodation between the cultures of bureaucracy and enterprise and necessitated the establishment of an institutional norm of *entrepreneurship*. Nonetheless the formation of any new norms were constrained and 'moulded' by the prior planning system and the norm of the collective good.

5.2.1.3 Government's role in the Development of Science & Technology

According to the World Competitiveness Report, "government plays an inevitable role in economic development. Universities, schools, infrastructure providers and other national and local institutions must not just develop and improve their capabilities, but must also become more connected to the economy and better linked with the private sector" (World Economic Forum, 2002). However, the nuances of the economic role of 'government as a variable' and 'the interests and roles of government officials' have particular implications not only in different countries but also in distinct periods within the same country and should be interpreted within different 'contextual circumstances' (Stiglitz, 2000).

In the case of China's science and technology sector, at the initial stage of reform and transition in 1980s, the challenge came on two fronts, on the one hand developing science and technology *per se* to catch up with world leaders while, on the other, transforming the technological strength that had developed within public research institutes into 'productivity' and therefore serving the pragmatic needs of improving people's living standards.

When the reform started at the end of the 1970s, the state sector was the dominant force in the Chinese economy, which, in 1978, contributed 76% of GDP, with the collective sector contributing the other 24%. Throughout the 1980s, the non-state sector, Township and Village Enterprises (TVEs) in particular, flourished and increasingly contributed to economic growth in China. Thus, under the circumstances of a lack of a private sector and of market-oriented institutions, the development of the high-tech sectors was initiated by public research institutions within the planned economy. Its growth was intertwined with the process of transition as market principles were gradually established and the non-state sector gradually outperformed the state sector.

As indicated in Table 5.1, government funds were the principal source of finance for S&T in 1980s. With the development of the non-state sectors, funds from self-generated channels gradually increased. From 1995 to 1999, government funds contributed on average a stable 45% of total S&T finance. The share of self-generated funds increased sharply in 1998 up to 46.20% from only 2.5% in 1997. By 1999, for the first time, the share of self-generated funds (48.75%) exceeded that of government funds (47.8%.) The data indicates the general picture that government has been, until very recently, the primary source of S&T development although the non-state sector has now outstripped the government sources, while sources from finance institutions, as indicated by the share of bank loans, were trivial and declined after 1995. The sources of S&T finances have diversified and government is no longer the only channel of investment in S&T as the non-state sectors have played a larger role. However, the market oriented finance channel for science and technology remains weak. The role of public institutions has been vital in financing high-tech sector given the minor role that banks have played.

Table 5.1: Statistics on Higher Education for Scientific and Technological Activities
China Statistical Yearbook 2000: p688

Item	1995	1996	1997	1998	1999
S&T Personnel	324,279	332,008	326,202	345,159	341,910
Scientists & Engineers	307,985	316,354	311,622	311,417	328,991
R&D Institutions (unit)	3,431	3,398	3,306	3,241	3,1241

R & D Personal (10,000.year)	14.4	14.8	16.6	16.9	17.6
Scientists & Engineers	13.2	13.2	15.7	16.1	16.8
Fundamental Research (10,000 man. Year)	3.9	4.1	4.3	4.6	4.7
Applied Research	7.8	8.0	9.2	9.3	9.8

Sources of Funds for S&T (10,000 Yuan)	494,756	565,380	730,763	849,556	1,029,460
Government Funds	220,525	258,241	364,700	411,494	492,174
	44.57%	45.68%	49.90%	48.44%	47.80%
Self-raised	12,041	17,138	18,248	392,490	501,908
	2.43%	3.03%	2.50%	46.20%	48.75%
Bank Loans	11,748	8,302	7,126	-	4,509
	2.37%	1.47%	0.97%	-	0.44%
Total	49.37%*	50.16%*	53.37%*	94.64%	96.99%

Source: Author compiled with data from China Statistical Yearbook 2000 (p.688) and China: Facts & Figures 2001

*: Implies a large amount of 'undefined' capital in the statistics of 1995, 1996 and 1997.

5.2.2 The National High Technology Research and Development Programme of China – The 863 Programme

“We must have our own ‘fist’ products, otherwise we will be bullied and beaten”

Deng Xiaoping 1992

In order to narrow the gap between China and high-technology frontiers, the Chinese government launched The National High Technology Research and Development Programme of China, referred to as the 863 Programme (representing March 1986, the date it was initially proposed). The policy makers of the initial programme took the China context into consideration when they made the plan. As a large low-income developing country, China was not capable of investing full-scale into new high-technologies and it was impossible (and, indeed, not necessary) for China to compete with leading developed countries in every high technology front. Therefore, the programme followed the guideline of adopting high technology according to the pragmatic demands and capacity of China, selecting seven priority areas (biotechnology, information, automation, energy, advanced materials, laser and space) covering fifteen subject topics as national key projects⁹. The programme currently covers 20 subject topics selected from eight priority areas.

5.2.2.1 Policymaking and management of the 863 Programme

The programme learned the lessons of developed countries’ high-tech programmes but incorporated them with China’s ‘mass mobilisation system’ nourished in the Mao era. Based on the ‘hardware’ of extant institutions, the policy and management systems of the programme can be described as a ‘high-tech programme with Chinese characteristics’ in a number of aspects.

⁹. In 1993, telecommunication was added as a subject topic of the 863 Programme and from 1991 to 1995, there were other 4 subject topics added. In July 1996, marine was added as the eighth area of the programme

First and foremost, under state direction, the universities, colleges and research institutes were the key forces employed to conduct projects nationwide. As indicated in the latest statistics from the Ministry of Science and Technology (MOST), the host institutions of projects under the programme in 2001 were distributed in 28 provinces, municipalities and autonomous regions across the country. More than 20,000 researchers and administrative staff from over 3,000 research institutions, universities and enterprises across the country were involved¹⁰. Table 5.2 makes clear the continuing importance of universities and research institutes to the work of the 863 programme.

Table 5.2: Distribution by the nature of project undertaken (2001)

	Research institutes	Universities	Enterprises
Projects	38%	50%	12%
Expenditure	43%	43%	14%
Personnel	39%	46%	15%

(Source: The 863 Program Annual Report 2001)

Secondly the funding system involved direct appropriation of central government funds to key projects, circumventing the bureaucracy and other obstacles of the then planned fiscal and financial systems that otherwise might have slowed down the programme. Reforms led to the allocation of funding directly to the projects rather than to the 'directing units' (*zhu guan danwei*) of the universities research institutions, which belonged to different '*tiao*' and '*kuai*', thereby putting limited sources together to pinpoint the project.

Thirdly, the management of the programme was based on an expert management system established under MOST. This involved a field expert committee (FEC) and a priority expert group (PEG), the former responsible for supervision, evaluation and consultation regarding the implementation of projects in a specific field, the latter responsible for organizing the technical direction and process control. For key projects, a general expert

¹⁰ The top ten regions in terms of R&D funding accounted for 85% of the national total and the top ten regions in terms of project number accounted for 84% of the national total. Beijing, the top region in terms of project numbers had a 40% share of the national total; Shanghai ranked second with 11%, Hubei third with 6%. Many of the best Chinese universities and research institutes, including 32 of those which are classified as '*bu shu yuanxiao*' (under the direct leadership and control of the Ministry of Education), or

group (GEG) was set up to be responsible for organising the projects and ensuring their smooth implementation.

5.2.2.2 Success of the 863 Programme

The 863 programme can claim progress on a number of fronts. Firstly, it narrowed the gap between China and high-tech frontiers¹¹. In the biotechnology sector, new varieties of plants with high yields and tolerance were developed. Breakthroughs were made in developing new medicines, vaccines and gene therapy and in protein engineering. The government approved the first China-made anti-AIDS drug for clinical testing and China's human genome sequencing project was incorporated in the framework of the International Cooperation Programme. In automation technology, a breakthrough was made in the intelligent robot (IR) project and home-made robots were used in manufacturing industries; a project involving robots working at sea in depths of 6,000 metres was successfully completed, allowing China to conduct scientific research in 97 % of the oceans of the world.

Secondly, under the 863 Programme, breakthroughs in high-tech frontiers and applied technologies have provided China with strategic home-supplied technologies and products to compete with overseas multinationals, breaking their monopoly and technology constraints, specifically in the areas of ICT sector including intelligent computer system, optoelectronic device & systems integration technology, information acquisition and processing techniques¹².

which are directly controlled by Ministries, are based in these top three regions: Beijing, Shanghai and Hubei (province capital Wuhan).

¹¹ According to the statistics of the Ministry of Science and Technology (MOST), 1,200 projects were completed in the first ten years, covering five priority areas, 540 of which were classified as operating at 'world level', and 244 projects were granted international and national patents. Among 36 key technology projects that were selected by MOST when the programme was initiated in 1986 and were started largely from scratch, 60% were completed at 'approaching world level' by 1996, 11% were conducted at 'world level' and 25% made progress although they were evaluated as 'below world level'.

¹² More than 20 varieties of home-made servers have been introduced widely used domestically. The Dawning 2000-11 Super Server was successfully developed. The 'Hangwang-99' handwriting recognition systems and the 'Tsinghua Wentong' printed Chinese character recognition systems (OCR) held the largest

Thirdly, the programme has promoted commercialisation and industrialisation of completed projects. The implementation of high technologies has reshaped traditional industries and enhanced the productivity and the competence of China's manufacturing sector. The breakthroughs in information technology, biotechnology and other high-tech sectors have provided China with opportunities for China to build up its own New Economy sector¹³.

Fourthly, the 863 Programme has nurtured a new generation of leading scientists. The programme invested heavily in basic research and sponsored 70% of the papers in computing science published and presented by Chinese scientists in international journals and conferences. Within ten years, there were more than 30,000 scientists involved in the programme receiving funding providing the backbone of China's science & technology national effort.

5.2.3 The Torch Programme and the Introduction of High-Tech Development Zones (HTDZs)

In August 1988, MOST launched the Torch Programme. While the 863 programme put emphasis on long-term R&D in the strategic and cutting-edge high-tech sectors, the main

shares of the domestic market while the Chinese-supporting platform of 'Sitonglifang' won a market share of more than 50%. The R&D on the 'third-generation semiconductor' was conducted at 'world level'.

¹³ The Programme established bases and projects to facilitate the *application* of research outcomes and university-industry partnerships were encouraged. For example, in the Automation Technology sector, Contemporary Integrated Manufacturing System (CIMS) technology which started from scratch at the outset of the 863 Programme had within ten years established ten CIMS training centres nationwide and given CIMS training to 400,000 people including 37,000 chief engineers and company experts. The CIMS Centre at Tsinghua University and Huazhong University of Science & Technology were awarded University Lead Awards by the Society of Manufacturing Engineers (SME) in 1994 and 1999 respectively. Their achievements made China only the second country to receive the award more than once, the USA being other. CIMS technology has been applied widely in 11 industries including China's key exporting engines, including the textile, electronic and machine tool industries and provided competitive advantage for Chinese products. By 1999 a Contemporary Integrated Manufacturing System Virtual Network (CIMSNET) had been established, realizing nationwide integration and sharing of contemporary integrated manufacturing technology information and resources and promoting the dissemination and application of CIMS on a networking basis. Ten universities and five institutes in China jointly undertook the CIMSNET project.

mission of the Torch Programme was to focus on the *application* of completed R&D and on the commercialisation of market-oriented technologies that would benefit business quickly. In terms of administration and management, while all 863 Programme projects were (and still are) are monitored and directed by MOST at central government level, the Torch Programme is administered at both central and local level.

Between 1988 and 1999, the Torch Programme made significant progress with a total of 18,888 projects completed, 5,045 classified as 'nation level projects'. The scientific breakthroughs under the 863 Programme and the pragmatic application of schemes under the Torch Programme provided the essential foundation for the formation of clusters of high-tech industries¹⁴.

With the purpose of filling the gap between basic R&D and commercialised application, the government adopted the method of fostering Science & Technology Industrial Parks. At the same time, MOST instituted a network of High Technology Development Zones (HTDZ) across China to facilitate the Torch Plan and support the commercialisation of basic R&D at local level¹⁵.

¹⁴ In ICT area, leading companies including Huawei Technology, ZTC, Great Dragon Technology and Giant Tang Technology formed the cluster of telecommunication equipment, and Chinese manufacturers are capable of competing with multi-national giants Northern Tel, Cisco on international markets. With 7 semi-conductor companies, China currently holds the second largest manufacturing power in producing computer chips, with America being the first¹⁴. The formation of new clusters upgraded the structure of China's export products from low value added as majority to currently with significant part of high tech high value added goods.

¹⁵ The major functions of HTDZ, according to the MOST, were: 1). The building-up of high-tech industrialisation bases. 2). The establishment of 'demonstration sites' for science and business links, accelerating the *application* of research outcomes and stimulating applied technology innovations. 3). The provision of a source for enhancing the competence of traditional industries with high technology. 4). Fostering entrepreneurship. 5). Acting as a window for the 'open' policy. 6) Functioning as trial sites for in-depth reform of governance in terms of institutional innovation.

The Shenzhen High Technology Industrial Park was opened in July 1985. In May 1988, the State Council approved the establishment of the first national level High Technology Development Zone – Beijing HTDZ. Thereafter, through 1991 to 1997, the State Council permitted the establishment of 52 other national level HTDZs, are located in 29 provinces, autonomous regions and municipalities. HTDZs in China have made rapid progress throughout the 1990s. By 1999, there were 17,498 high tech companies registered in 53 HTDZs, which hired 2.21m employees, the industrial turnover exceeded 600 billion Yuan, generating 85.6 billion Yuan in the form of profits & taxes.

5.2.3.1 Characteristics of the Torch Programme

First and foremost, the programme was (and is) *state-led*, collectively conducted through cross-ministry co-operation. In contrast to 863, the Torch Programme covers lower but wider technology areas and was conducted by both central and local authorities but, as with 863, in addition to the establishment of new institutions, the programme initially relied upon extant institutions, including the ‘*tiao*’ and ‘*kuai*’ system.

High-tech companies registered in HTDZs under the Torch Programme benefited from a range of favourable policies. In terms of taxation, for the purpose of stimulating the development of applied technology and promoting its commercialisation and industrialisation, MOST and the State Bureau of Taxation consistently provided significant tax breaks¹⁶. With regard to financial arrangements, from 1990 MOST and the China Industrial and Commercial Bank, Construction Bank and Agricultural Bank jointly issued regulations that favoured high-tech companies in the provision of special loans for R&D and applied high tech projects. In terms of customs policy, high tech companies registered in HTDZs were allowed to set up duty free storehouse and manufacturing plants within the zone¹⁷. In 1991 MOST issued new regulations that simplified the application process for going abroad from high-tech company chiefs. Meanwhile, cross-ministry co-operation has played a key role in fostering the cluster of high tech industries. For example, in 1998 six ministries, including the State Planning Committee, Ministry of Education, MOST, Ministry of Electronic Industry, China Academy of Science and the

¹⁶ At an early stage of the programme, in December 1989, MOST and the State Bureau of Taxation issued a new regulation to exempt tax duty on lab products for mass production developed by research institutes. Subsequently, in 1991, according to the then newly-issued “Law on Science and Technology Progress of P.R. of China” and State Council regulations, high-tech companies registered in HTDZs became entitled to favourable taxation policies including 1). An income tax rate for high- tech companies of 15% (compared with that of 55% on SOEs in traditional sectors), while for those high-tech companies whose export turnover contributed more than 70% of the total turnover, an income tax rate of 10%. Newly established high tech companies were exempted from income tax for the first 2 years of production. 2). Newly established high- tech joint ventures with foreign partners with a co-operation period over 10 years were exempted income tax for the first 2 years in which profits were generated. Favourable taxation policies were issued at both central level and local level and local governments to some extent competed with each other by providing more attractive policies for high tech business.

¹⁷ In 1995, China Custom opened the first customs branch in Beijing Zhong GuanCun HTDZ to improve the efficiency and convenience of the custom service for high tech companies. High tech companies also benefit from favourable custom tax policies on their exports.

Bureau of Technology Supervision, worked together on a national strategy to foster the development of the software industry primarily in HTDZs¹⁸.

Secondly, as with the 863 programme, the implementation of the Torch Programme has fundamentally relied on R&D strengths in the universities and research institutes. Indeed, one of the main missions of HTDZs has been to provide guidance and support for academics from university and research institutes to 'commercialise' their research outcomes¹⁹. Most HTDZs were established in university districts.

MOST and the Ministry of Education, the governing body of 32 top Chinese comprehensive universities, built up strategic cooperation. Under their joint direction, the 'University Science & Technology Park'(USTP) project was established in 1995 for the purpose of fostering technology innovation and cluster formation²⁰. With the aim of attracting overseas Chinese scholars, 25 Business Hatches for Overseas Scholars were set up hand-in-hand with USTPs to provide business start-up opportunities for overseas Chinese, especially for those who left university for adventures abroad and obtained frontier technologies in western countries.

Thirdly the Torch Programme instituted a new management system to include HTDZ Management Committees. Unlike extant government functional departments, the committees were originally set up as semi-NGOs, the nature of which was close to that of an agent, functioning as a connection between the academic and business worlds. They

¹⁸To date, 22 'software Industry Bases' have been established with more than 3,700 registered companies hiring 170,000 employees. By 2000, the total turnover of software companies registered in 22 bases exceeded 65 billion Yuan.

¹⁹ For example, the Beijing HTDZ was located at Zhong Guan Cun where Beijing University, Qinghua University, the China Academy of Science, Peoples University and other important research institutes are based. Zhong Guan Cun has been transformed from a suburb campus into a high tech zone with world leading ICT manufacturers and their associated research institutes, including Chinese groups such as Legend, Founder, Sitong, DaTang, originally spin-offs of universities in that zone, and American blue-chips such as Microsoft China and Motorola China.

²⁰During the 9th Five-Year Plan, relying on 67 universities' R&D forces, 22 University Science & Technology Parks were established. There were 2,778 companies registered within the parks and attracted an investment total of 17 billion Yuan. In 2000, the total sales of the Parks was more than 25 billion Yuan, with an increase of 91.6% in twelve months. Registered companies developed 2,191 kinds of home-made new products and obtained 4,813 intellectual property rights and registered patents. 3,482 units

became the creature of the needs of both ‘development’ and ‘transition’, facilitating the development of high-tech businesses following market principles.

5.2.3.2 HTDZs - The semi-authority, semi-entrepreneurial institutions

The HTDZ management committees were a hybrid of the transition process, originating from the old system as a ‘market force’, yet incorporated into the ‘old’ system as ‘new’ blood²¹. By nature, they were ‘semi-authority, semi-entrepreneurial’ institutions. Originating from their semi-entrepreneurial nature, they have, indeed, pursued their own economic interests as market actors. However, they have taken the advantage of their ‘authority’ origin and benefited in terms of access to limited sources. The HTDZs, unlike old institutions, have been encouraged to function as enterprises rather than as purely bureaucratic organisations²².

The HTDZ management committees were semi-authority, in the sense that they initially were not granted *lixiang qun* - the official status allowing the operation of state project with the central planned resources. The reform is a process of the redistribution of administrative power. As newly innovated semi-authority institutions, the HTDZ management committees did not hold substantial administrative power. The committees acted as the *institutional lobbyist* integrating the sectioned government forces and resources that were located within their relevant ‘*tiao*’ & ‘*kuai*’ line bureaux and making

²¹ Starting as a semi-official institution, poorly equipped with limited staff, the HTDZ Management Committee played the role of ‘official’ agent. With central government’s increasing emphasis on high tech sector, the fast expansion of HTDZs and the robust growth of business within HTDZs, in February 1995, 7 years after the first HTDC opened, the State Council finally approved the HTDC Management Committee, which governed 26 HTDZs at the time, with the status of ‘*shiye* (governing) unit’ equivalent to the status of the science committee at local level. With the growing importance of HTDZs in local politics and economies, the HTDZ Management Committee was granted a higher bureaucratic position, the head of the committee, very often, being deputy Mayor of the city.

²² Acting in their semi-official function, HTDZs organised training courses for high-tech enterprises to adopt market-oriented systems, acting as both ‘organiser’ and ‘referee’ of the reform. Various training courses on modern enterprise and share systems were delivered through the HTDZ system. However, the HTDZ Management Committee turned out to be ‘player’ as well. In 1994, Zhongshan Torch HTDZ was, as the first of 53 HTDZs, transformed into a public company and floated on Shenzhen Stock Exchange in 1995.

them available to the start-up new technology-based enterprises (NTEs). The committees persuaded the line bureaux and government authorities such as the department of power, the industrial & commercial bureau and the bureau of land to open an office in the HTDZ and provided 'a basket of service' to the start-up NTEs. These efforts reduced the transaction costs significantly and nurtured the start-up NTEs effectively.

The HTDZ management committees were originally established to provide service to the non-traditional new technology-based enterprises (NTEs) emerging in the development of the market economy. They functioned as the link between the market-oriented NTEs and the government authorities. The HTDZ management committees guided the high-tech business initiators going through the administrative hierarchy to apply for state funding for NTEs, such as those from the Torch Programme. The first innovative business hatch was established in Wuhan East-lake High-tech Development Zone in 1987 and its main task was to provide start-up service to NTEs created by university academic and R&D staff. The management committee offered the following services and support to the start-up NTEs: (i) evaluation of the project according to national standards (ii) how to document the code of the company and contracts (iii) how to raise start-up capital (iv) how to pay tax and (v) how to provide office facilities including telephone, fax, photocopiers to start-up NTEs.

With regard to the fund-raising function, the HTDC management committees helped the start-up NTEs to *pao yinghan* (deal with banks), i.e. to get hold of loans from state-owned banks in the end of 1980s. In the early 1990s, after venture capital investment was introduced in China, the committees guided and supported the start-up NTEs to obtain venture capital, which was by nature state resources in the sense that it was allocated via state fiscal plan. At the end of the 1980s, the first 'guarantee company' was set up in Wuhan East-lake High-tech Development Zone with fiscally allocated capital. The early state funded venture capital investment companies did not develop successfully. They merely served as the channel for government to nurture NTEs, described as *zhengfu*

zijing, shichang caozuo (government capital, market operation).²³ In the sense that the HTDC management committees facilitated the *zhengfu zijing* into *shichang caozuo*, this thesis argues that the committees had semi-entrepreneurial features.

The HTDC management committees were “sandwich positioned”²⁴ between the emerging non-traditional NTEs and the extant administrative and resource allocation system. The officers described the status of the committees as *zai madai li tiaowu* (dancing in a rice-bag)²⁵, in the sense that the committees were allowed to engage in entrepreneurial behaviour but their performance remained confined to administrative regulations and frameworks. Although today they unanimously argue that the government should retreat from the direct operation of high-tech business, according to field interviews with officers from Wuhan East-lake HTDZ and high-tech entrepreneurs, government nurture at the early stage was to some extent necessary.

²³ According to field interviews with officers from Wuhan East-lake HTDZ and high-tech entrepreneurs, government nurture at the early stage was necessary, although they unanimously argue that the government should retreat from the direct nurture and operation of high-tech business now.

²⁴ Zhang Dongping (2002), source: field interview

5.3 The *Evolution* of the Government-Industry-University Partnership in China

5.3.1 The evolution of the government-industry-university partnership resulting in diversified ownership structure of high-tech enterprises in transitional China

So far, we have examined the macro-level decision-making concerning the development of high-tech sectors in transitional China. However, appropriate macro-level conditions are necessary but not sufficient in themselves to provide opportunities to generate prosperity and create wealth. Wealth is actually created at the micro-level by enterprises²⁶.

The development of the high-tech sectors owes much to the reforms, but also drew heavily upon the 'accumulated capacity' of science and technology built up in the previous era, particularly at an early stage. For much of the reform period that followed the Mao regime, the norms and methods of the past prevailed in governance and administration, serving as the principal instruments by which successive reforms incorporated market principles into the extant system.

Institutional arrangements constrain individual habit and behaviour. The reforms allowed research institutes to pursue units' benefits and individual researchers' chase after wealth was no longer regarded as a vice. The capacity to generate profit' (*chuang shou*) by turning research outcomes into commercial ventures turned out to be an assessment criterion as important as basic academic achievements for promotion, both political and academic, within the system. The interplay of these forces helped to create new positions for individuals and gave them an opportunity to play a part in the new order. As a result, the direct and indirect consequences of the reforms had the effect of creating new

²⁵ *ibid*

²⁶ Therefore, generally, there is a need to enhance the microeconomic business environment to foster the sophistication of company strategy and operating practices. The quality of scientific research institutions and of university / industry research collaboration are among variables that establish the microeconomic conditions in which firms compete.

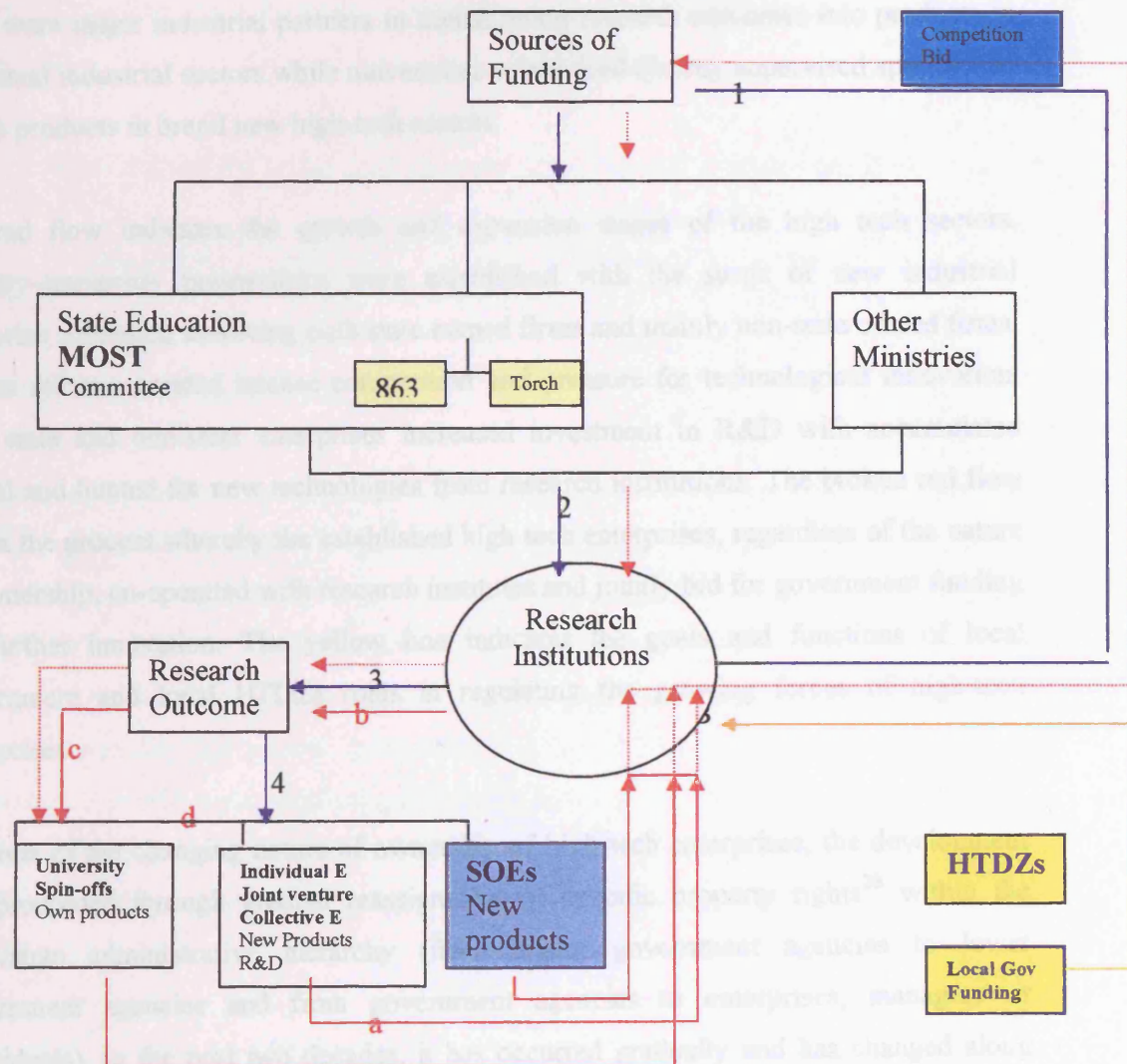
interests and groups, some with an explicit commitment to the reforms themselves, others seeking to find a role as the reforming measures began to erode their hitherto secure status.

Central government policies played a vital role in creating an appropriate environment to foster the transformation of S&T research outcomes into commercial ventures. The nature of the process, like the nature of the reform process generally, was that of trial and error without a uniform style. Fostering business ventures from previous state-owned and state-operated research institutes turned out to involve an interplay between transforming a 'work unit' (*danwei*) under the plan into an 'enterprise' in the market and converting technology into commercial products.

Research institutes and individuals were encouraged to co-operate with industry, firstly with SOEs and thereafter with the non-state sectors. The reforms were implemented at different rates, depending upon the initiative, energy and norms of the local officials, university leaders and scientists. It was a process which involved education and science and technology officials, R&D leaders and otherwise well-connected individuals within the system using the capital and influence they had accumulated within the administrative system and science and technology worlds of the previous era to pursue business ventures in the new one. The practical consequences of the reforms were less clear-cut and took time to emerge, often shaped by the personalities involved. As a result, there were diverse forms of business venture, including industry-university (research institute) partnerships which varied not only for businesses developing in different regions and from different universities, but also for businesses *originating from the same university*²⁷.

²⁷ See discussion in detail in following chapter 6 and 7.

Figure 5.1 : Government-Industry-University Partnership



(MOST: Ministry of Science & Technology, SOE: State Owned Enterprises, E: Enterprises, HTDZs: High-tech Development Zones)

— : Flow of G-I-U partnership at start-up stage

— : Flow of I-U partnership at growth and expansion stages

... : Flow of G-I-U partnership at growth and expansion stages

Source: compiled by the author

Figure 5.1 shows the evolution of high-tech business sectors. The blue flow indicates the circumstance at the start-up and survival stages of the enterprise: at this stage in 1980, the SOEs were major industrial partners in transforming research outcomes into products in traditional industrial sectors while universities established directly supervised spin-offs to launch products in brand new high-tech sectors.

The red flow indicates the growth and expansion stages of the high tech sectors. Industry–university partnerships were established with the surge of new industrial enterprise formation involving both state owned firms and mainly non-state owned firms. Market reforms created intense competition and pressure for technological innovation. Both state and non-state enterprises increased investment in R&D with accumulated capital and hunted for new technologies from research institutions. The broken red flow shows the process whereby the established high tech enterprises, regardless of the nature of ownership, co-operated with research institutes and jointly bid for government funding for further innovation. The yellow line indicates the goals and functions of local government and local HTDZs roles in regulating the growing forces of high-tech enterprises.

In terms of the changing nature of ownership of high-tech enterprises, the development has proceeded through gradual reassignment of specific property rights²⁸ within the party/state administrative hierarchy (from higher government agencies to lower government agencies and from government agencies to enterprises, managers or individuals). In the past two decades, it has occurred gradually and has changed along different paths in different sectors and regions over time. The evolution of high-tech enterprises has intertwined with the uneven patterns of reform and change among different sectors and among different scale of enterprises²⁹. As ownership has moved gradually away from traditional forms of state and collective toward a mixed economy,

²⁸ Specifying property rights includes the following questions: who exercises managerial control? Who has a right to income flows? Who has the right to assign ownership to other parties? How are the above rights enforced?

²⁹ Collective sector shifted toward the reformed, contracted, leased and private types of ownership earlier and more quickly than the state sector. Change from state/collective-owned towards private was employed primarily in small-scale enterprises. (Kung & Whiting, 1999)

high-tech enterprises have been pervaded by various forms of ownership over time: reformed state and collective, various forms of private enterprise – family firms, elite industrial empires and ‘private’ companies owned by government agencies and enterprises.

Table 5.3 The ownership structure of high-tech enterprises in China by the end of 1997

	State owned	Collective	Private	Individual	Shareholding	Others
Quantity	9,181	27,456	10,179	3,971	9,231	5,471
%	14%	42%	16%	6%	14%	8%

Source: <http://www.mystar.com.cn/p1202.htm>

In Figure 5.1, the blue flow illustrates the power of the administrative hierarchy that specified and enforced property rights at the early stage of reform, given the lack of market institutions and non-state sectors. Stages 1 to 3 represent the procedures involved in applying for allocated funding under the planned system. The crucial change came at stage 4: the decentralisation and reformed institutional environment allowed those who had inventions the opportunity to explore new opportunities for the development of production technology encompassing different configurations of property rights. With the creation of market institutions and the incorporation of non-state sectors, mechanisms to specify and enforce property rights were gradually decentralised alongside the expansion of high-tech enterprises.

5.3.2 Characteristics of University Spin-offs

Among different types of business ventures in the high-tech sector, university spin-offs in China have had a distinctive development path. China’s high-tech industries have, from their inception, been dominated by spin-offs (Gu, 1994, Baark, 1994). As we have argued earlier, universities and research institutions have played a vital role in the transitional development of high-tech sectors. In contrast to the model developed by Vannevar

Bush³⁰ which was presumed appropriate to the post-war American market economy in which “government should keep mission-oriented research in the hands of federal agencies and be the main founder of scientific (basic) research in universities, allowing individual scientists to decide how research funds are allocated and how research is conducted and applied”, China’s prior institutional framework³¹ has allowed government and the universities to engage in activities that have gone far beyond basic research and which have been the early driving forces for product development and commercial adventures. Unlike western counterparts, Chinese universities have set up departments of ‘industrialisation’ and ‘industrial-academic-research’ (*chan-xue-yan*) committees to organise and develop business spin-offs. These spin-offs represent a fundamental institutional innovation which alters the organisational relationship between R&D and entrepreneurship.

Universities, research institutions and their governing bodies have played a crucial role in the start-up of high-tech spin-offs in terms of providing financial support. The Torch Programme identified spin-offs as the preferred strategy to commercialise technology resources. According to Gu (1994), most high-tech enterprises operating nationwide in 1993 were set up with assistance from public institutions. Universities have not only acted as organisers and liaisons but have also converted themselves into corporations. Most high-tech spin-offs were registered as ‘collectives with a supervising unit’ (Gu, 1994) even when the universities and other public institutions they belonged to initially engaged in the top management and remained as the ultimate controller, in terms of voting rights by shares and after they had grown into multinational publicly listed companies.

³⁰ Vannevar Bush: a noted MIT electrical engineer, he proposed the model in his 1945 report to President Truman with the title “Science: The Endless Frontier”.

³¹ The decentralisation of fiscal and managerial control has been accompanied by a decline in central government funding for public institutions on the premise that they should become increasingly self-financing. All elements of the public sector have become involved in setting up business ventures (Lin Yimin and Zhang Zhanxin, 1999), including universities and research institutions.

Table 5.4 shows the evolution of university high-tech spin-offs in China in terms of property rights arrangements, management style and organisational structure.

Table 5.4: Development stages of high tech spin-offs

		Period	PR	Ownership	M Style	O Structure
1	<i>Start-up</i>	80s-92	Contract Responsibility / Contract leasing	The reformed collective firms	University DS Individual E	Unstructured
2	<i>Survival</i>	Early 90s	Contract Responsibility / Contract leasing	Contracted public firms / leased public firms	University SS Individual E	Simple
3	<i>Growth</i>	92 onwards	Joint Stock	Mixed ownership (Including private)	Entrepreneurial, Co-ordination	Functional, Centralised
4	<i>Expansion</i>	92 onwards	Joint Stock Shares offered on stock exchanges	Mixed ownership (Including private)	Inception of Professional Administration	MES Decentralised
5	<i>Maturity</i>	90s middle onwards	Joint Stock Shares offered on stock exchanges	Mixed ownership (Including private)	Professional Administration	MES, Multinational Decentralised

(PR: Property Rights, T M: Top Management, M: Management, O: Organisational

DS: Direct Supervision, SS: Supervised Supervision, MES: Modern Enterprise System, E: Entrepreneur)

Source: compiled by the author

In the following chapters, this thesis employs the case studies to explain the evolution of ownership and property rights with new high-tech enterprises (mainly high-tech spin-offs) at the start-up stage over the period from the middle 1980s to 1992. In chapter 8, the research observes the further evolution of ownership within high-tech spin-offs from 1992 onwards through a survey based on secondary data and first hand investigative case study.

Chapter 6 Property rights arrangements of high-tech spin-offs at the start-up stage (1980 – 1992)

Introduction

As this thesis has suggested in previous chapters, the conventional wisdom of property-rights analysis provides an inadequate foundation for understanding the unique processes of transitional development of the high-tech sector in China. The objective of this chapter is to identify the nature of property rights arrangements of high-tech spin-offs at the start-up stage from the mid 1980s to the early 1990s and present an alternative approach to change. The approach focuses on the change of property rights arrangements in the process of the restructuring of institutional constraints on economic behaviour. This chapter adopts specific case study analysis to generate a general understanding of the role of property rights arrangements in the start-up stage of high-tech spin-offs in China.

In most post-socialist transitional economies, the R&D institutes to promote industrial technology were separated from the relevant industries; as a result, the productive ‘link’ between R&D institutes and production enterprises was simply deficient¹. This caused problems in terms of the efficient transfer of R&D output to industrial users. In order to tackle these problems, a systematic reform of R&D mechanisms was required.

As a response to the market-oriented reforms starting in the early 1980s, China’s centrally-planned science & technology (S&T) system began to adopt market-oriented mechanisms. In May 1985, the “Decision on the reform of Science & Technology System” announced that governments funds granted for R&D were to be gradually diminished and that ‘a technology market was to be created’. In order to reconstruct

¹ However, this problem did not apply to the Military industry and other projects classified as the priority of the state plan. Chris Freeman (1982) identified the problem in these terms: “most of the former Communist countries did actually invest fairly heavily in R&D activities. But this investment suffered from great distortions such as the huge military projects in old USSR, and the tendency to neglect the enterprise-level scientific and technological activities. Therefore the re-orientation and re-deployment of the science-technology resource in the former Communist countries is one of the most urgent problems which they confront.”

the S&T system in China², Chinese decision makers made attempts to borrow the historical experience of leading countries' S&T systems, that of the R&D models of the USA and Europe in particular. Since the 1970s, the accelerating pace of science & technology innovations created opportunities in allied activities and necessitated the development of new forms of linkage between university and enterprise.

The establishment of Science Parks with intensive R&D capacities represented the major institutional innovation for efficient technology transfer in many parts of Europe. For instance, two well-known centres of high-technology activities in Europe – the Cambridge Science Park (CSP) was established in 1970, and in France, the Zone pour l'Innovation et les Realisations Scientifiques et Techniques (ZIRST) in Grenoble in 1972. These regions were characterised by the formation of new technology-based firms (NTBFs) (Garnsey, E. & Alford, 1996, p.130-140) and were identified as high-tech centres clustered around a major innovative area.

NTBFs are well positioned as the motor for technology diffusion. First and foremost, they diffuse emerging technologies unavailable in industry, often emanating from science bases, mainly laboratories of universities and R&D institutions. They also explore novel methods of applying technologies that may have already been diffused in products and services. In the process, universities and R&D institutions high-tech spin-offs represent a major form of NTBFs³.

The first embryonic form of Science Park in China, Wuhan East-lake High-tech Development Zone, was founded in June 1987⁴, before the launch of the Torch Programme. The first (literature recorded) high-tech spin-off was established by Prof. Chen Chunxian from the Institute of Physics at Chinese Academy of Sciences (CAS) in 1980. In both cases, scholars inspired by their counterparts in the United States

² Mowery and Rosenberg's analysis with respect to institutional restructuring of intergrating R&D into industrial enterprises in the United States, and the Bush model regarding reshuffling R&D strategy after the World War II in the United States are aspirational historial analysis for the Chinese to observe.

³ The development of science parks differed from each other. Arguably different industrial & scientific policies, regional industrial tradition and different individual initiatives led to diversified paths of growth. Among various types of NTBFs, some were the outcome of a political project of development aiming at enhancing the local scientific potential, some benefited from an industrial tradition and from scientific expertise of the region. (Garnsey & Lawton-Smith, 1999, p.433-450)

⁴ It was not the first officially approved Science Park, but certainly was the first such institution that had ever been established in China.

raised the original idea and proposed plans to the relevant governing authorities⁵. Despite their small size and the non-official status of ‘peripheral projects’ not officially listed in the plan, they gained support from the State Science and Technology Committee (SSTC, later renamed as Ministry of Science, MOT) and endorsement from top leadership such as the then head of SSTC vice-premier Fang Yi. The political ‘green light’ for ‘trials’ was crucial and was the starting point for the expansion of commercially oriented high-technology activities. By the end of the 1980s, a significant number of spin-off enterprises had been established from universities and R&D institutes.

6.1 The formation of property rights and the ownership of new high-tech spin-offs at the start-up stage

6.1.1 Forms of ‘Spinning-off’ in China

In order to interpret the nature of spin-off enterprises appropriately, it is necessary to understand the forms in which the spinning-off process has taken. Gu (1994: 19-25) has identified three forms of ‘spinning-off’⁶.

“Form 1: Part of an organised institute is channelled into an independent NTE

This is a form of spinning in which a piece of the organised structure (manpower, technological and frequently physical assets) of the original institution is diverted to establish a new independent business entity.” (Gu, 1994, p.18)

New high-tech enterprises spinning-off through this form often did not start from scratch in terms of fixed assets, core technology and organisational, managerial infrastructure and human resource arrangements. According to survey data (Gu, 1994),

⁵ Professor Chen Chunxian set up an R&D consultancy company – the first technological development entity that financed and owned by the state (Source: Zhong Guan Cun Science Park Report, 1992). Local Science and Technology Commission (STC) officers and scholars and science officers from leading universities – Wuhan University and HUST- first raised the idea of creating a Science Park in mid 1980s (Source: interview).

⁶ In their survey, the researchers identified these forms from observations in both new technology enterprises (NTEs) and R&D institute establishments and confirmed their validity from Zone-level aggregate data.

this was the most important form of spin-off in terms of numbers of NTEs at the start-up stage. In Beijing, Wuhan, Shenyang and Hangzhou, 50%, 40%, 30% and 30% of the NTEs respectively, were established in this form.

“Form 2: S&T manpower moves as individuals into independent NTEs

This is a form of starting up NTEs resulting from the mobility of scientists and engineers, moving individually from their previous R&D institutes. Individual S&T experts frequently allied with each other in the initiation stage without any formal organisational involvement from their former institutes. “Scientific and technological knowledge, experience in R&D and design, innovative ideas, and management competence are their assets, which serve as the nucleus for the crystallisation of a new company.” (ibid)

“Form 3: an organised structure which remains a department of the initiating R&D institute

In this form of spinning-off, a part of the organised structure of the initiating R&D institute is licensed as a business unit by some regulatory authority, but remains an integrated part of the R&D institution. “This form of spinning-off usually starts with the aim of creating profitable business based on institutional strength to supplement institute income.”(ibid)

According to Gu’s observation and survey, this form of spinning-off was not very common and only academically strong R&D institutes were able to take this form without compromising their academic quality.

Gu’s observation is the starting point for further exploration. His method of classifying the forms of ‘spinning-off’, as he suggests, encountered difficulties in defining the mixed form of spinning-off enterprise. He discovered that the boundaries between these three forms were actually ambiguous and that ambiguity was more likely to be found between forms 1 and 3.

6.1.2 Two-type format

Based on partially Gu's classification, this research will employ a simplified 'two-type format' in order to identify forms of ownership and property rights of high-tech spin-offs more clearly at start-up process. With reliance on both text-based research and direct observation of key cases, this study proposes a hypothesis to explore factors that decide the initial form of spinning-off being taken. The exploration will focus on the initial formation of property rights and ownership of high-tech spin-offs.

This research employs cases of high-tech spin-offs in the Beijing High-tech Test Zone, examines spin-offs of leading universities to provide a contextual argument and then focuses on the case of Huazhong University of Science and Technology for an in-depth discussion.

Type 1: 'Unit'-based spinning-off: enterprises associated with a supervising unit
(*you zhuban danwei*)

In this type, enterprises spun-off within the organisational and managerial structure of R&D institutions, either indirectly, through retaining some of the organisational structures inherited from the 'mother' institution (*danwei*), or directly, remaining an integrated part of R&D institution. These types of spin-offs were usually registered as either state-owned or as collectively owned with the R&D institutions as the ultimate owners.

This type of spinning-off emphasized technology diffusion within the extant system. It resulted in two kinds of enterprises. The first were new high-tech companies *exclusively* established and operated by R&D institutions as either new 'units' or attached 'units'. The second were enterprises jointly founded by R&D institutions, other state-owned enterprises (SOEs) and state agencies. In the latter cases, the nature of the new companies was the result of negotiation among investing sides .

Type2: ‘Non-Unit’-based spinning-off: enterprises without a supervising work unit (*wu zhuban danwei*)

Compared with the first type, this type of spinning-off was associated with ‘organisational creation’. It was a process in which individual scientists combined their knowledge and know-how, their *social capital*, to establish new high-tech companies without any formal organisational involvement from their former R&D institutions.

In addition to the spinning-off process *per se*, another aspect relevant to the nature of spin-off enterprises relates to the nature of the creators initiating the enterprise. There were two types of initiators - individual and organisational initiators.

Universities, R&D institutions, their cooperating partners in the enterprises (SOEs, TVEs, Joint Ventures) and state agencies were classified as the organisational initiators. Organisational initiators were the major force for initiating high-tech spin-offs. According to Chen Zhaoying *et al* (1992, p.155), in the year 1989 – 1990, 80% of high-tech spin-offs were initiated in this form. Spin-offs initiated by the R&D institutions and universities accounted for 48% and 52% of the total in 1989 and 1990 respectively (*ibid*).

As organisational initiators, the R&D institutions created new high-tech spin-offs in two ways. First, R&D institutions provided significant initial investment both in the form of productive factors including capital, fixed assets, skilled labour and in the form of the institutions’ prestige and creditability, thereby assisting new spin-offs to obtain any benefits of government policies. The other contribution was to allow the spin-off enterprise ‘use rights’ of the technological assets, which were officially public property belonging to the R&D institutions.

6.2 Hypothesis

$$g(\text{form}) = f(\text{resource allocation}) \quad (6.1)$$

In hypothesis 6.1, it is argued that the *form* of spinning-off adopted was dependent on how initiators got access to the resources they needed for the start-up of business. The problems associated with ambiguous property rights were embedded in both type I and type II spin-offs, although Type II involved more ambiguity in terms of ownership at the start-up stage. This research argues that it was the underdeveloped market institutions *embedded* at the early stage of transition, particularly the lack of factor markets and insufficient resource allocation mechanisms that compounded the problems of ambiguous property rights and ownership associated with newly established high-tech spin-offs.

6.2.1 The problems of Type I spinning-off

Firstly, this thesis examines problems associated with Type I high-tech spinning-off. By the middle of the 1980s, the reform of the Chinese economy stepped into a transitional period between the two economic systems. The ‘dual-track’⁷ system was implemented through the 1980s and early 1990s. The adoption of a ‘dual-track’ approach preserved a level of political stability and ideological commitment at the same time as enabling reformers to bypass ideological constraints and pursue the pragmatic task of fostering economic growth.

⁷ ‘Dual-track’: the market was brought in as a supplementary track to that of the plan alone.

Table 6.1 Summary of reform policies and major breakthroughs in the 1980s

Period	Reform Policies
1981-82	Economic Responsibility System
1983	' <i>Li gai shui</i> ' - substituted tax payments for profit remittances
1986	Most newly hired workers in SOEs were given fixed-term, usually three-year, contracts intended to put an end to the 'iron rice bowl' system
1987	Performance contracts' - contract responsibility system'
From mid 1980s to 1992	Additional autonomy granted to SOE managers: the rights to make production decisions, negotiate prices for outputs and inputs, purchase goods and materials, make investment decisions, hire workers, and determine wages and bonuses.

The underlying objectives of 'dual-track' policies implemented throughout 1980s were to introduce market forces and incentives to the *extant* state-owned industrial sectors in order to enhance the efficiency of the state sector. The majority of the high-tech enterprises were not *extant* industrial organisations but businesses newly formed in the 1980s. As the 'dual-track' was the new norm of the 1980s, unlike the traditional state-owned industrial organisations that were created with allocated resources within the state plan, high-tech spin-offs were born out of 'dual-track reform', in the sense that they received limited amounts of state planned resources yet were established with the status of an 'outside-plan unit' (*jihuawai danwei*). In term of the sources of resources, high-tech spin-offs had many features in common with TVEs which were established from scratch outside the plan. However, high-tech spin-offs fitted more closely with their patron (state-owned) institutions in the sense that the spin-offs were established with collectively accumulated intellectual property rights.

The *performance contract* reforms of the early 1980s introduced market incentives by allowing firms to retain profits after tax. State agents and SOEs were allowed to retain extra profits and as a result the capital raised by the enterprises themselves accumulated. This retained capital was categorised as '*jihua wai zijin*' (capital outside the plan). In theory, it belonged to the state, in practice, the enterprises had *de*

facto control of self-retained capital and managers' *took* rights to decide how much to retain and how to use them.

R&D institutions and universities, classified as state public utility units (*shiye danwei*), also adopted reform schemes that were aligned with the *performance contracts* policies implemented in state enterprise units (*qiye danwei*), especially after the announcement of the "Decision on the reform of Science & Technology System" in 1985. According to the decision, governments funds granted for R&D were to be gradually diminished and that a technology market was to be created. In order to cross the 'river' from the bank of 'rigid planned government funded R&D system' to the other side of the market mechanism, 'stones' were necessary to facilitate the unknown journey full of uncertainties. To test the 'depth of the water', R&D institutions and universities started by laying the 'stone' of encouraging employees to generate additional income from the market by setting up high-tech spin-offs with retained capital.

For Type I spinning-off, 'mother' units either directly invested or gave permission to use this capital as start-up support for initial spin-offs. Because of the practical and utilitarian 'can-do' attitude at the initial stage of the development high-tech spin-offs, the focus was on how to generate more incomes with *available* resources, while the question regarding the ownership of resources employed for the purpose was often left untouched. As a result, the rights and responsibilities associated with the nature of resources were not defined either.

The debate over the nature of retained capital and other resources employed for the start-up of the high-tech spin-offs remained unsettled from the start-up stage and such ambiguity induced more sophisticated problems of property rights and ownership later on. As the economy was growing so fast, trivial disagreements over the entitlements of rights and the distribution of benefits at the start-up stage in many cases grew so dramatically that interested groups were deadlocked and the struggle threatened the further development of the business.⁸

⁸ For instance, the ongoing property rights disputes between the Founder Group and its original mother 'unit' – Beijing University – is a typical case of such kind problem. This research will discuss it in details in Chapter 7.

6.2.2 The problem of Type II spinning-off

Secondly, the research observes the problem associated with Type II spinning-off. In addition to 'soft resources' - technology and know-how – that embedded in manpower, enterprise creator also need 'hard resources' – production factors of fixed assets, capital and labour – to initiate the business. However, in the 1980s, most people could not afford 'hard resources' that required to start business themselves. In terms of public funding, it was difficult, if not impossible, for individual to acquire resources from the rigid state planned resource allocation system. On the other hand, the re-introduced market allocation force was limited and weak in the sense that production factors markets were not yet available for people to seek hard resources or to trade their soft resources.

In order to solve the shortage of resources due to the constraint of underdeveloped production factors markets, initiators of Type II high-tech spin-offs attempted to seek 'hard resource' that 'left unused' from other state agents or institutions through their social networks. The 'left unused resources' were those resources allocated to 'units' within the plan but left unused and state agencies (leaders and managers of state 'units') were entitled to rights of use of these resources within their rein of power. On one aspect, these resources were officially classified as either state-owned or collectively owned. According to the principle of 'the one who invests in the company is entitled the ownership', the high-tech spin-offs that absorbed public resources should be classified as if not state-owned, at least collectively owned, which often have designated 'unit' status. On the other hand, the organisational and managerial arrangements of the new high-tech spin-offs were completely different to the structure of traditional state-owned and collectively owned business, but fit better in the category of 'individual business', in the sense that the company was registered as an 'independent company' without any official attachment to any 'unit', and the *de facto* control of the company was not in the hands of any line bureau or public institutions but in the hand of individual initiators. The high-tech spin-offs formed with 'left used' public resources and registered as independent business did not have 'unit' status, it was the creators' choice whether to be classified as 'individual business' or 'collective business without unit status'. At early stage, the majority of business creators chose

the more ambiguous 'label' of non-unit collective than the 'individual status' that fit more appropriately to their real status.

For these companies, their choices of officially registered type were dependent on the initiators '*entrepreneurial alertness*'⁹ of opportunities in the markets embedded within the society of transition, and their awareness of risks and costs of rejecting 'unit' status, given the fact that being an individual business was regarded as 'outside the box' of the game.

To support the argument expressed in hypothesis 6.1 - the form of spinning-off that was taken was dependent on how initiators got access to the resources they needed for the start of business – and to elaborate the institutional change of property rights of high-tech spin-offs at the start-up stage, the research will observe and examine the contextual cases of high-tech spin-offs based in the Beijing High-tech Test Zone in the section 6.3 and key cases of the selected university high-tech spin-offs in the section 6.4.

6.3 Spinning-off: the case of the Beijing High-tech Test Zone

It is constructive for this research to study the ownership structure of high-tech spin-offs at the start-up stage in the Beijing High-tech Development Test Zone (hereafter referred to as Beijing Zone). Beijing Zone was the first officially approved Science Park in China and has been used as the pilot case of S&T restructuring. There are many reasons why the decision makers selected Beijing Zone as the pilot case. Firstly, the largest cluster of universities and R&D institutions are based in Beijing. The most innovative R&D institutions of China, such as Qinghua University, Beijing University, and Chinese Academy of Science are all located in the district known as Zhong Guancun in Beijing. These top R&D institutions were privileged recipients of allocated R&D resources under the planned system. They had accumulated the most significant R&D strength under the plan. Secondly, based in Beijing, leading scientists from these institutions have closer contact with the central leadership, and

⁹ The concept is borrowed from Kirzner (1985), please see a detailed discussion in 6.3

their lobbying of the decision makers was crucial for the formation of R&D reform policies. As indicated in the previous discussion, the 863 Program was proposed by three leading scientists from R&D institutions in Beijing to the reform leaders. Thirdly, scientists from Beijing R&D institutions had more opportunities to get access to new knowledge and were provided with chances to creatively borrow foreign experience. As indicated in Table 6.2, at an early stage, most new high-tech enterprises in China were located in the Beijing Zone.

Table 6.2 Growth of High-tech Zones and New Technology Enterprises

Year	No. of NTEs in Zones		No. of Zones
	Total	Beijing Zone	
1983		11	
1984		40	
1985		90	
1986		100	
1987		148	
1988		527	1
1989	1,704	974	26
1990	1,690	1,343	36 (27)
1991	2,743	2,442	39 (27)
1992			
1993	10,000	3,000	(52)

(Sources: Gu Shulin, 1994, p.10. Number in brackets are number of zones that were approved by SSTC as 'national level zone'.)

Figure 6.1 Number of NTEs in Beijing Zone and Total number of NTEs in High-tech Zones in China: 1983 – 1993

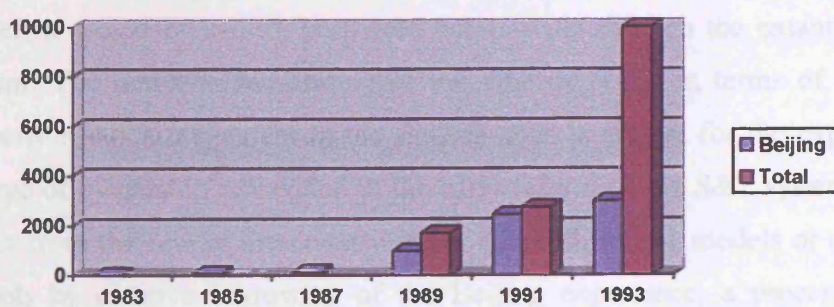
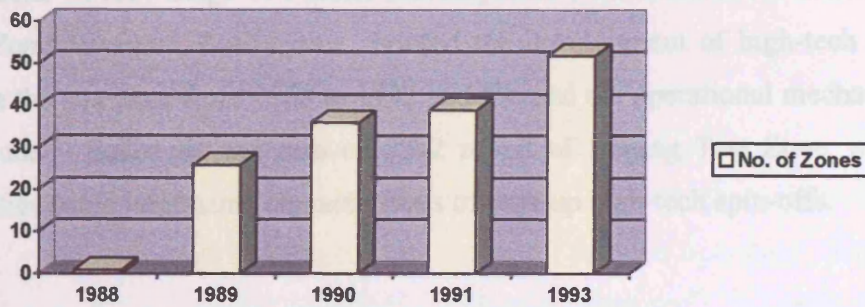


Figure 6.2 Number of High-tech Zones in China: 1988 – 1993



Sources of Figure 6.1 & 6.2: compiled by the author with data in Table 6.1

Figure 6.1 & 6.2 indicate the phenomenon that this research wishes to identify as ‘movementlised growth’ (*yundong hua zengzhang*). There was a ‘great leap forward’ in terms of the significant increase of number of both NTEs and High-tech Development Zones in China in the short period from 1989 to 1993. The fast establishment of High-tech Development Zones across China was by and large a government-led movement with reliance on public resources (Weng Tiejun, 2003). Following the model of NTEs in the Beijing Zone, a large number of NTEs were set up in other high-tech zones after 1989. The increase was dramatic in the sense that in 1991, NTEs in the Beijing Zone accounted for 89% of total NTEs in high-tech zones across China; by contrast, NTEs in the Beijing Zone only accounted for 30% of the total in 1993. It is obvious that the Beijing Zone was used as the first ‘stone’ to test the depth of water, and once the decision makers accepted and approved the tested model, it would be swiftly promoted nation-wide through the extant administrative system. The better understanding of the type of NTEs in terms of ownership and property rights arrangement in the Beijing zone is crucial for the exploration of the change of ownership embedded in the early reform of the S&T system, because the NTEs from the rest of the country either adopted Beijing models or developed their models by creative borrowing of the Beijing experience, a process this research defines as the ‘following-up effect’.¹⁰

The *Beijing Test Zone Research Task Force* has conducted a series of researches and published 10 annual reports since 1992, the primary research method used has been

sample survey. In the first report conducted in April 1992 with the title of “Beijing Test Zone In the “Stage of Further Development”, the researchers from the *Beijing Test Zone Research Task Force* briefed the development of high-tech enterprises within the test zone from 1988 to 1992 and focused the operational mechanism of the test zone¹¹. Based on the data of 1992 report of Beijing Test Zone, my research identifies some interesting characteristics of start-up high-tech spin-offs.

6.3.1 Two stages of spinning-off - from commercialisation to industrialisation: mid 1980s -1992

General speaking, the development of innovative new technology-based enterprise involved two basic stages – (1) commercialisation of the technology or know-how, and (2) the realisation of industrial economies of scale. At the first stage of commercialisation, the task of the new enterprise was to develop technology and know-how into products or services that were ‘tradable’. At this stage, the main flow of income was generated through the sale of miscellaneous technological commodities (pilot products) and piecemeal transaction of technological consultancy and services. At this stage, the production of the enterprise had not reached optimum scale.

Some new technology based enterprises did not continue into the next stage and remained miscellaneous providers in the supply chain. This study suggests that the accomplishment of the first stage was a necessary but not sufficient condition of defining the successful completion of the spinning-off process. This occurred when new technology-based enterprises shifted the focus of enterprise activities from developing technology *per se* to the development of the scaled manufacturing of technology-based products. At this stage, high-tech enterprises were focused not only on establishing sufficient industrial but also on the establishment of organisational

¹⁰ In the fieldwork with key high-tech spin-offs of Huazhong University of Science & Technology, the interviewees mentioned the ‘following-up effect’, which was an important stage for them to start their business by learning from experience of Beijing NTEs.

¹¹ The objectives of the report were, firstly, to evaluate the performances of the enterprises; secondly, to identify the conflicts that had challenged the enterprises and the administrative authorities of the test zone in the past and the ongoing problems they would encounter; thirdly, to generate innovative development policy regarding the identified problems and new challenges and therefore to facilitate the further development of the test zone.

structures for marketing & sales systems. Income, at this stage, were increasingly generated from the sale of mass manufactured industrial products, and commercial activities that supported this sale.

With regard to the spinning-off process of new technology-based enterprises in China, the first stage started in the early 1980s in two main forms. One major form was to 'transfer technology into products' through 'horizontal co-operation' (*hengxiang he zuo*) with other state-owned agencies or collective institutes¹². The other form was to establish individually-oriented consultancy and service companies that were informally linked with state-owned R&D units and other state agencies. The first (officially recorded) new technology-based enterprise, initiated by Professor Chen Chunxian in 1980 was, a technological consultancy company that had informal but close contact with the Physics Department of the Chinese Academy of Science.

As indicated in Table 6.1, in 1983 there were only 11 registered New Technology-based Enterprises (NTEs) in Beijing, but by 1987 the number of NTEs had increased to 148. The number of NTEs further increased to 527 in 1988, an annual growth rate of 256%. From 1988 to 1992, the number of NTEs increased at an average rate of roughly 100% annually and went over 3,000 by 1992.

In this research, 1988 is considered the 'watershed' between the two stages in the initial development of NTEs in China through 1980s and early 1990s. Before 1988, NTEs, starting from scratch in China, were at the first stage of spinning-off and their activities focused on developing technology into commercial products. The NTEs that survived¹³ with accumulated resources entered the second stage with a fundamental change of both technological and commercial activities and new industrial clusters thereafter formed accordingly. It was the industrialisation transformation at the second stage that determined the outcome of the spinning-off process. Unlike their 'mother' institutions, most new technology-based enterprises were created with outside-plan resources and adopted new organisational and management structures by introducing market mechanisms. The new technology-based enterprises faced more rigid budget

¹² In the following section, there will be a detailed description of this form.

¹³ The first NTEs created by Professor Chen Chunxian, *Huaxia Silicon Information Co.* did not survive and was listed on the category of 'yellow card warning' NTEs in Beijing Zone in 1991.

constraints compared with traditional state units and in the spinning-off process, either survived market pressure and evolved into larger enterprises or collapsed.

The end of the 1980s to the early 1990s was a transitory period for the development of new high-tech industries. After a decade of development from scratch, with the growing number of NTEs that completed the industrialisation stage, new industrial clusters began to form. As the two-staged spinning-off was a dynamic process, the implementation of further 'reform and open' policy and the formation of industrial clusters induced demands for new products and raised more opportunities for miscellaneous suppliers to enter the supply chain, thus creating opportunities for new spin-offs. The statistics of Table 6.1 shows the robust increase in the number of registered NTEs after 1988, suggesting that the government's new high-tech policies and the initial formation of new industrial cluster provided opportunities for a further round of spinning-off.

At the initial stage of the development of NTEs, most enterprises engaged merely in trading and the installation of high-tech products was mainly developed by foreign companies. Through the accumulation of revenue generated from the sale of miscellaneous technological commodities and the provision of consultancy and services, some NTEs raised the 'first bucket of gold' and entered into a new stage of industrial development.

In the transitory period, the NTEs entering the industrialisation stage underwent fundamental changes regarding the nature and contents of their technological and commercial activities. Firstly, the scale of their commercial activities enlarged significantly and the share of revenue generated through the sale of self-developed products¹⁴ gradually increased often exceeding the share of revenue generated through trading and assembling imported products. Table 6.3 shows that by 1991, among 6 NTEs whose total output value exceeded 100 million yuan, 3 companies' Industry Output Value exceeded 100 million yuan implying that the larger sized NTEs increasingly engaged in industrial manufacturing, although trading and other services remained major channels of income. Table 6.4 shows a robust increase in the share of

¹⁴ *zichan* products is referred to products that are developed by NTEs' own R&D systems and manufactured at NTEs sites.

Self-developed Products (SDP) in overall NTE activities during this period. The number of SDPs doubled in two years from 1989 to 1991 and the revenue generated from the sale of SDPs accounted for 40.65% of total revenue in 1991, a significantly increase compared with that of 25.82% in 1989. The figures demonstrate that NTEs engaged in SDP industrial manufacturing gradually took over from those NTEs merely engaged in trading.

Table 6.3 No. of Enterprises whose total industrial output value exceeded 5 million yuan, 10 million yuan and 100 million yuan in 1991 in the Beijing Test Zone

5 m		10 m		100 m	
Total	Industrial	Total	Industrial	Total	Industrial
145	44	71	18	6	3

Table 6.4: Share of Self-developed Products (SDP) in the Beijing Test Zone

	No. of Self-developed Products & Industrial Output Value (million yuan) & annual growth rate	Sale of SDP (billion yuan) & Share of SDP of total sale revenue (%)
1989	60 (520 m)	0.46 billion (25.82%)
1990	84 (880 m) 48.33%	
1991	120 (1.08 billion) 25.9%	1.504 billion (40.65%)

Secondly, market selection led to sharp divisions among early established NTEs in this period. While some NTEs grew progressively, others encountered difficulties and were on the point of closure. In this period, the performance of larger sized NTEs was comparatively stable.

Thirdly, the accumulated monetary capital of NTEs and NTEs investment in the R&D of SDP reached historically high levels in this period. By the end of 1991, the total amount of accumulated monetary capital of NTEs in the Beijing Test Zone was 450 million yuan, a 50% increase from 1990. At the same time, the net value of fixed assets and investment in property and other infrastructure of NTEs increased by 79% and 164% in 1990 and 1991. Besides self accumulated investment capability, there was growing amount of the National Support Funds that were channelled into NTEs to support the R&D of SDPs. Received National Support Funds reached 97 million

yuan in the Beijing Test Zone in 1991, a rise of 80% from that of 1990¹⁵. Compared with the scale of self-accumulated capital of NTEs in the Beijing Zone, the amount of government funds was roughly a quarter of those defined as ‘self-raised’¹⁶.

The above changes suggest that after 10 years development, the most successful of the first generation of NTEs were those (1) with accumulated resources from initial development and (2) which had shifted from miscellaneous products and services into production, relying more on SDPs. In the following Box 6.1, the story of the initial development of NTEs in computing industry gives a good example of the change identified.

Box 6.1 The case of ‘Secondary R&D’ in computing science NTEs in the Beijing Zone

In the Beijing Test Zone, 48.6% of registered NTEs were in the fields of computing science and electronic engineering in 1991. Most of these NTEs were established in the mid-late 1980s mainly by S&T staff from state-owned R&D institutes that are located in the district of Zhong GuanCun. Regardless of the different forms of spinning-off that were taken and the different property rights arrangements, these enterprise had similar experience at the first stage of the spinning-off process.

The companies engaged in computing science and electronic engineering started their commercial ventures by assembling, selling and providing after sale services for imported PCs and other relevant products. In this initial period, these enterprises focused on promoting imported high-tech products into the Chinese market. The main activity of these enterprises were to get hold of imported goods (import quotas from the government) and then to set up ‘sale networks’ for the efficient selling either ‘original imported’ (*yuanzhuang jinkou*) or ‘assembled imported’ (*jinkou zuzhuang*) goods. Individual know-how was the key soft resource that was required for the establishment of this kind of enterprises.

These enterprises were linked with state R&D institutes. Most individual initiators of these enterprises were staff of state R&D institutes and often began their business with contracts granted by the R&D institute they were serving. One well-known case in the field was Stone

¹⁵ Torch Program officially started in 1988 and the Torch funds were accounted for a large share of this sharp rise.

¹⁶ ‘Self-raised’ is not equivalent to ‘individual’ or ‘private raised’ in this context. It refers to the kind of resource that was not allocated according to the plan. SOEs and state agencies were allowed to retain ‘self-raised’ profits as the result of reform through early and middle 1980s. These resources were defined as ‘state owned public property’ in terms of ownership; however the right of control (the right

whose first contract was to assemble and install imported PCs for the Chinese Academy of Science. The essence of such a contract was not different from the PPP (public-private-partnership) arrangement in the west. Since in the Chinese context of the 1980s, 'collective' enterprise was more acceptable than 'private' enterprise due to ideological constraints, it is better understood as *PCP (public-collective-partnership)*.

Besides trading imported PCs, some enterprises added their own by-products compatible with imported PCs. This process was identified as the common feature of 'secondary R&D' at the first stage of spinning-off. One of the present IT giants in China, Legend, went through the 'secondary R&D' at initial stage by incorporating self-developed a *Chinese Character Processing System* into the PCs they assembled with imported technology and spare parts and then sold them through the national-wide sales networks. Thereafter, Legend moved forward quickly into the further stage of industrialisation becoming a 'legend' as 'national champion' in the computing and IT industry.

Legend, established in 1984 with 40 S&T staff from the Institute of Computer Technology of the Chinese Academy of Science, was the leading brand of complete PCs of all ranges (from 285 to 484) in the China market in late 1980s and early 1990s. Their dominance of the domestic market relied on comprehensive competence of combining their established 'sales networks' with self-developed patent granted products and highly disciplined cheap skilled labour. The strategic decisions based on proper identification of its position in the supply chain and its competitive edge on the world market were crucial determinant factors of their success.

(Sources: translated from the Chinese text: Liu Chuanzhi, 'Establishing a computer industry competitive on the world market', in Science and Technology in China. Beijing Test Zone Report 1992)

6.3.2 Organisational features and the development of ownership of high-tech spin-off in the Beijing Test Zone – a process of “embedded arbitrage”

6.3.2.1 The framework of analysis of embedded arbitrage

The development of R&D outcomes to industrial end users has taken four forms: the application *new* technology, the development of *new* products, the development of

of use) was in the hands of managers of SOEs and state agencies. Government funds, in this context, are resources allocated within the plan.

new processing techniques and the application of *new* materials. Depending on the nature of the technology and relevant spinning-off products, there were three basic methods adopted to diffuse technology in China at that time.

The first method was that of the transfer of technology *per se*, R&D institutions and spin-off enterprises merely sold the technology and know-how to industrial users¹⁷ or applied their knowledge and know-how to commercial products directly.

The second method was diffusion via cooperative processing. High-tech spin-off enterprises held the core technology but placed orders with other enterprises (mainly SOEs and TVEs in the late 1980s) for the processing of (new) materials or manufacturing of (new) products with the application of (new) technology and industrial knowhow.

The third method went beyond mere technological and manufacturing cooperation and was characterised by the ceding of equity to establish joint enterprise between R&D institutions, high-tech spin-off and other enterprises, mainly state-owned units at the time.

As discussed above, at the early stage of spinning-off – the commercialisation stage – the major method of technology diffusion was the transfer of technology *per se*; the methods of diffusion via cooperative processing and joint enterprise were applied at the second – industrialisation - stage. The case in Box 6.1 clearly indicates the evolution of the spinning-off process and the change in the manner of technological diffusion associated with it.

The different methods taken revealed opportunities and incentives associated with the property rights arrangement and ownership structure of the spin-off enterprises. The spin-offs at the commercialisation stage adopting the method of transferring technology *per se* were often registered as individual business or non-unit based collectives. The spin-offs at the industrialisation stage engaged in more sophisticated

¹⁷ Formal laws and institutions (i.e. technology market) were non-existent at the time. Informal negotiations and bargaining between the buyers and sellers following common sense and accepted norms were the methods of the time for the 'transfer' of technology (*jishu zhuanran*).

methods of technology diffusion demanded more resources and therefore faced the challenge of 'resource constraints' at the time.

At these different development stages, spin-offs adopted various types of property rights arrangements and ownership structures. The ideological shifts and political relaxation in the early 1980s allowed the diversification of ownership and a challenge to state ownership: the 'new' high-tech sector established in the 1980s, mainly in the form of spin-off NTEs at the enterprise level, adopted diversified ownership structures and property rights arrangements.

As indicated in Table 6.5, there were four categories of NTEs in Beijing Test Zone from 1988-1991: *State owned*, *Collectively owned*, *Cooperatively owned* and *Foreign-Joint owned Ventures*. There were two sub-categories of collectively owned enterprises, one classified as 'unit,' referring to those attached to official 'units' (*danwei*) and the other classified as 'non-unit', referring to those independent of 'units'.

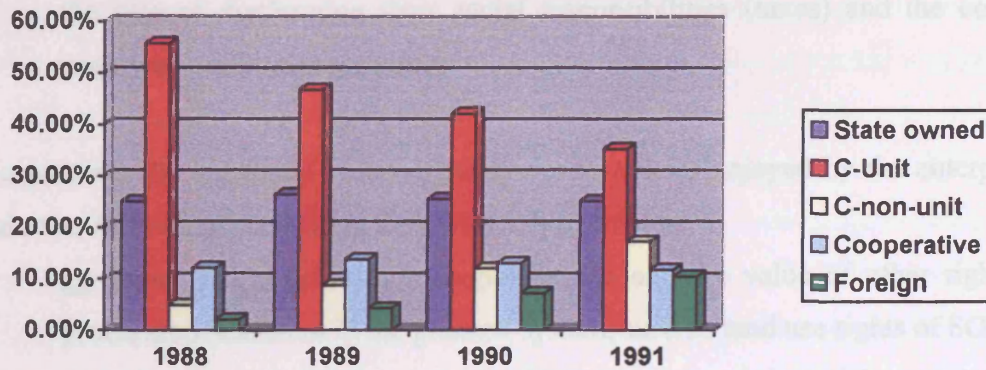
Table 6.5: The ownership structure of NTEs in Beijing Test Zone from 1988 – 1991:

		1988	1989	1990	1991
State owned		132	225	249	338
Collectively owned	Unit	294	398	411	475
	Non Unit	26	74	117	232
Cooperative		64	117	127	158
Foreign JV		11	36	70	140
Total		527	850	974	1343

Table 6.6: The ownership structure in percentage of NTEs in Beijing Test Zone from 1988 – 1991

		1988	1989	1990	1991
State owned		25.05%	26.47%	25.56%	25.17%
Collectively Owned	Unit	55.78%	46.82%	42.2%	35.37%
	Non-Unit	4.9%	8.7%	12.01%	17.27%
Cooperative		12.14%	13.76%	13.04%	11.76%
Foreign related		2.08%	4.24%	7.2%	10.42%

Figure 6.3 The ownership structure in percentage of NTEs in Beijing Test Zone from 1988 – 1991



What were the boundaries between different categories? Under what circumstances did high-tech spin-off enterprises adopt different ownership and property rights arrangements? What were the incentives and constraints behind their decisions? How were they identified, classified and registered ?

In order to address the above questions, this research uses the formula 6.2 to explain the factors that impacted on the adoption of various property rights arrangements and ownership structures of new high-tech spin-offs at the early stage.

$$P = I - C + B \quad (6.2)$$

P represents the benefits to the firm associated with high-tech development.

For the purpose of this research, P refers only to the *benefits associated with de facto rights of control* – the control of the cash flow is at the core of such benefits

I represents the expected *income* generated by new high-tech products.

C represents *costs* and comprises three elements:

C_s is the cost to SOEs of discharging their social responsibilities in the form of taxes paid to the state,¹⁸

C_c is the cost to collectively owned (unit based) enterprises of discharging their social responsibilities (taxes) and the cost of acquiring productive resources,

C_i is the cost to non-unit based collective and individual businesses outside the plan of discharging their social responsibilities (taxes) and the cost of acquiring productive resources

B represents the *beneficial value of preferential policies* enjoyed by the enterprises and other interests embedded in their ownership structure.

B_s refers to the value of intangible assets and the value of other rights to production resources in the planned system, such as land use rights of SOEs. It includes the *incentives* associated with autonomy and essential control of the company.

B_i refers to preferential tax policies and other benefits enjoyed by non-unit based collective and individual high-tech enterprises and foreign joint ventures, and more importantly, it includes the *incentives* associated with autonomy and essential control of the company.

B_c refers to preferential tax policies and other benefits enjoyed by collective (unit-based) high-tech enterprises and the *incentives* associated with autonomy and essential control of the company.

Following the above definitions, three basic formulae can be written as follows:

$$P_s = I - C_s + B_s \quad (1)$$

$$P_c = I - C_c + B_c \quad (2)$$

$$P_i = I - C_i + B_i \quad (3)$$

Formula (1) describes the expected benefits to a purely state-owned organisation of establishing a new high-tech enterprise, formula (2) describes such benefits to a collectively owned organisation and Formula (3) the benefits to a privately-owned organisation.

¹⁸In terms of the number of retirees and redundant workers to support and other social welfare expenses embedded in SOEs, and the income tax rate of SOEs was 55% at the time.

This research argues that *entrepreneurial alertness* goes far beyond the exploitation of perceived opportunities for instantaneous arbitrage¹⁹ in current markets. As indicated below, owing to the ‘dual track’ features of the underdeveloped market institutions, the different incentives and advantages granted to enterprises with different ownership structure and property rights arrangements and the trading of ‘exclusive rights’ and ‘special policy entitlements’ acted to some extent as informal market institutions facilitating exchange and reducing transaction costs. Under such circumstances, the arbitrage opportunities went beyond that of instantaneous arbitrage in the current market: the process of ownership diversification was conducted in ways that involved arbitrage opportunities over time.

Such opportunities have been a distinctive feature throughout China’s transitional market-oriented reforms. **This research argues that the creation of such opportunities has been a uniquely *creative process* for both state and non-state enterprises, transforming the ‘obstacles’ of government regulations into opportunities.** With regard to the state sector, “the process (took) the form of breaking up existing enterprise to form ‘secondary legal entities’ (or subsidiaries), often disguised as collectives; joint ventures with foreign and/or domestic partners; limited liability companies; and joint stock companies. This has been one way for SOE managers to gain further autonomy from supervising government agencies”(Broadman 2001). With regard to the non-state sectors, it provided an opportunity for individual entrepreneurs to acquire cheap resources for tomorrow’s markets via marriage with the state sector, the outcome depending on embedded ‘entrepreneurial alertness’ of market opportunities.

¹⁹ According to the Austrian school, Mises (1949), as Kirzner (1982) explained, viewed the market as a “process.” But what kind of a process is it? Kirzner has emphasized that it is a process of *entrepreneurial alertness*. Kirzner concludes that the satisfaction of consumer demand may be the purpose behind production, but there must be some who, in the social system of division of labour, have the specialized role of anticipating what it is that consumers will desire in the future and then hiring, directing, and coordinating the use of the means of production towards that end. According to Kirzner, *entrepreneurial alertness* manifests itself in the perception of arbitrage opportunities, or of purely speculative opportunities, or of opportunities for technological or marketing innovation, it is this alertness that drives the corrective discovery process of the market.

In the following sections, we examine the ownership structure of NTE spin-offs and employ the basic formula 6.2 to demonstrate the evolution of ownership and property rights within these enterprises.

6.3.2.2 The analysis of state-owned NTEs

State-owned NTEs

As indicated in table 6.5, the share of registered state owned NTEs remained stable at roughly 25% of total NTEs from 1988 to 1991. State-owned NTEs were initiated and spun-off in various formats. First, with the reliance on accumulated R&D strength, the state-owned R&D institutions channelled part or all of their resources into the spin-off, its organisational structure remaining the same as its mother institution. Spin-offs from R&D institutions taking this form were referred to as institutions with the feature of ‘one institution, two mechanisms’ (*yitao banzi, liangkuai paizi*).

By the end of the 1980s and early 1990s, most universities and R&D institutions had adopted this management structure. As state owned R&D institutions, they maintained their position within the state administrative system and received allocated resources according to the ‘mechanism of the plan’. At the same time, they were allowed to establish spin-offs NTES with primarily ‘outside plan’ resources (*jihua wai zijin*). NTEs operated in the new business environment using more market –based instruments, while the government’s planning mechanism remained dominant in the operation of the mother insitutions.

R&D institutions adopted a new mechanism based on ‘four self principles’ (*sizi yuanze*) to direct the management of spin-off NTEs. The ‘four self principles’ included: *self-raised* capital and other resources; *self-organisation* (implying that NTEs had right to manage human resources, appointing and employing staff); *self-operation* (implying that NTEs had the rights of control of the company) and *self-responsibility* (implying that NTEs had right to enjoy any return on capital while being responsible for any losses).

The mainstream ‘official’ theory of the time emphasized the ‘separation of the right of ownership and the right of management and operation’ (*su you quan he jinyin quan feng kai*). Aligned with the official line, the institutional innovation of ‘one institution, two mechanisms’ allowed the spin-off NTEs to remain ‘publicly-owned’, while at the same time, granting the managers of spin-offs the rights of operation. As a result, the nominal ownership and the *de facto* control of the spin-offs were separated. Thus the ‘four self principles’ preserved the old ideological commitments on the new journey of pursuing growth and efficiency in the high-tech sector. The experience of Taichi Computing Co., explained in Box 6.2, illustrates how the ‘one institution, two mechanisms’ policy worked.

Box 6.2 The case of Taichi Computing Co.: ‘one institution, two mechanisms’

Taichi Computing Co., was directly established by HuaBei Institute of Computing (the No.15 Institute of the Ministry of Mechanic Electronic Engineering). As a state-owned R&D institute, it had the status of state ‘institution unit’ (*shiye danwei*), undertook key national R&D projects in the period of both the 7th and 8th five-year-plans and therefore received government financial and fiscal support and resources allocated within the plan. The official status of state ‘institution unit’ is the ‘one mechanism’ of this institution with the name HuaBei Institute of Computing or No. 15 Institute. At the same time, the same institution engaged in mass manufacturing mini-computing machines and was the only supplier of such high-tech products in China. The ‘other mechanism’ of the institution which was used to describe its industrial and commercial activities was named the Taichi Computing Co.

The operation and management of the Taichi Computing Co. was undertaken according to market principles. However, the official ‘unit’ administrative structure remained unchanged as the institution still held its official title. The case of Taichi represented the efforts of state agencies to apply R&D strength directly into commercial products. It was a trial to link up the ‘plan’ and the ‘market’: apart from a portion of guaranteed government purchases within the plan, Taichi had to ‘jump into the sea of business’ relying on the company’s marketing and sales network to promote its products.

The ownership and property rights arrangements of this type of state-owned NTEs was clear and the classification and registration of this type of NTE did not raise any confusion. However, this form was not dominant given the resources and institutional constraints that most state R&D institutions encountered at that time.

The 'one institution, two mechanisms' structure was crucial for the initial success of spin-off NTEs. However, it has also created a web of new problems, mainly because the rights of residual were left unaddressed from the start-up of the business. Spin-off NTEs expanded significantly in a comparatively short period in a fast changing transitional environment. New methods of operation and management, such as the acquisition & mergers with mixed ownership enterprises, were introduced and adopted in spin-off NTEs. The new methods involved a substantial change of ownership and property rights arrangements. As a result, the unaddressed problems associated with the ambiguity of residual rights became more complex and more difficult to resolve.

Second, R&D institutes diffused technologies and knowhow through the second and the third diffusion methods as identified above, diffusion via cooperative processing and by establishing Joint enterprises. If the cooperative partners and acquired resources embedded in either method involved mainly state-owned partners and public resources, the spin-off NTEs would be officially defined and classified as state-owned as well.

Although the non-state industrial sectors developed significantly, SOEs remained key economic players in terms of their contribution to GDP and overall social welfare throughout the 1980s and early 1990s. One of the policies aimed at improving the performance of SOEs emphasised the diffusion of new high-tech into traditional industries. The objective of the strategy was to upgrade the products in traditional industries with new high technology and to strengthen the competitiveness of SOEs.

As a result, SOEs were major receivers of diffused technology and became important business partners with spin-off NTEs. In a survey conducted by the Beijing municipal Science & Technology department in 1991 based on the data of 50 top NTEs in Beijing, it was shown that 65% of their total new technology and know-how was channelled into the medium and large sized SOEs. The cooperation between larger SOEs and smaller sized high-tech spin-offs was the major channel of technology diffusion through which the strength of the large SOEs, derived from their access to hard resources and their entitlements to prior policies, and the technological strength of spin-off NTEs were integrated accordingly.

Table 6.7: The Nature of Joint NTEs

Co-operation	Outcomes
A. SOEs + Collective NTEs	Collective NTEs
B. SOEs + Collective NTEs (non-unit based)	Collective NTEs (unit based)
C. SOEs + Individual NTEs	Collective NTEs (unit, non-unit based)
D. SOEs + State owned NTEs (mainly state Owned R&D institutions, Universities)	Collective NTEs in terms of <i>de facto</i> control

The bringing together of their resources by SOE managers and the spin-off NTE entrepreneurs to maximise industrial benefits was a *creative* process. In the case of type A and B co-operation indicated in table 6.7, the jointly established collective NTEs did not bear the social responsibility costs of the ‘mother’ SOE, but merely shouldered these of the collective enterprise significantly less than those of SOEs. Meanwhile they were able to get access to hard resources and other intangible assets from the SOE side, and therefore were able to reduce the cost of acquiring productive resources. Furthermore, they were also entitled to preferential tax policies and other benefits enjoyed only by the collective NTEs. The last, but not least benefit to SOEs agents was the additional autonomy and greater control through the operation of joint collective NTEs. The outcome of type A and B partnerships can be described in the formula 6.2.1:

$$P_s + P_c = I - Cc_0 + B_s + B_c + B_{s0} \quad (6.2.1)$$

In which Cc_0 refers to costs under the new form of organisation which were frequently less than both C_s and C_c . B_{s0} refers to additional autonomy and essential control to which purely state owned NTEs were not entitled.

In the case of type C partnership indicated in table 6.7, the outcome was similar to that of cases A and B and can be demonstrated in formula 6.2.2

$$P_s + P_i = I - C_i_0 + B_s + B_i_0 + B_{s0} \quad (6.2.2)$$

in which $Ci0$ and $Bi0$ refer to costs and benefits of the new organisation respectively which were less than Ci and Bi . It demonstrates the rationale behind the strategic decision of individual entrepreneurs to cede equity and the associated rights of control to SOEs for the purpose of acquiring resources and other intangible assets. It also demonstrates the motives behind the choice of the SOEs' agents to establish joint NTEs instead of setting up sole ownership NTEs. The higher the Ci , the more it would be possible for individual entrepreneurs to choose the strategy of swapping part of Bi for the expected higher market returns.

In these cases, the SOE agents would get $Bs0$, the additional autonomy and more rights of control - most crucially the *de facto* control of cash flows - the key incentives for choosing joint co-operation. The agents' pursuit of $Bs0$ either for the benefits of the unit or for individually vested interests involved the question of 'grey incomes', itself involving the problem of arbitrage. The case explained in Box 6.3 illustrates the problem of arbitrage.

Box 6.3 The case of the New Special Vacuum Technology Development Co.

The New Special Vacuum Technology Development Co. (NSVT) was a NTE jointly created by Beijing Instrument General Company (a regional SOE) and the Vacuum Tube Factory attached to the Chinese Academy of Science and registered in the Beijing Test Zone. The joint NTE designed and developed 19 new products in two years and the industrial output value reached 27 million *yuan*.

A significant part of the initial capital that was put into NSVT was classified as 'self-raised' capital. The new technology and new products developed by NSVT were not considered the property of the two 'mother' units, but of NSVT, registered simply as a 'joint enterprise' (*lianyin qiye*) in the zone.

NSVT transferred some of its technology and 10 new products to Beijing Instrument General Company (BIGC) and assisted the old sluggish SOE to improve its efficiency according to the report. However, the transfer process was not open and the transfer agreement was not available to the public. How and how much did the 'mother' company, BIGC, as the initial investor of NSTV, pay for the transfer of technology and products that developed with BIGC investment remained a puzzle?

6.3.2.3 An analysis of collectively owned NTEs

The categories of collectively owned and cooperative NTEs

Only large R&D institutions that were better positioned under the plan were able to establish spin-off NTEs through the adoption of the new management structure of 'one institution, two mechanisms'. In Beijing, almost all leading R&D institutions had created spin-off NTEs by the end of the 1980s. For instance, the Chinese Academy of Science established 134 spin-off NTEs accounting for 10% of total NTEs in the Beijing Test Zone in 1990; among the top 50 NTEs in the zone in 1991, 16 (32%) were spin-offs of the Chinese Academy of Science.

The majority of small sized NTEs that spun-off from lower ranked R&D institutions relied primarily upon technology and know-how embedded in the initiators' manpower. They had to seek hard resources from other institutions, enterprises (resources both within and outside of the plan), or from individual groups and through foreign investment. Collective spin-off NTEs or individual NTEs often attempted to acquire hard resources through equity exchange.

NTEs: seeking cooperation with SOEs

Small-sized NTEs (consultancy companies or those engaged in miscellaneous production) were often short of hard capital. Larger sized SOEs enjoyed privilege in the planned resource allocation system, however their R&D sections were weak and often short of updated technology and new products. It was a win-win strategy to establish joint enterprise NTEs that combined strength of both sides. By the end of 1991, almost all major SOEs in Beijing had invested and established joint NTEs in the Beijing Test Zone with their total number reaching 107.

The nature of these kinds of joint NTEs changed frequently as they resulted from continuous negotiation and bargaining between involved partners depending on changing policy and circumstances. The lack of joint enterprises often registered as NTEs in a high-tech development zone and therefore were entitled to beneficial tariff and other preferential policies. Compared with the sluggish 'mother' SOE, which often took on heavy social responsibilities and suffered losses, the joint enterprise cast

off burdens and made profits with ease. Therefore there were motives, both political and economic for SOE officials to keep the profitable joint enterprise independent of the mother unit. In Box 6.4, the case of Huahai Co., gives an example of such phenomenon.

Box 6.4: The case of Huahai Co.: combining the strength of resources

Beijing Electronic Display Equipment Co (BEDEC), was a regional SOE specialising in manufacturing computer display units. As a state designated manufacturer, the company had built up quality manufacturing plants and obtained an advanced production line. Besides good quality fixed assets, the company also held a state production licence and an import quota for relevant spare parts. However, the R&D capacity of the company was weak, it was unable to develop updated products to compete and suffered growing deficits.

In 1989, this company established a joint NTE with Huahai Technology Co., a collective NTE. With the supply of hard resources, licence and quotas from BEDEC, the joint company engaged in producing a new product that was developed by Huahai Technology Co.,- HT-382 Chinese Character Display System. In the first year, the joint NTE sold out 800 units of the new system and generated profits of 18 m *yuan*.

In addition to seeking 'left unused' resources, small sized non-state owned spin-off NTEs also engaged in competing for new planned resources and projects to expand quickly. The new state plan increased the quota for high-tech development and more resources were available to NTEs in the high-tech development zones. In 1992, 19 projects from spin-off NTEs from the Beijing Test Zone were put on the list of the State Torch Program, and 14 production licences in electronic manufacturing and 40 production licences in medical equipment were issued to spin-off NTEs there. Large spin-off NTEs, such as Legend and Stone, were in the plan of several ministries as 'appointed manufacturers' (*dingdian*) for producing 'designated new high-tech products within the plan'.

New state resources favoured larger sized spin-off NTEs from top ranked R&D institutions. Most small sized NTEs were unable to acquire allocated state funds and loans such as from the Torch Programme were less likely to be involved in plans to undertake state projects and government purchase, and they encountered more

difficulties in obtaining licences and other quotas. Cooperation with SOEs or other state agencies however helped them overcome these problems. Meanwhile, officials from SOEs and state agencies expected that the new resources resulting from 'cooperative projects' with other institutions and firms would better serve their purposes than those available within the institutional boundaries of SOEs and state agencies.

Box 6.5 The case of Zhonghuan Bidding Technology Co.

Zhonghuan Bidding Technology Co. was registered as an individual NTE in the Beijing Test Zone. In addition to its unusual social capital, the company's technological strength lay in expertise in organising comprehensive construction projects. In the early 1990s, the company cooperated with various SOEs to bid for key state construction projects. The joint bids were strong and beat other domestic and international competitors in 8 projects out of the 10 they applied for.

As indicated in the above cases, regarding the registered nature of collective NTEs jointly established by SOEs and non-state-owned spin-off NTEs, the question was not whether to register the joint NTE as state-owned or collectively owned, but which form of joint NTEs would maximise the interests of the involved partners.

NTEs: Joint Enterprises with TVEs

In addition to SOEs and state agencies, spin-off NTEs also cooperated with the growing collective sector in China. After a decade of reform, the importance of the collective sector mainly represented by Township and Village Enterprises (TVEs) had increased significantly. In order to sustain further growth, TVEs resorted to new technology and industrial know-how to strengthen their competitiveness in the market. Their cooperation with R&D institutions was more flexible and less formal. The direct transfer of technology from individual technicians in R&D institutions to TVEs was a popular method of low-level technology diffusion²⁰. Other cooperative

²⁰ TVEs employed and paid technician as consultant. Individual researchers and technicians were allowed to work part-time off official working loads for other enterprises or institutions. This part of their income was addressed 'disguised income' (*yinxing shouru*) and most R&D institutions treated it as 'grey income' and left it untouched.

forms included establishing joint enterprises, cooperating in production and placing processing orders with each other. The rationale behind such partnerships is indicated in formula 6.2.3

$$P_c + P_{ctve} = I - C_{c0} + B_{c0} \quad (6.2.3)$$

Box 6.6: The Case of Haidian District

In Haidian district, Beijing, TVEs grew fast in the 1980s. A large number of universities and R&D institutions were also located in Haidian district. TVEs brought in intellectual resources from R&D institutions in the district and engaged in establishing new technology-based enterprises and producing technology intensive products. According to the survey, the cooperation between TVEs and high-tech NTEs was active in the district and by September 1991, there were 123 enterprises jointly established by TVEs and spin-off NTEs.

A TVE from Yuyuantan Village brought in talents and technology and created the Huayu Electronic Co. Ltd producing professional power equipment for programme-controlled telecommunication systems.

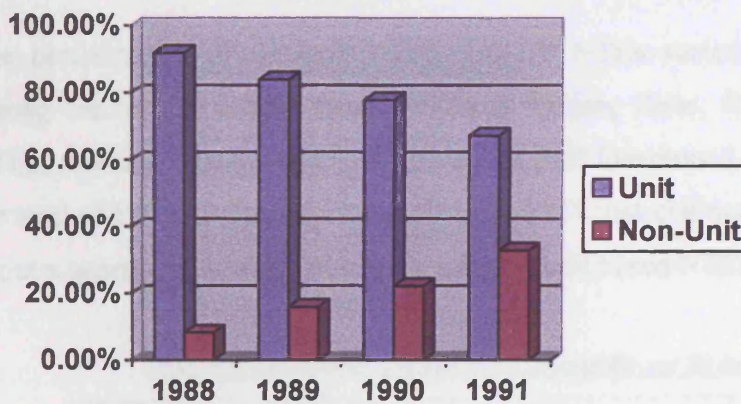
An interesting phenomenon: the increasing share of 'non-unit' based spin-off NTEs

Spin-off NTEs registered in the category of collectively owned enterprises accounted for roughly half of the total in the Beijing Test Zone (1988: 60%; 1989: 55%; 1990: 54%; 1991: 53%). There are two sub-categories of collective NTEs - those which were affiliated to the official 'units' (unit-based) and those independent of any 'units' (non-unit based). In the transitional period between 1988 to 1991, there was significant change in terms of the proportions of the two sub-categories of collective TVEs. According to the survey in Beijing, as indicated in Table 6.8, collective NTEs affiliated to official 'units' accounted for more than 90% of the total collectives in 1988, falling subsequently to 67.20% in 1991; indeed, significantly fewer collective NTEs claimed official administrative subordination to any official 'unit' in 1991 than they had in 1988.

Table 6.8: The ownership structure of the collectively owned high-tech enterprises

	1988	1989	1990	1991
Unit	91.88%	83.97%	77.84%	67.20%
Non-unit	8.2%	16.03%	22.20%	32.80%

Figure 6.4 The ownership structure of the collectively owned high-tech enterprises



In most 'non-unit based' spin-off NTEs, it was individuals or individual groups that invested the initial monetary capital at the start-up stage. Owing to ideological and institutional constraints, they were classified as 'collective enterprises' and registered as such. Some individual entrepreneurs made the strategic choice of registering as a collective, a phenomenon known as 'wearing a red hat' in China at the time. In most, if not all, official and semi-official surveys and statistical reports of the time, the category of 'private' had not yet been introduced. In order to differentiate this new type of 'collective enterprise' from the collectives embedding collective or public investment, the sub-category of 'non-unit based collective enterprises' (*wu zhuban jiti qiye*) was created to fill the gap.

The increased share of non-unit based collective NTEs indicated that there were more non-public resources entering into the high-tech sector. Accumulated individual capital searching for better investment returns was the major source of non-public capital entering the high-tech sector. Although this monetary capital was individual (private), the nature of soft resources in non-unit based collective NTEs was difficult

to define. The backbone of the technological staff of 'non-unit' NTEs either came from state owned R&D institutions or other public spin-off NTEs. They combined the non-unit based NTEs with the technology and know-how that were collectively developed with public resources. Given the lack of market and legal institutions to define and facilitate the transfer of technology and know-how, the nature of intellectual property rights over the technology and know-how brought in by the technological staff was difficult to define and often created a range of problems.

The performance of non-unit based spin-off NTEs varied significantly. In 1991, among the top 50 largest sized NTEs in Beijing Zone, five were non-unit based NTEs; non-unit based NTEs contributed 14 Self Developed Products (SDPs) among the total of 120. On the other hand, 49 out of 221 that claimed losses in 1991, roughly about a quarter, were collectively owned non-unit based NTEs.

Table 6.9 The number of enterprises among the top 50 by nature of ownership:

	1989	1990	1991
State owned	18	20	22
Non-unit	4	5	5

Source: Annual Report of Beijing High-tech Test Zone 1992

6.3.3 The 'bottle neck effect' associated with the question of productive factors and resource allocation

Previous discussions have identified that early reforms in the S&T sector, introducing market mechanisms into the plan, encouraged commercial activities of R&D and business innovation between R&D institutions and the manufacturing and trading sectors. In the process, spin-off NTEs encountered problems associated with ideological and institutional constraints, even though the initial overall outcome was promising. As indicated in section 6.3.2, in the transitional period of late 1980s and early 1990s, spin-off NTEs pursued the second stage of development gaining industrial economies of scale. In the process, the fundamental challenge was how these NTEs could get their hands on productive factors and other scarce resources in the resource allocation mechanism to function within the planned economy.

The *more* market-oriented spin-off NTEs inevitably encountered institutional conflicts when they sought production factors from this source. In the transitional period, the institution of resource allocation still followed the 'top to bottom' '*tiao*' and '*kuai*' frameworks with resources being distributed to *units* that were listed within the budget (*yusuannei danwei*) and allocated within the plan (*jihuanei danwei*) accordingly. In the early reform years, The state plan remained the major channel through which the majority of production factors and resources - investment funds, bank loans, scarce production materials, import and export quotas, skilled labour and production licences etc - were allocated despite market-oriented activities accounting for a growing share of the overall economy.

The majority of spin-off NTEs were, by and large, newly established enterprises that were not positioned within the plan to receive the state budget. In the transitional period, industrialisation and the fast expansion of spin-off NTEs demanded immediate supply of productive factors on a large scale. However it was difficult for them to acquire resources through the established planned channels as 'outsiders'. The transaction costs were very high in getting 'leftover resources' from channels outside the plan.

In the transitional period, most spin-off NTEs were short of manufacturing plant and monetary capital and encountered difficulties in getting production licences, import quota and export quotas, which were crucial for their further development into mass industrial production. The previous section had discussed officially approved methods of acquiring scarce resource such as the adoption of the framework of 'one institution, two mechanisms' structure through establishing joint enterprises with large SOE. However, when enterprises could not acquire scarce resources from officially approved channels, some resorted to 'grey' channels. For instance, some enterprises attempted to reach import and export channels in the coastal Special Economic Zones (SEZs), in particular Shengzhen and Zhuhai.

As a result, 'grey markets' were created, trading in all sorts of scarce resources such as import documents issued by the then Ministry of Economy and Trade and import quotas on mechanical and electronic products and spare parts issued by the then State Committee of Planning. Among the sellers, there were not only SOEs, but also

foreign joint ventures registered in SEZs that were entitled to special policies and were able to get hold of scarce resources.

The rampant phenomenon of trading planned resources, or more accurately trading 'authoritised rights', was publicly 'secret'. Such 'grey' trading was neither legal nor illegal and was left unaddressed. It was argued that this 'grey trading' somehow helped facilitate resource allocation, given the lack of market institution to allocate resources to those who needed them most. The linchpin within 'grey markets' were those who has accumulated political and social capital in extant institutional networks and the *status quo* of bureaucratic power associated with the accumulation of economic capital in China's socialist economy (with Chinese characteristics).

6.4 Interpretation

6.4.1 A summary of the identified phenomena

Question 1: Under what circumstances and to whom have technology and know-how been aligned as property rights? In which ways and in what senses were they positive property rights or negative property rights?

High tech spin-offs in China were established as the response to ideological and economic liberation associated with the overall reform of the 1980s. Liberation and autonomy were exercised in productive ways in some high-tech NTEs under certain circumstances and in unproductive ways in others. Previous sections have identified the following facts and characteristics of high-tech NTEs spin-offs from state R&D institutions at the start-up stage.

1). NTEs were registered with different types of ownership ranging from state and collectively owned, to cooperative (individual business) and foreign joint owned ('private' was not a category at that time). Spin-offs registered as collectively owned with close links to 'mother' universities and R&D institutions accounted for the majority of high-tech start-ups.

Larger sized spin-offs were often associated with top universities and R&D institutions and most were publicly owned. The establishment of university 'Science and Technology Development Companies.' (*keji kaifa gongsi*) were prevalent in leading universities at both national and local levels. They were often the key spin-offs of the university, registered as state-owned and more likely, operated on a large scale and reported sound financial conditions. The presence of large SOEs and other state agencies in different formats within the NTEs sector was also significant at the start-up stage.

2). The financial conditions of some NTEs were unclear and the situation varied depending on different property rights arrangements. More collective NTEs without formal supervision units declared losses; in many cases, they made profits but still declared losses. On the other hand, state-owned NTEs and collective NTEs with supervision from mother institutions, under certain circumstances exaggerated their economic return even when they actually made losses. (For instance, some NTEs inflated turnover per capita by excluding part-time staff from the total work force). Some NTEs receiving National Support Funds, regardless of ownership, often declared 'zero profits' while still making profits. The accurate financial condition of the firm was therefore difficult to identify as a consequence of profit inflation or deflation, tax extraction and the bailout of state funds and bank lending.

In the process of transforming technology and know-how into commercial ends, the embedded property rights of the technology and the ownership of the spin-off NTEs were aligned more to 'collective groups' rather than to the state or 'individuals'. The property rights arrangements of collectively owned spin-off NTEs (both 'unit-based' and 'non-unit based') in terms of the right of use, the right of control and the right to returns were achieved through a dynamic bargaining process between the *de facto* controllers and the nominal owner. However, the question of the ultimate owner of collective enterprises and the rights to residue were not specified at the start-up stage. It created a dilemma in defining such kind enterprises, which were neither completely public nor private, yet were difficult to define as collective.

3). Property rights granted to the owner bringing added value are defined as positive property rights in this study, while those that reduce value are considered negative property rights. Given the fact that the transitional system was devoid of functioning laws, courts, or social traditions needed to support the realisation of the granted property rights, it was inevitable that nominal ownership and “the institution of ownership” remained tenuous at the start-up stage.

“The institution of property rights does not realise spontaneously but instead must be made to function” (Bromley, 1994). The entitlement to ownership and property rights *per se* does not guarantee growth-oriented activities and value-added outcomes. In the first stage of transitional China, advanced technology, know-how, quality high-tech products and effective managerial behaviour *per se* were not rewarded with additional resource allocation and did not automatically bring market success.

To the extent that markets are embedded within society, market value placed on technology or products must be *created*. There is a need to ‘manage socio-political equity’ to make the institution of property rights function and to realise its potential market value. In the context of the Chinese transitional socialist market economy with ‘dual-track’ characteristics, high-tech spin-off initiators who were capable of gaining access to resources, including tangible resources such as capital and intangible policy priorities were more likely to realise their rights of use and control over returns to technology and know-how. Firms with the best political connections, in other words the best social capital, rather than those offering the highest potential return on investment, obtained the bulk of scarce capital.

Previous studies of the reform of Chinese SOEs suggest that it is the availability of soft credit (supplied either directly or indirectly) that determines budget constraints for key economic actors at both the firm and governmental levels in the Chinese transitional context (Edwards, 2000). Economic actors, then, express their entrepreneurial instincts accordingly, either through value-adding strategies in the hard-budget environment or through value-subtracting strategies in the soft-budget context.

In the case of the high-tech sector at the start-up stage, because a large number of collectively owned spin-off NTEs were created with the resources ‘outside the plan’, they were subjected to harder budget environment than the state-owned mother R&D institutions. This study suggests that the flexible ownership and the ambiguity of property rights of NTEs served as channels of value-subtracting in the sense that economic actors adopted value-adding strategies in the jointly created collective NTEs, while pursuing value-subtraction strategies in the state-owned ‘mother’ institutions.

6.4.2 Interpretation: institutional arbitrage of *de facto* control

Question 2: Why was ‘the right to use’ (de facto control) more attractive than ‘ultimate ownership (de jure control) in the spin-off NTEs at the start-up stage?

A broad theme in this thesis is that transitional reform is best seen not as a process involving the granting of rights but instead as one introducing the constraints and opportunities for economic actors. Gradual and partial reforms created a series of new institutional conditions and institutional set-ups that influenced the payoff structure for different kinds of economic behaviour, thus creating opportunities for institutional arbitrage in the transitional ‘socialist market’.

At the start-up stage, regardless of the nature of the spin-off NTEs, all entrepreneurs encountered the challenge associated with the institutional ‘churn’ of reform, summarised in this research *as the lack of the institution of property rights* and the institutions of market in the business environment. The lack of the institution of property rights created the problem of insecure property rights and, as a result, ‘*de jure* control’ (law true or right because of a law) was superseded by *de facto* control.

Although the nature of the centrally planned system was overwhelmingly hierarchical and apparently top-down, power to some extent (particularly in the area of information flows) ran from the bottom up. It was state agents and SOEs managers who retained certain *de facto* powers, ‘rights’, which allowed investment decision-making. It was a ‘creative process’ for both SOE managers and entrepreneurs of spin-

off NTEs to identify opportunities to bring the allocation of society's resources into greater co-ordination through which individual interests could be maximised within the extant institutional constraints. Once discovered, these opportunities were grabbed with both hands.

This thesis argues that entrepreneurship existed in the semi-planned and semi-market system. Because the transitional system was devoid of the institutions of property rights such as the functioning laws and social traditions needed to support them, property rights *per se* did not count for anything. In order to realise the potential intellectual property rights as positive properties, the entrepreneurs (often S&T staff from R&D institutions) from non-state spin-off NTEs needed to be capable of integrating raw government authority into their business to minimize transaction costs within the extant system. A marriage with SOEs was a pragmatic choice in the context of the institutional constraints of the time. On the other hand, SOE managers also attempted to discover opportunities for the more efficient use of resources, yet in this case the incentive structure ensured that their activities were often devoted to value-subtraction activities.

In any economy property rights *per se* do not guarantee growth-oriented behaviour. Economic actors always face a range of behavioural choices encompassing everything from pure rent seeking to pure productivity maximization. In China, enterprises were prepared to cede equity (regarded as a 'cost' if ceding part of the right of control) if the exchange brought high rewards. As indicated in the analysis of spin-off NTEs at the start-up stage, property rights were used as a 'balancing force' and 'strategic tool' to cope with resource constraints and to gain greater individual returns.

Chapter 7 High-tech spin-offs of leading universities at the start-up stage (1980-1992) and the case of Huazhong University of Science & Technology (HUST)

The first part of this chapter will identify the nature of key high-tech spin-offs of the top ranked universities at the start-up stage. Since the reform of the S&T system implemented in the middle 1980s, different types of spin-offs with diversified ownership structures were established in R&D institutions and universities. In R&D institutions, the key high-tech spin-offs refer to high-tech companies which have the following common features: (1) they were larger-sized companies compared with other spin-offs of the R&D institution, (2) they were closely attached to the R&D institutions, which became the direct supervising unit of the key spin-offs and (3) they were companies engaged in the science and technology fields in which the ‘mother’ R&D institution had accumulated national competence with state funding under the plan.

In the second and third parts of the chapter, the key cases of spin-offs of Huazhong University of Science and Technology (HUST) will be examined to support the contextual cases in chapter 6 and the first part of chapter 7. In the fourth part of the chapter, the research sums up the analysis of the case studies and identifies the characteristic of *individualism growing out of the collective legacy* in the development of high-tech spin-offs, understood as the key stepping stone of ‘public entrepreneurship’ in this research. (The research thereafter argues that the property rights arrangement and ownership structure also depends on the individual incentives and visions embedded in the development of high-tech spin-offs).

7.1 The key high-tech spin-offs of leading universities

By examining the common characteristics of these university high-tech spin-offs at the start-up stage, the research will explore the relationship between the initial spinning-off path, the initial property rights arrangements of the spin-offs *and* the rights to which they were entitled and the opportunities they grasped in the later restructuring of ownership in the middle and late 1990s when the transitional market reform entered a more complex phase.

7.1.1 The development of Science and Technology Development Companies (*keji kaifa gongsi*) in leading Universities

Universities, research institutions and their governing bodies played a crucial role in the start-up of high-tech spin-offs in terms of providing financial support. At the early stage, because the Torch Programme identified spin-offs as the preferred strategy to commercialise technology resources, as a result, Chinese universities unanimously set up departments of ‘industrialisation’ and ‘industrial-academic-research’ (*chan-xue-yan*) committees to organise and support high-tech spin-off businesses.

As indicated in the cases of spin-off NTEs based in the Beijing High-tech Test Zone, most high-tech spin-offs were registered as collectives with a supervising unit and set up with assistance from public institutions. Universities not only acted as supporting organisers and liaisers but were also directly converted themselves into corporations. At the start of the conversion, various types of spin-offs were encouraged to grow from scratch. R&D institutions and universities granted their support primarily to these spin-offs which were expected to not only survive the market competition but which also had the potential to be listed as future ‘national champions’ in the relevant industrial sectors. A popular method to restructure the selected spin-off(s) with the institution’s collective resources was through the formation of **Science and Technology Development Companies(STDC)** of the universities’ at the early stage.

The discussion in Chapter 6 suggested that the ownership of the spin-offs NTEs was diversified depending on resource constraints and the individual’s entrepreneurial

alertness in the creative process embedded in the transitional dual-track market. In addition to these features, there was also a *mutual* creative process in the conversion from the original more independent individually-oriented spin-offs to the more unit-dependent Science and Technology Development Companies, in the sense that *bargaining* between the university and the initiator of the spin-offs was the key method adopted to resolve the problems of the assignment of rights and responsibilities of the STDC. The cases of the STDCs are illustrated in Box 7.1.

Box 7.1 'Science and Technology Development Companies' at the start-up stage

Fudan Fuhua Ltd. This was a high-tech spin-off founded in November 1984 by several young lecturers at Fudan university. The initiators began their part-time business by providing miscellaneous technology consultancy and technological services and accumulated strength for further development. Through negotiation with Fudan University, the company was restructured as **Fudan University Science and Technology Development Company**, which was directly attached to Fudan University and not initially entitled to the status of legal person. After further bargaining, in May 1986, the company was restructured as Fudan University Science and Technology Development General Company and was granted legal person status, which allowed the company greater autonomy in its operation.

Beijing University Computing Science Spin-offs (Beijing University Founder). Beijing Founder was initially established as a university high-tech spin-off by Beijing University in 1986 for the commercialisation of the high-tech products developed by Beijing University's Computer & Technology Institute.

The leading computing scientists from Beijing University had engaged in the R&D of electronic data transmission computers since the 1960s and had accumulated essential technology and know-how in the field. In 1975, the state launched the 748 project – a Chinese Character Data Processing System. The project had three sub-elements – a form of Chinese character telecommunication, a Chinese character index system and Chinese character precision phototypesetting¹. After a decade of collective R&D efforts, in 1985, computing scientists from Beijing University successfully developed the HUAGUANG phototypesetting system which was listed as one of the top ten S&T Achievements of China in the year of 1985 and was awarded the Gold Prize of the Geneva International Convention in 1986.

¹ In addition to Beijing University, there were 5 R&D institutions and universities had already engaged in the R&D of Chinese character precision phototypesetting. However, the other 5 units embarked on R&D strategy of developing either the second generation of optical mechanic phototypesetting machine or the third generation holographic analogue storage technology. Computing scientists from

Beijing University launched the **Beijing University New Technology Co.** in 1986 to support the leading computing scientist Wang Xuan in channeling the R&D into commercialisation for further development. The company was renamed the Founder Group and made significant achievements throughout 1990s. Currently Founder Holdings Limited is an Asia Pacific-based multinational group engaged in a diversified portfolio of software and hardware businesses throughout its PRC and overseas subsidiaries and associated companies².

Table 7.1 Key spin-offs of leading universities

<u>PLC</u>	<u>Institution</u>	<u>Spin-off Nature</u>	<u>Spin-off time</u>
Zhong KeJian	China Academy of Science	State-owned	1984 / Shenzhen
Nankai Guard	Nankai University	State-owned	1988
Tianjin University Tianjin Finance	Tianjin University	State-owned	1991
Zhejiang University HaiNa	Zhejiang University	State-owned	End of 1980s
Tsinghua Ziguang	Tsinghua University	State-owned	1988
Huagong Science and Tech	Huazhong University of Science and Technology	State-owned	1989
Qinniao Group	Beijing University	State-owned	1994
Tsing Hua TongFang	TsingHua University	State-owned	Launched in 1997 as a conglomerate of 5 spin-offs of the University established since the end of 1980s
Yunnan University Science and Technology	Yunnan University	State-owned	1988
Founder Tech	Beijing University	State-owned	1986
Fudan Fuhua	Fudan University	State-owned	1984
Jiaoda NanYang	Shanghai Transportation University	State-owned	1983
Zheda WangXin	Zhejiang University	State-owned	1986
Tongji Science & Tech	Tongji University	State-owned	1987
Dong ruan Gufeng	Dongbei University	State-owned	1985
Zhongke Yinghua	China Academy of Science Changchun Applied Chemistry Science Ltd	State-owned	Early 1990s
Jiaoda Angli	Shanghai Transportation University	State-owned	1986

Source: compiled by the author

Beijing University took on the R&D strategy of developing the fourth generation of laser digital storage phototypesetting machine in 1976.

² The detailed discussion on Founder's development throughout 1990s will be addressed in Chapter 8.

7.1.2 Property rights arrangements of key spin-offs

University spin-offs were initiated as a result of the commercialisation and industrialisation of research outcomes described previously in this thesis. They had the following common features at the start-up stage in the 1980s and early 1990s: (i) they started with the constraints of lack of skilled labour, technology and capital (ii) their products relied primarily on the technology and know-how of the original founders who were often leading academics and employees of the university who remained in their life-long jobs while undertaking commercial activities outside the scope of their formal work (iii) the founders used offices, laboratories, research students and other university resources for the development of the firm (iv) their R&D breakthroughs were originally conducted under government programmes, and were very often the research outcomes of state-funded projects and (v) the founders normally received no subsequent financial support from the university, although university directors and department heads contributed to the firm through programmes such as the Torch Programme granting loans to launch the venture, market the products through the university's network and exempt the company from heavy tax.

At the initial stage, given the lack of legal recognition of the ownership rights of such kinds of enterprise and given that the success of the company was as yet unknown, neither the university directors nor the founders of the firm tried to specify ownership details in a formal contract. Neither were there any extant legal norms and institutions on which they could rely. Thus the definition of the nature of these high-tech spin-offs remained a 'grey area', different from SOEs but not legally distinguished from the traditional SOEs nor recognisable as 'collective enterprises'.

My empirical study of university spin-offs of Huazhong University of Science and Technology (HUST) indicates the *bargained* nature of their property rights. With regard to the right to cash flow (the right of *de facto* control), from the time the company began making a profit, profit-sharing arrangements were bargained annually and worked out informally through discussion between the university director and the head of the company. Yet with regard to the rights of control and utilization of the company, the founder managers often exercised enormous personal power over the

firm. The university exercised a limited degree of control over the appointment of the general manager, often the result of informal bargaining between the university and the appointee him/herself. Ultimately, the university retreated from the productive function, strategic decisions and employment contracts of the company, leaving the rights of control in the hands of the founder. This research agrees with Francis (1999) that the bargaining of property rights may have helped the spin-offs resolve problems of entrepreneurship, resource allocation, investment, soft budget constraints and other institutional and economic challenges at initial stage while the university authority remained the legitimate owner of the company, often holding the majority share in the company.

7.2 Huazhong University of Science & Technology - a university developed out of the plan: a historical review

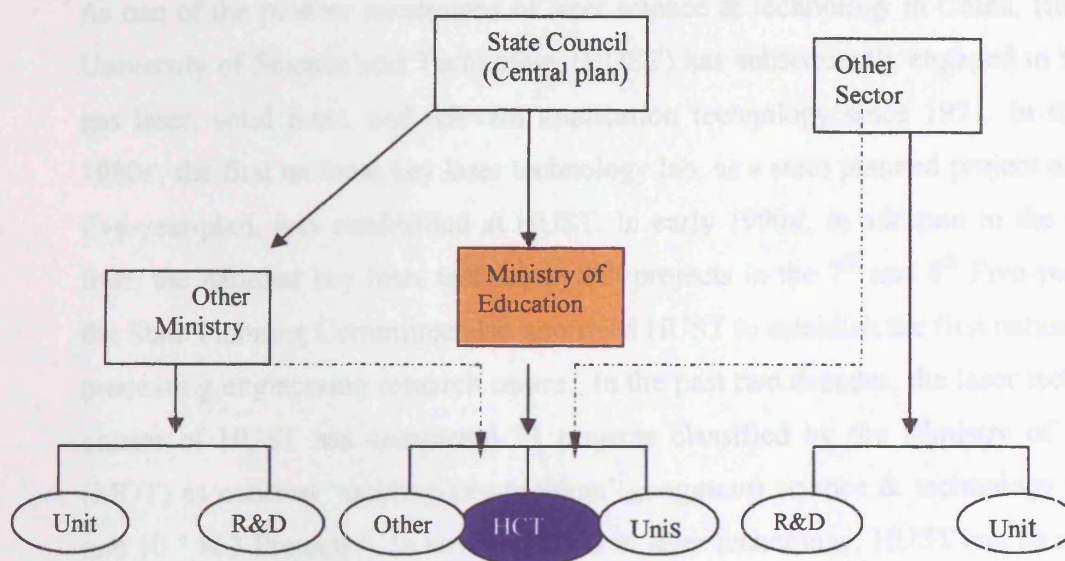
7.2.1 A state nurtured university

Huazhong College of Technology (HCT), the predecessor of Huazhong University of Science & Technology (HUST), was founded in the early 1950s, the capital of Hubei province in central China specialising in engineering technology from scratch in Wuhan. After 50 years development, HUST currently ranks within the 10 top universities in China and is the first advanced learning institute in central China. It is currently among the 35 leading comprehensive universities in China.

HCT was established in the first Five-year-plan under the direct supervision of the central government and was allocated within the '*tiao*' of the then State Education Committee. Although located in Wuhan, HCT was not classified as a local university; neither the municipal government nor the provincial government had administrative power over HCT. The heads of HCT, both the party secretary and the president, were appointed by the Ministry of Education and entitled the same rank as that of deputy provincial governor.

Under the centrally planned system, HCT received resource allocation directly from the central government to finance all its activities. The priority of the university was to nurture skillful technicians and engineers in the fields of mechanic & engineering, electrical energy, power engineering and ship building which were in short supply in China through the 1950s and 1960s. With its remarkable achievements in higher education, HCT was well-known as ‘the cradle of engineers’ in China by the mid 1970s. In addition to education, HCT also undertook R&D projects directly assigned, or, designated by central government authorities. Figure 7.1 indicates the flow of allocation of resources under the planned system.

Figure 7.1: The flow of allocation of resources, R&D tasks under the planned system and the position of HCT within the system



The world witnessed a breakthrough in new science & technology frontiers and an accelerating pace of R&D development in the early 1970s. With the accumulated strength of the university, HCT engaged in R&D in new S&T sectors and expanded beyond the conventional engineering fields. The leadership of the university, headed by Mr. Zhu Jiushi, the forward-thinking president of HCT for two decades, strategically prepared HCT for future challenges³. With the establishment of new

³ Prepared the university in the following aspects: 1) Identifying new S&T fields 2) Inviting domestic leading scientists to HCT setting up new laboratories and departments. 3) Positioning HCT in Beijing to get access to central funding and other vital information and opportunities in terms of resource

laboratories and departments principals involving science and advanced engineering studies, HCT was granted the title of Huazhong University of Science & Technology by the then State Education Committee in 1982.

7.2.2 Historical background: the new mechanism

The strategy of enlarging the capacity and enhancing the R&D strength of HCT in the 1970s was crucial for the further development of the university in the forthcoming reform era and allowed fast entry into new fields such as laser technology, optoelectronics, physical electronics, optical telecommunication, information processing, digital control technology and so on.

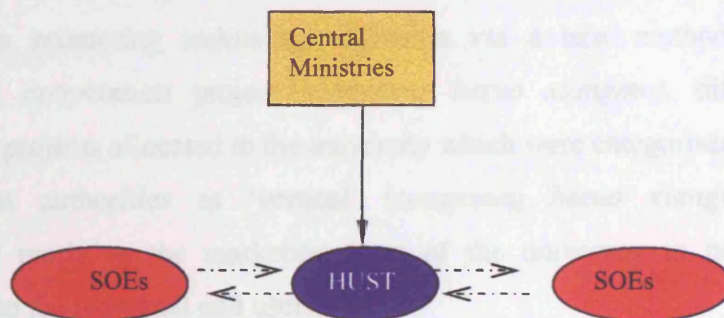
As one of the pioneer institutions of laser science & technology in China, Huazhong University of Science and Technology (HUST) has subsequently engaged in R&D in gas laser, solid laser, and relevant application technology since 1971. In the early 1980s', the first national key laser technology lab, as a state planned project of the 6th five-year-plan, was established at HUST. In early 1990s', in addition to the funding from the national key laser technology lab projects in the 7th and 8th Five-year Plan, the State Planning Committee also approved HUST to establish the first national laser processing engineering research centre. In the past two decades, the laser technology cluster of HUST has completed 21 projects classified by the Ministry of Science (MOT) as national 'tackling-key-problem'(*gongguan*) science & technology projects and 10 " 863 Projects ". In terms of R&D in laser technology, HUST can be regarded as one of the 'national champions'. In addition to laser technology, HUST has also established national competence in the fields of CIMS & CAD, optoelectronics, physical electronics, optical telecommunication and so on.

As the response to the reform policy which shifted the focus of the country from political class struggle to economic construction, the reform of the S&T sector started by addressing the problems raised by the separation of research outcomes and the industrial end users. Universities and R&D institutions were firstly encouraged to co-

allocation, new national projects in particular. HCT was the first few universities, which set up Beijing office and assigned its staff to work for the then State Education Committee at the expense of HCT in the late 1970s. (Source: field interview)

operate with SOEs to transfer the laboratory outcomes into manufacturing activity in industries. The cooperation crossed the division of ‘*tiao*’ & ‘*kuai*’, that governed relevant ‘units’ involved in cooperative operation under the plan at the time. In terms of cross-division cooperation, for instance, as indicated in Figure 7.2, HUST engaged in cooperative projects with different levels of SOEs⁴ based in Wuhan and Hubei province⁵.

Figure 7.2: The flow of allocation of resources, R&D tasks under the reforming system and the position of HCT within the system



Source: complied by the author

There were two types of cooperative projects at this stage. The first type involved the development new products, in which the university would provide the technology and know-how and the SOE would provide manufacturing factors for the pilot production. In this type of cooperation, the university acted as the outsourcing R&D supplier to the SOEs. The second type of cooperation aimed at enhancing the quality and upgrading an extant product and improving the productivity of the manufacturing lines of the SOE with the technological support from the university

In addition to the direct benefits of such cooperation for the involved university and SOEs, there were some side-effects of early cooperative projects which would contribute to the later establishment of university high-tech spin-offs. Firstly, it provided the chance to the lab-oriented university academic staff to have training and experience to adapt to a range of *real* manufacturing processes from product design,

⁴ According their position in the planned resource allocation system, SOEs are administratively classified in two categories - SOEs controlled by central government authorities and SOEs controlled by local government authorities.

⁵ Wuhan, capital of Hubei province, is the fifth largest city in China. Hubei province is the industrial centre in the central China with the spread of full range of the country's leading manufacturing forces in steel, automobile, textile, ship building and machanic manufacturing and so on.

pilot product testing to production and quality control. Secondly, it delivered industrial organisational and managerial training to university academic staff. Thirdly, it allowed university staff to obtain some ‘social capital’, in the sense of building up business networks (*guanxi*), which would be crucial to the successful creation and operation of spin-offs at a later stage. We will discuss these effects in detail in the following sections.

In order to accommodate the change, at the early stage HUST set up a new office of technology diffusion to liaise with industrial end users, mainly SOEs. The office engaged in promoting technology diffusion via a new method, categorized as ‘horizontal cooperation project’ (*hengxiang hezuo xiangmu*), differentiated from traditional projects allocated to the university which were categorised as by the central government authorities as ‘vertical’ (*zongxiang hezuo xiangmu*). The office functioned partly as the marketing team of the university to promote the R&D outcomes to the industrial end users.

Table 7.2: Horizontal projects in the early 1980s

	Nature of the firm	Project
Wuhan Steel Co.	SOE (Central control)	New production line: 1.7 metre rolling mill
Wuhan Heavy Machinery Manufacturing Co.	SOE (Central control)	New technology: solid laser cutting machine
Wuhan Boiler Co.	SOE (City control)	New product: energy saving boiler
Wuhan Gas Turbine Co.	SOE (Province control)	
Second Automobile Co.	SOE (Central control)	New manufacturing technology

Source: compiled by the author with field interview data

The main task of this liaison office was not merely to facilitate the technology diffusion *per se*, but, more importantly to act as intermediary to support R&D staff to go through the adventure of establishing high-tech businesses, the new norm at the time. As the top science and technology university in the region⁶, the liaison office played an influential role in shaping the region’s science development policy. As mentioned previously, the idea of establishing science parks in China was initially

⁶ Here refers to the central China (*hua zhong*), includes Hubei province where HUST is based in, Hunan, Henan, Anhui and Jiangxi province.

proposed by S&T officers from R&D institutions based in Wuhan. The high-tech application liaison officers and scientists from HUST were actively involved in the creation and development of Wuhan East Lake High-tech Development Zone. The zone was the embryonic form of high-tech incubators in China.

According to the 'Decision on the Reform of Science & Technology System' issued in May 1985, the overall objective of the reform of S& T sector was not simply to reduce the amount of government funding allocated to universities and R&D institutions, but to reform the mechanism of resource allocation and to tackle the systematic problems of inefficiency in R&D diffusion.

In terms of resource allocation of 'vertical projects', the reform aimed at inducing market competition into the extant system by replacing the central-direct-control allocation with the indirectly-supervised bidding mechanism. Regarding 'horizontal projects', the market mechanism was introduced as the new norm of operation, in the sense that there was no state plan or designated format to follow to compete the new task. Due to their 'crossing divisions', the horizontal projects were often projects listed outside the plan. As indicated in the analysis in Chapter 6, institutions and their representative agents were entitled more flexible rights of control of the projects outside the plan, which was one of the incentives for R&D institutions to seek 'horizontal projects' more actively.

Like any other large state institution in China, HCT had to provide housing, full medical care, pensions, and a variety of other social services to employees and their families. As a university, it compromised not only teaching and learning facilities, R&D labs but also hospitals, nursery, primary and secondary schools and canteens, a university press and printing factory, shops and factories. Before the reform, the university covered its wide range of social welfare responsibilities with allocated government funding. The reform of the S&T system, according to the 'Decision' issued in 1985, in one aspect, reduced the direct government funding to the university; on the other hand, the reform policy encouraged the university to raise money from the market by granting the university greater autonomy of operation. Similar to the performance reform in the state-owned industrial sector, the university was entitled to the rights of control of the university assets, in the sense that the university could

make the decision to apply R&D outcomes commercially and decide the distribution of self raised income independently.

The new entrepreneurial creed that was proposed by the paramount reform leader Deng Xiaoping, encouraged by the phrase 'to become rich is glorious' became the new norm of reform. The new ideological creed, like the previous ideological movement under Mao, was efficiently implemented via the well-established party/state administrative and propaganda system. The evaluation and promotion criteria of R&D cadres were adapted accordingly to the new ideological creed of becoming rich, in the sense that the capacity to *chuangshou* (raise money) became a more important factor within the administrative hierarchy.

The change of ideological priority brought about the change of incentives and constraints on the behaviour and choice of R&D personnel. In the process of change, the majority of people adopted a skeptical 'seesaw' approach. It was relatively few people with both political and entrepreneurial alertness that made the unconventional step forwards to 'jump into the sea of business'. There were two channels of information which were crucial for administrative officers and R&D personnel to make strategic decisions. The first was the legitimate party/state 'red-headed documents' (*hongtou wenjian*), which were interpreted as the official political 'green light'. The second channel was to observe the informal policies which were allowed for trial in selected pilot reform projects in the S&T sector, conducted mainly by leading R&D institutions based in the Beijing test zone.

The second channel of informal information attracted the most attention as it conveyed the message of possible further releasing of rights and greater autonomy to be granted to the university in the not too distant future. It was believed that the earlier the university got access to trial opportunities, the more 'grey' opportunities for sub-collective groups to pursue group interests were created. There was a saying that 'those who stepped forwards before the policy was officially legitimised would made the most profits (for the sub-collective group)'⁷.

⁷ Source: fieldwork interview with R&D officers and personnel at HUST. I used the phrase 'sub-collective benefits' to describe the interests of the university, department and research cluster as individual group compared with the 'collective benefits' of the broader institution. The sub-collective

In addition to the gradual establishment of the new ideological creed, one of the most common incentives of R&D personnel to engage in the business ventures was simply to escape poverty. The academic and R&D personnel were poorly paid, partly due to the actual *decrease* of direct government investment in higher education and the S&T sectors. By contrast with the first generation of ‘new rich’ who benefited from the early reform, the comparative poverty of those in the traditionally privileged state-run higher education and S&T sectors was vast. The status was vividly described in a well-known satirical saying – *gao daodande buru mai jidande* (egg vendors are making more money than those who design and produce rockets).

7.2.3 ‘Jumping into the sea of business’

As a response to the new norms of ‘getting rich’ and ‘jumping into the sea of business’ (xiahai) in the early 1980s, after the issue of the “Decision” in 1985, HUST strengthened its ‘horizontal cooperation’ with industrial end users. Instead of passively waiting for the allocation of resources, R&D staff were encouraged to actively search for ‘projects’, which had the potential of transferring laboratory R&D outcomes into cash. In 1989, following on from the model of the university high-tech spin-offs in the Beijing test zone, 13 spin-offs were established in 1989.

Once policy changed and constraints lifted, R&D outcomes that used to be regarded as embedding no commercial value turned out to be the most valuable assets over which R&D staff were granted use rights, even though these rights were not clearly defined by law. Regarding the employment of publicly owned R&D outcomes, the institution encountered the question of property rights arrangements. There were two forms of R&D assets, defined as ‘visible’ and ‘invisible’ assets. ‘Visible assets’ referred to the research outcomes of certain projects while the individual staff’s knowledge and know-how embedded in his/her manpower comprised the ‘invisible assets’ which cannot be objectively measured.

group often enjoyed greater autonomy in terms of the rights of *de facto* control of the project, of which the most important power is the essential control of the cash flow. The phrase of ‘sub-collective

Being governed within the planned system and constrained by the rigid ideological superiority of ‘collectivism’, in one aspect there was an institutional vacuum in terms of the lack of relevant laws and regulations to govern unconventional behaviour. On the other hand, people were becoming aware of the importance of such law to defend patents and ‘intellectual property rights’ associated with their new ventures.

In the early 1980s, the concept of ‘property rights’ was more likely jargon to most people, despite intensive debate within a circle of economists and policy makers. The science officers of HUST who were in charge of ‘horizontal projects’ at that time admitted that the concept did not ring a bell in their minds. According to them, the university’s engagement in ‘technology transfer’ (*chenguo zhuanran*) and ‘horizontal projects’ was simply the result of adapting to reform policies of the S&T sector and a response to the calls from central government. It was the central calls and the relevant ‘documents with red stamps’ (*hongtou wenjian*) issued from State Education Committee etc (for party members, there were extra Party documents that addressed the issue) that granted legitimacy to their actions⁸.

The ‘visible asset’, research outcomes, generated with state funding through collective efforts of research groups, were officially classified as ‘public assets’ and everyone involved in the project was, in theory, entitled to any benefits associated with them. The rights of use of visible assets were distributed mainly through bargaining among interest groups relying on ‘common sense’. A research group would split into several sub-clusters in relation to the tasks the sub-clusters had undertaken in the research projects on a whole and according to their expertise. Sub-clusters would then have the use rights of their portion to seek commercial projects and they also able to establish their own funds, most of which later became their ‘*xiao jin ku*’ (savings reserved by small collective groups)⁹.

benefits’ best expressed the spirit of the change at the time when pursuing of individual (private) interest was allowed in practice but constrained to express in public ideological terms.

⁸ Source: field interviews with officers of science & technology department of HUST including retired director of the Office of Science & Technology Diffusion, Mr. Fu Guoliang, ex-director of S&T department Mr. Li Yichang, retired deputy director of the Office of S&T Diffusion Chen Qingsheng, ex-director S&T Mr. Zhang Aiqing.

⁹Source: field interviews. There were pros and cons with regard to the split effect. Some argued that the split has weakened overall R&D strength of the original research group or department. I will address the issue in details in the next chapter.

When the research cluster reached a technology transfer agreement with an industrial user, it also needed to make agreements regarding the use of officially defined¹⁰ ‘public assets’ with the department and the university. It was a process of bargaining at this early stage. The university and the department took a portion of the income and the rest went into research cluster’s ‘*xiao jin ku*’.

The nature of ‘invisible assets’, knowledge of technology and know-how of individual R&D staff, could not be easily defined. This raised problems of ‘intellectual property rights’, sometimes involving legal arguments, in the process of technology diffusion and further growth of spin-offs. The case studies of laser spin-off enterprises, both ‘unit based’ within HUST and ‘non-unit based’ new enterprises, will examine this question in detail.

7.2.4 Policy matters

‘Horizontal projects’ were the major form of technology diffusion at HUST in the mid and late 1980s. Compared with the development of spin-off high-tech enterprises in Beijing, the pace of creating new businesses at HUST in Wuhan was much slower and the scale was insignificant. Local S&T officers addressed this phenomenon as ‘we were woke early, but did not get up quickly.’ It took a lot more than a good idea or the awareness of high-tech commercialisation and industrialisation to succeed in a transitional competitive hybrid market. According to my field interviews, there were other pre-conditions and factors that had impacts on the initial development of high-tech spin-offs.

First, ‘policy’ did matter. In terms of property rights arrangements and ownership structure, the ‘policy’ refers to additional autonomy and extended rights of control granted to spin-off initiators. In the early 1980s, trials in diversifying ownership were first introduced in the four Special Economic Zones (SEZs) – Shengzhen, Zhuhai, Fuzhou and Xiamen – in the south of China, in which new enterprises were founded in the forms of individual business, foreign joint ventures (mainly jointly established

¹⁰ The fact that it was not ‘legally defined’ but ‘officially defined’ represents the lack of formal

with SOEs) and wholly foreign-owned companies (the majority of investors being overseas Chinese from Hong Kong and Taiwan).

Second, the overall level of reform and economic opening and development of the region mattered. As the frontline of China's reform and opening process, political decentralisation and economic liberalisation allowed the region of southern China, Guangdong province and Shengzhen in particular, to benefit from 'policy gaps' and enjoy 'steps ahead' in economic liberalisation compared with other parts of the country. In addition to the region's benefit from its geoeconomic location next to Hong Kong and Taiwan, the unique culture of the region prioritising the norm of business and trade was a vital factor in encouraging economic activity. The second factor aligned with the first factor had impacts on individuals' vision, motives and choices in the initiation of their businesses.

Third, *entrepreneurial alertness* made a difference. The special policies and geoeconomic differences provided arbitrage opportunities for state agents to pursue additional autonomy and essential control of the business. The robust growth of the non-state owned sector in the region of Special Economic Zones (SEZs) attracted R&D institutions from other part of the country to establish high-tech spin-offs.

Given the advantages that were granted to the SEZs and the arbitrage opportunities associated with them, researchers with 'entrepreneurial alertness' from R&D institutions and universities based in Wuhan chose to set up high-tech enterprises in these SEZs. The phenomenon was described as 'peacocks flying south-eastwards', with the implication that the more flexible business environment with priority in regional political and economic policies would attract and accommodate more creative entrepreneurs.

The property rights arrangement and ownership structure of 'south-eastwards flying' high-tech enterprise varied significantly, and as indicated in Chapter 6, the diversified ownership pattern was subjected to the resources constraints that the initiations of the enterprises encountered. In the process of the creation of appropriate property rights

arrangements and ownership structure, the initiators' social networks or social capital, vision and motives associated with their position within the extant system made the difference.

State owned R& D institutions and universities started to set up high-tech enterprises in the SEZs right after the zones were formed in the early 1980s and engaged in intensive 'dual-track' business and trading. In December 1984, China Kejian Co., was founded by the Chinese Academy of Science in Shekou Industrial Park based in Shenzhen SEZ. The strategic step of the top R& D institution of the country was not just an economic model for others to follow, but more importantly, it was a 'political green light' for academic institutions to use collective property for commercial speculation. In the case of Huazhong University of Science & Technology (HUST), the university set up a joint company in Shenzhen SEZ engaging in electronic assembly and other low-key manufacturing in the middle 1980s. The university attached factory was classified as a state-owned investor in the joint company and the joint company was registered as a collective. The university adopted the *contract responsibility* method which was widely adopted by the SOEs to indirectly monitor the operation of an attached factory. While the university's joint enterprise did not survive the stiff competition, it acted as a window to the university bringing in fresh ideas and thoughts from the frontline of economic transition. Besides the university's collective economic venture, the more prominent phenomenon of the day was R& D staffs' individual ventures taking advantage of special political and economic policies that were granted to the southern SEZs.

The most difficult problem associated with the classification of the nature of high-tech spin-offs was how to locate the property rights of the technological know-how that was vital for the initiation of the business. As indicated in previous discussion, the question of the nature of the intellectual property rights – the question of who owns what – was often left untouched at the initiate stage of the spin-off. This research attempts to address the reasons behind the question of fuzzy property rights of spin-offs by observing the case of high-tech spin-offs associated with laser technology development at HUST.

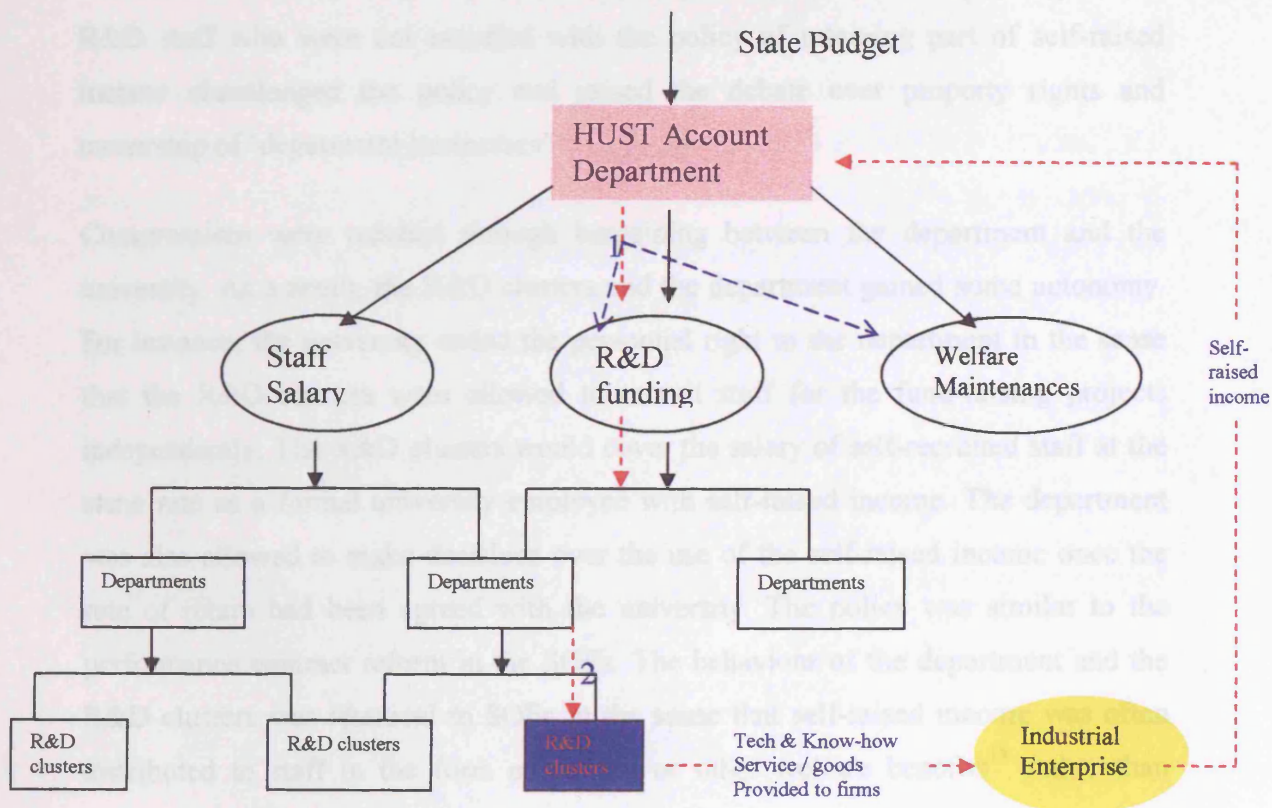
7.2.5 The property rights arrangement of the ‘department business’ (*xiji jingji*) and the early development of spin-offs at HUST

The first group of 13 high-tech spin-offs at HUST in 1989 were companies attached to the academic departments of the university. The staff of the spin-offs still held their academic titles in the department and remained on the payroll of the department, receiving wages appropriate to their academic post and associated welfare. However, the source of their wages changed; their pay was no longer covered by the state allocated budget, instead they were paid with ‘self-raised’ money from the business venture. In addition to the official wage, university staff of spin-offs were allowed to receive a second salary of *xiaoyi gongzi* (wage of efficiency), linked to the performance of the spin-offs and approved by the university through a bargain between the leaders of spin-offs and the heads of the department and university.

The establishment of spin-offs attached to academic departments was a consequence of the development of ‘department businesses’ (*xiji jingji*) in the early stage of S&T reform. The academic department and R&D clusters within the department were encouraged to raise money through ‘horizontal projects’. However, part of the self-raised income by R&D staff was retained by higher administrative levels, meaning that the R&D cluster had to release part of its self-raised income to the department and the university; the retention rate was flexible depending on the result of negotiation and bargaining.

One of the rationales behind the policy of administrative retention of self-raised income was that the technology and know-how used to raise money were defined as state assets, and as a result the university and the department, representing the state and collective owner, were entitled to share the benefits. The other reason behind the policy was a pragmatic issue embedded in the state-planned managerial and financial structure of the university. There was only one unified financial and accounting management system of the university as a ‘fiscal unit’ (*caizheng danwei*) within the plan, in the sense that the cash flow of the university at all levels had to go through one channel - the accounts department (*caiwu chu*) of the university. Figure 7.3 shows the planned budget system of the university and how the retention of self-raised income occurred.

Figure 7.3 The planned budget system of the university and change



Source: compiled by the author. Point 1: university retain occurs, Point 2: department retain occurs

---> The flow of self-raised income by sub-collective R&D clusters

---> The use of retained income

Because of the comparative shortage of funding from the state budget in relation to the growing requirements of funding to effectively manage the housing, full medical care, and other social services (such as nursery, primary and secondary schools) attached to the university, there was a need for the university to retain part of the self-raised income and use it to fund university welfare and support its pure academic activities.

According to one of my interviewees¹¹ who served in HUST for 10 years and later became an officer in the higher education committee of Hubei province, the planned budget system of the university functioned like the 'kitchen of a people's

¹¹ The interviewee does not want to be named in this research.

commune’¹²(*renming gongshe da shitang*), it favoured the staff who relied on the ‘iron rice bowl’ (*tie fanwang*) and enjoyed the ‘big pot of rice’ (*da guofan*) but it constrained the incentives of some staff who were capable of raising money. Some R&D staff who were not satisfied with the policy of retaining part of self-raised income challenged the policy and raised the debate over property rights and ownership of ‘department businesses’.

Compromises were reached through bargaining between the department and the university. As a result, the R&D clusters and the department gained some autonomy. For instance, the university ceded the personnel right to the department in the sense that the R&D clusters were allowed to recruit staff for the fund-raising projects independently. The R&D clusters would cover the salary of self-recruited staff at the same rate as a formal university employee with self-raised income. The department was also allowed to make decisions over the use of the self-raised income once the rate of retain had been agreed with the university. The policy was similar to the performance contract reform in the SOEs. The behaviour of the department and the R&D clusters was identical to SOEs in the sense that self-raised income was often distributed to staff in the form of bonuses or other welfare benefits¹³ rather than accumulated for further development.

After the early commercial exploration, divergent paths for further development were adopted by the university staff owing to the different status of individuals, their priorities, vision and social capital. Some of them made the decision to develop within the boundary of the university in the form of university attached high-tech spin-offs, and the others pursued a strategy of independent spin-offs depending on the resource constraints as indicated in Chapter 6. With the accumulated national strength in laser technology, R&D staff from the laser research centre divided into different R&D clusters and sub-clusters and ‘jumped into the sea of business’ in diversified

¹² The phrase ‘kitchen of a people’s commune’ - refers to a form of communist practice in the ‘Great Leap Forward’, in which all people had meals at the kitchen of the commune. In the context of this research, the phrase is used to describe an organisational mechanism that favours the extreme equality.

¹³ According to one of the interviewee who was a technician of the department of electricity and power engineering, in the end of 1980s, her research cluster had accumulated self-raised income by undertaking horizontal R&D projects. They started to receive bonus and had the autonomy to control the distribution and spending of self-raised income.

forms of business with similar technology and know-how which were classified as collectively-owned intellectual property rights.

In the following section 7.3.2, two different paths adopted by the laser spin-offs of HUST will be examined. The research will firstly observe the ownership structure and property rights arrangements of the laser spin-offs attached directly to HUST with the university as the ultimate owner; secondly, the research will examine the question of property rights of laser spin-offs that were created by R&D personnel of HUST but operated more independently with self-raised resources as a comparative case.

7.3 Laser technology Spin-offs of HUST

7.3.1 The legacy of collective intellectual property rights and the development of the laser industry in the reform era

7.3.1.1 The review of laser technology development in China

As indicated in 7.2.2, HUST is one of pioneer institutions of laser science & technology in China and one of the ‘national champions’ successively funded by the state. The development of laser technology at HUST has been a part of the national collective effort in nurturing China’s laser technology since 1957. A brief review of the development of China’s laser technology will illustrate the collective legacy embedded in the growth of China’s high-tech sector.

In 1957, the first research institution in optical science – the Research Institute of Optical Mechanics of the Chinese Academy of Science (Changchun) - was founded by the leading scientists in the field such as Wang Daheng. The first ruby laser in the world was invented in 1960 and one year later, Chinese scientists successfully developed the first ruby laser in China. The development of laser technology was classified as one of the top priorities in the state’s plan in the 1960s. In order to accelerate the breakthroughs in laser science and technology, the then deputy director of the Chinese Academy of Science, Zhang Jinfu, proposed the establishment of a

professional laser research institute and the State Science Committee and the State Planning Committee endorsed his proposal and selected the country's strongest modern industrial base, Shanghai, as the location for the project. In 1964, the first professional laser science & technology research institute of China and the first of the world as well – Shanghai Optical Mechanic Research Institute of the Chinese Academy of Science - was founded.

Table 7.3 The development of laser technology in the 1960s

Stimulator	The time of successful development	The developer
He-Ne	July 1963	Deng Ximing et.al
Glass (?)	June 1963	Qian Fuxi et.al
GaAs semi-conductor	December 1963	Wang Shouwu et.al
Pulse Ar ⁺	October 1964	Wang Zhongyi et.al
CO ₂	September 1965	Wang Runwen et.al
CH ₃ I Chemical	March 1966	Deng Ximing et.al
YAG	July 1966	Qu Qianhua et.al

Source: "The Report of High-tech Development: 2000", the Chinese Academy of Science

Since its invention, laser technology has been intensively applied in the military & defence industry and in advanced aviation and space projects. China made great achievements in the development of laser science and technology in the 1960s, as indicated in Table 7.3, under the state plan which attempted to pull the nation's resources together in order to strengthen the country's military and defence power. As the top military priority of the country, the basic R&D and the application of laser technology in the military and defence was not discontinued during the Cultural Revolution from 1966-1976. The major breakthroughs such as the development of range ruby laser radar, coherent infrared radar, and the first generation satellite ruby laser ranging¹⁴ were achieved in the 1970s. Compared with the laser application in the military and defence, their application in civil industries such as laser engineering and laser medical equipments was trivial in the 1960s.

In the reform era, laser technology remained one of the top priorities in the country's strategic S& T plan. In May 1980, shortly after the end of China's isolation from the

rest of the world, the first International Laser Conference was held in Beijing and Shanghai; 66 foreign delegates presented 65 papers among the total 218 delegates and 113 papers. Since then, Chinese laser technology has rapidly developed within international community; researchers have more frequently communicated with their international counterparts and young scientists have received education and training in leading countries with state funding. In the 863 programme, laser and optical electronic technology including laser application in the information industry was selected as one of seven national strategic S&T fields. Laser technology was listed as a state planned project in the 6th, 7th and 8th Five-year Plans. The National Science Fund funded an average of 27.6 laser projects per year from 1986 to 1998. A series of breakthroughs such as new generations of satellite laser ranging systems and ICF laser drivers were outcomes of state funded projects in the 1980s and 1990s.

The review of the development of laser technology in China from 1957 to the end of the 8th Five-Year-Plan suggests that state funding and the collective efforts in R&D were crucial for the R&D breakthrough in laser science and technology in China. External benefits of collective investment prevailed in the later stage of commercialisation of R&D collective outcomes in the 1980s and 1990s.

7.3.1.2 The development of the laser industry – technology diffusion “with Chinese characteristics”

Significant development of the Chinese laser industry took off under the policy of encouraging commercialisation and industrialisation after the reform on the S&T system in the middle 1980s. With the rapid growth of this ‘new’ industry, in January 1987, the Chinese Association of Optical Industry (subsequently renamed the Chinese Association of Electronic Optical Industry) was founded and the laser industry was formed as a branch of it. According to the classification of the CAOI, laser technology was widely applied in the form of commercialised & industrialised laser equipment and products in the industrial fields of laser processing & engineering, laser medical treatment, laser printing and image processing, optical storage, laser distance measuring and laser precision in the late 1980s and early 1990s.

¹⁴ With the support of the first generation satellite ruby laser ranging, China successfully conducted

As indicated in Table 7.4, the total sales of the Chinese laser industry in the 8th Five-Year-Plan, 1990-1995, reached 12.5 billion *yuan*. The total sales in 1995 were 69.4 times that of 1990, an annual increase rate of 233%. Laser processing and laser medical equipment have been the sectors that have developed greatest in terms of the scale of sales income generated and the competence of their products¹⁵. In terms of the scale of the sale, the Optical Storage sector mainly in the form of laser audio video products manufacturing achieved 10.9 billion *yuan* and laser medical equipments and laser processing equipment ranked the 3rd and 4th largest sectors with total sales of 252 million *yuan* and 206 million *yuan* respectively.

Table 7.4 The sales of laser industry in application fields in the 8th Five-Year-Plan (1990-1995):
(million *Yuan*)

	1991	1992	1993	1994	1995	Total
Processing	15.18	31.22	39.48	46.42	73.21	205.57
Medical	39.00	41.05	42.86	54.57	74.91	252.39
Laser	16.16	19.07	23.45	21.91	28.57	109.16
Image Recording	5.47	3.37	7.28	0.30	6.15	22.57
Telecom Units	10.71	9.45	28.77	13.82	19.59	82.34
Optical Storage	156.47	844.14	1,322.38	2,582.99	6,006.50	10,912.38
Measuring	118.73	144.49	133.67	149.81	190.55	737.25
Checking control	1.78	6.44	7.78	15.21	6.65	37.89
Entertainment	1.01	1.03	0.13	3.35	3.84	9.36
Material units	14.99	14.70	24.69	23.59	30.77	108.74
Spare units	4.69	6.69	7.68	14.99	20.17	54.22
Total	384.19	1121.65	1638.17	2926.96	6460.91	12531.87
Total (-OS)	227.72	277.51	315.79	343.97	454.41	1619.49

Source "Reports on the development of China's laser industry" Basic Research High-tech Department, the Ministry of Science.¹⁶

distance-measuring of American test satellites Expl-27, 29 and 36 in the 1970s.

¹⁵ Optical Storage has been the sector with the most significant growth that employed applied laser technology in China. The growth mainly came from the VCD/CD-ROM manufacturing sector. This research focuses on laser processing, laser medical equipment and image recording sectors. The main case study concentrates on laser technology spin-offs specialised in these three sectors from HUST.

¹⁶ The association engaged in general administration and management of the industry and started compiling surveys and statistics associated with the growth of the industry in the end of 1980s.

The data compiled by the Chinese Association of Optical Industry – Laser branch, only included information submitted by enterprises registered with the association. Most enterprises specialised in Laser processing, Laser engineering, medical laser equipment registered with the CAOI; some enterprises engaged in laser printing and laser measuring decided to join other industrial associations. With further diversified applications of laser technology, new industry association was established and some enterprises originally registered with the CAOI switched to the new association.

In Table 7.4, the data of the annual sales income of the 'Image Recording' fluctuated from 7.28 million *yuan* in 1993 to 0.30 million in 1994. The formation of new industry association in the sector of 'Image Recording' may be the reason behind it. The data presents the general description of the development of the Chinese laser industry; however, the data regarding the same sector delivered

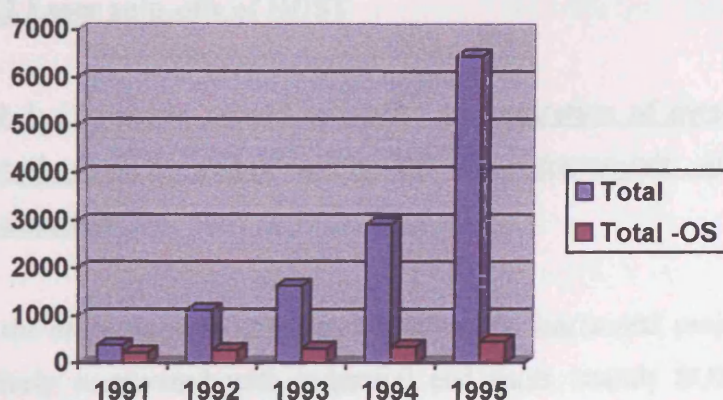


Table 7.5: The statistic of laser medical products in the 8th Five-Year-Plan (1990-1995)

	1991 S	1991 A	1992 S	1992 A	1993 S	1993 A	1994 S	1994 A	1995 S	1995 A	Total S	Total A
CO2	18.33	2,890	17.45	2,678	19.16	2,565	17.77	2,315	22.18	2,698	94.89	13,246
YAG	6.39	184	8.55	228	10.01	254	12.99	201	13.86	208	51.08	1,075
He-Ne	4.77	1,890	5.13	1,334	5.36	1,180	10.66	2,557	21.55	2,401	47.47	9,362
Oph	4.97	52	2.75	45	4.22	51	3.83	51	5.38	72	21.15	271
Others	4.54	450	7.17	229	4.11	103	9.32	248	11.94	281	37.08	1,311
Total	39.00	5,466	41.05	4,514	42.86	4,153	54.57	5,472	74.91	5,660	252.39	25,265

Source "Reports on the development of China's laser industry" Basic Research High-tech Department, the Ministry of Science.

S: Sales (million Yuan); A: Amount (unit); Oph: Ophthalmology treatment equipments

Table 7.6: The statistic of laser processing equipment in the 8th Five-Year-Plan (1990-1995)

	1991 S	1991 A	1992 S	1992 A	1993 S	1993 A	1994 S	1994 A	1995 S	1995 A	Total S	Total A
CO2	10.57	50	21.09	82	22.13	74	25.07	104	43.20	131	122.69	441
YAG	3.52	62	7.72	65	16.99	138	20.38	161	24.92	154	73.53	580
Others	1.09	2	2.42	1	0.36	6	0.34	4	5.14	0	9.35	13
Total	15.38	114	31.23	148	39.48	218	46.42	269	73.26	285	205.57	1034

Source: "Reports on the development of China's laser industry" Basic Research High-tech Department, the Ministry of Science. S: Sales (million Yuan); A: Amount (unit); Oph: Ophthalmology treatment equipments

by different institutions may differ from each other due to the problems associated with cross-registration.

7.3.2 Laser spin-offs of HUST

Path I: University owned spin-offs: the separation of ownership and the rights of control (*jingyin quan*) within the new framework of ‘one university, two mechanisms’.

At the early stage of commercialisation via ‘horizontal projects’, the R&D clusters actively cooperated with industrial end users, mainly SOEs, and developed some industrial products successfully. There were two major kinds of industrial products that the laser research centre of HUST developed with their R&D strength – high power laser processing equipment and medical laser equipment¹⁷. In addition to high power laser technology, R&D clusters from other departments of HUST also engaged in low power laser technology (He, Ne, Ge and Red Diamond laser) development. The development of image recording products were the major commercial applications of low power laser technology.

Following up the pilot development in the industrial high-tech sector, HUST was allowed to adopt the ‘one university, two mechanisms’ structure and, as a result, 13 spin-offs were established on the basis of the R&D clusters that had some commercial experience. Senior lecturer Li Zhengjia set up a company producing medical laser equipment. Three R&D staff from the Optical Electronic Research cluster of the university created Huagong Image Co., and engaged in the production of laser image recording products - holograms. Huagong Image Co., was one of three pioneer hologram manufacturers in China. The university did not invest directly in the start-up of the business, rather acting as *organisational initiator*, it provided the *source* of resources to *individual initiators* to establish the spin-offs.

In the case of Huagong Image Co., the company’s first serie of product was embossing holograms pictures. The development of the new product relied primarily on the technology and know-how of the individual initiators and required low capital investment. However, it was difficult for the individual initiators to obtain capital

¹⁷ The typical product was laser welding/cutting machine jointly developed with Wuhan Heavey Machinery Manufacturing Co.

investment themselves and as a result, they decided to seek support from the university.

The contribution of the university, as the organisational initiator, in this case, was mainly the university's prestige in terms of access to initial hard resources. The then university officers¹⁸ liaised with the university's governing body – the State Education Committee, and other state agencies including the Ministry of Science, local S&T authorities including the local high-tech development zone, in order to seek permits and funding. The individual initiators finally acquired the status of a 'new high-tech enterprise' in Wuhan East Lake High-tech Development Zone and received a 500,000 *yuan* loan from *The Torch Programme* (funding provided and allocated by the MOT) to help them launch the venture, although they gained no subsequent financial support from the university. They applied for the the Torch Programme loan for new technology-based enterprises through the channel of the East Lake HTDZ Management Committee¹⁹.

There was the lack of clear legal recognition of the ownership and property rights of such kinds of company originating from state-owned universities. The nature of Huagong Image Co., officially registered as 'publicly owned' (*quanmin qiye*), was different from traditional SOEs in the sense that compared with the latter, the university, acting as organisational initiator, was only recognized as having 'sponsored' (*ZhuGuan Danwei*) Huagong Image. The university held the nominal ownership of the company but did not have *de facto* control of the company and did not engage in the productive function, strategic decisions or employment contracts of the company. The rights of control were held in the hands of the founder as a result of bargaining process. The university exercised a limited degree of control over the appointment of the General Manager and key personnel, resolved via an informal process of bargaining between the university and the appointee himself.

¹⁸ For instance, Vice President Zhu Yaoting, who used to be R&D staff in the optical electronic research cluster, provided crucial support to the company.

¹⁹ According to the current party secretary of Wuhan East-lake High-tech Development Zone Management Committee, Mr. Zhang Dongping, who was in charge of nurturing NTEs in the end 1980s and early 1990s in the committee, without the start-up loan of Y500,000, Huagong Image would not be able to catch the opportunity and grow up significantly in a short period of time. (source: field work interview)

Although the operation and the organisational structure of Huagong Image Co. were substantially similar to collective and individually owned businesses, it was officially classified as a state asset and was not legally distinguishable from the traditional SOEs. The rationale behind the classification of Huagong Image as state-owned, according to both university officers and the company initiators, was the *public* nature of the initial investments of both the Y500,000 and the technology & know-how that the initiators obtained via *collective* channels.

Case point 2: The ambiguity of the original idea and the question of intellectual property rights over the essential technology and know-how that were channelled into the company

Huagong Image was launched by employees of the university who remained in their life-long jobs while undertaking commercial activities outside the scope of their formal work. The initiators of Huagong Image were four staff from the Department of Electronic and Communication Engineering. Two of them were academic staff, associate Professor Zhang Zhaoqun and engineer Ge Hongwei, a graduate from the top optical and optoelectronics R&D institution in China – the Changchun Optical Science Institute. The other two were supporting technician Wang Shuchu who was a ‘handy’ craftsman in general engineering, and business module tutor Ms. Cao Yulin who had expertise in management studies.

Zhang Zhaoqun and Ge Hongwei were R&D partners in a research cluster, which was the sub-group of the R&D group of the department that engaged in an 863 project on ‘laser real-time monitoring system’.²⁰ The cluster of which Zhang and Ge were members undertook the research on one of essential techniques that was required for the completion of the whole project, that is, the technique of holographic imaging and identification. One of the commercial applications of laser holographic technology is the generation of magic holographic pictures with 3-dimensional images. The commercial activities associated with this kind of product started in the 1970s, but the scale of business was very limited. Because the cost of holographic pictures was very high, the laser-carved image was recorded on special optically sensitive film (only two manufacturers, Agfa and Fuji, were able to produce it) and was not reproducible.

In early 1980s, the invention of embossing holograms made the mass production of holographic pictures possible and thereafter allowed commercialisation on a large scale. The major new commercial applications with economies of scale in the 1980s was holographic solutions for security, authentication and design²¹.

The technology and know-how used by Huagong Image to produce holographic anti-counterfeiting labels were originally research outcomes generated in the project of the 'laser real-time monitoring system'. The R&D cluster involved on this project received funds from the 863 programme and therefore the intellectual property rights of research outcome were officially classified as public assets. The know-how that initiators put into the commercial exploitation could be classified either as public assets, if it was regarded as part of the collective research outcomes, or, as private assets. The commercial idea, or, the diffusion form of the technology, in terms of the application of the holographic solutions for security, was not the 'original' know-how of the initiators of Huagong Image but a 'creative borrowing' from the leaders of the international holographic industry.

The initiators used the offices, laboratories, research students and other university resources for the development of the firm. Under such conditions, it is difficult to pinpoint precisely who owned the original idea for launching the company—a key factor in determining property rights. University directors and department heads contributed to the firm through lobbying with *The Torch Programme* to grant loans, marketing the products through the university's network and exempting the company from heavy tax. In addition to the above reasons, the lack of labour, technology and capital markets increased the cost of identifying the value of various inputs, thus contributing to the 'vaguely defined' property rights.

It was difficult to clearly classify the property rights of Huagong Image at the start-up stage. Neither the university authorities and nor the initiator of Huagong Image made efforts to specify things in detail in a formal contract. In fact, there were no extant

²⁰ A system developed for military use.

²¹ American Bank Note Holographics (ABNH) is a world leader in the origination, production and marketing of mass-produced holograms.

legal norms and institutions they could rely on to delineate the respective rights and responsibilities between the university (the state agency) and the company.

As a result, the university and the initiators contested property rights over Huagong Image through a process of bargaining. With regard to the rights over the distribution of income, from the time the company began making a profit, the arrangement was that Huagong Image would turn over a certain portion of its profits to the university and retain the rest over which they had autonomy of use. The company had the autonomy to make investment decisions with these retained profits, crucial for the company to adapt to the fast changing competitive market. The company had the right to decide the rate of staff for pay within the scale agreed with the university via a bargaining process. The company would use the retained profits to cover the staff's basic pay as university staff, but in addition, staff would also receive a second 'efficiency wage'. Although the university allowed the company to pay at a higher scale, in order to keep a balance within the university and quieten down objections and complaints, the university and the company agreed that the average pay would not be more than 3 times the top scale of the university. As a compromise, the university let the company provide a full-range of welfare to staff. The welfare ranged from basic living expenses in various forms of vouchers and tokens to paid holiday and luxury goods and services. According to interviewees, the monthly vouchers and tokens were enough to cover a family's living expenses and they seldom spent cash to buy necessities such as rice, fruits, toothpaste or toilet paper. The company also bought staff telephones, pagers and allocated each staff a PC at home at a time when these goods were luxuries for normal Chinese families.

The profit-sharing arrangements were bargained every year and worked out informally through discussion between the university director and the head of the company. With regard to the rights of control and utilization of the company, the founder-manager, Professor Zhang Zhaoqun, from the very beginning, exercised enormous personal power over the firm and viewed the company as 'his' firm. As the core of the company, he held authority over the company and effectively united the company staff under his leadership.

7.3.3 A different path – the experience of other laser high-tech companies

As indicated in the case of Huagong Image Co., the nature of the spin-off was to some extent defined by the nature of the source of the start-up finance. The initiators of Huagong Image were able to build up rapport with the university for their business and get access to the state loan. Therefore they adopted a path in which the initiators ceded the nominal ownership to the university for the exchange of *de facto* control and essential resources that were needed for the start-up of business and for the pragmatical benefits of remaining within the university system.

As one of the interviewees smartly suggested: “in doing so, university spin-offs actually seized ‘two rice-bowls’ at the same time. One was the ‘iron rice-bowl’ (*tie fanwang*) while they were entitled to as university staff, from which they received a guaranteed wage from the state. The other was the ‘golden rice-bowl’ (*jin fanwang*) which they created for ourselves through the business venture”. Although they had to share the ‘golden bowl’ with the university, the share they retained was more than enough to satisfy those who played safe – the strategy of guaranteed rewards both political and economical - at the early stage of their business adventure. The average monthly salary for a professor at HUST in the early 1990s was roughly 800 *yuan*, a middle rank staff member with Huagong Image earned up to 4,000 *yuan* plus the extensive welfare benefits covering almost everything from basic living expenses to luxury goods and services, according to one of the interviewees.

Early reform did not simply break down the ‘iron rice bowl’, but, in addition to the guaranteed allocated equal amount of ‘rice’, the reform allowed people to get hold of extra ‘rice’ for themselves. However, those who lacked official rapport and were unable to get access to state funding, or, were simply unhappy with the idea of sharing the ‘golden rice-bowl’ with the university, embarked on a different path of business development.

7.3.3.1 The experience of Chutian Laser

The experience of *Chutian Laser*, a company engaged in laser manufacturing with technological links to Huazhong University of Science and Technology, demonstrated

unconventional methods of business development embedding more uncertainty and risk at the start-up stage. Compared with laser spin-offs of HUST, *Chutian Laser* by nature was more individually orientated. This research analyses the development path of *Chutian Laser* as a benchmark for Huagong Laser – the laser spin-off of HUST²².

Chutian Laser was initiated in 1985 as a result of a suggestion from a visiting scholar to America, who actively advised the leaders of the then Wuhan Bureau of Mechanic Engineering to promote the development of high-tech business by borrowing the model of ‘Silicon valley’. Sun Wen, a graduate from the laser science department of HUST, who was then an R&D staff member with Wuhan Optical Research Institute (a state-owned R&D institution), organised the establishment of *Chutian Laser* with other 6 people from Wuhan Optical Instrument Factory (SOE) and Wuhan Instrument Corporation (SOE). The Wuhan Bureau of Mechanic Engineering invested 90,000 *Yuan* in the company for start-up and key technology and know-how came mainly from the technological diffusion of laser centres at HUST²³. The company engaged in producing laser cutting machines and registered as a non-unit based collective company.

In the first 5 years (1985-1990), the company produced 3 to 5 machines annually, selling for over 100,000 *yuan* each, and the annual turnover was no more than half a million *yuan*. In 1992, *Chutian Laser* moved into the Wuhan East-lake High-tech Development Zone and obtained half a million *yuan* loan through the channels of the high-tech development programmes. The company adopted an opportunistic strategy of diversification and invested in property development and trading of electronic spares. The diversified business was successful and as a result the company not only paid back the loan but also accumulated financial strength for further opportunities.

In 1993, the company was selected with other three companies based in East-lake High-tech Development Zone by the management committee as pilot companies to undertake shareholding reconstruction. As part of the ‘shareholding restructuring movement’ sweeping over China, *Chutian* adopted a similar method of shareholding

²² Source of the research materials on *Chutian Laser*: field work in June, July 2002 including observation of the company and semi-structured interviews with the creator and current president of the company, Mr. Sun Wen; the current general manager of the company, Mr. Wu Zhengda; and other staff.

restructuring as many others at the time. *Chutian* issued both individual shares to the public and legal person shares to business organisations and other institutions and as a result, raised 2.2 million *yuan*. The individual shares held by initiators including Sun Wen under the name of 'technology & know-how' exceeded 50% of the total shares; three major institutional shareholders were the state-owned Hubei Province Mechanic Equipments Export & Import Co., the government backyard company Wuhan Science & Technology Investment Co., and the semi-government institution East Lake High-tech Development Zone Management Committee.

After the shareholding restructuring, *Chutian Laser* also adopted the corporate governance structure of a shareholding company by setting up a board of directors, a board of supervisors and appointed Sun Wen the chief executive of the company. After restructuring, the nature of *Chutian Laser* was thus a shareholding company controlled by the largest individual shareholder, even though the state invested significantly into the company.

Compared with *Chutian Laser*, initiators of high-tech spin-offs of HUST could not obtain the essential control of the company as the largest individual shareholder through shareholding restructuring, although they were initiated in similar methods to that of *Chutian Laser* in the sense that the state loan or funding they received was crucial financial support for their start-up. In the case of Huagong Image, the benefit they generated through the 'shareholding restructuring movement' came merely from issuing unofficial internal employee shares and by doing so distributing super-normal interests to employees under the name of internal employee shares. The abuse of such methods eventually led to a government ban on such behaviour. Thus the individual benefits of the shareholding restructuring mania to individuals at Huagong Image Co. were comparatively constrained simply because of its comparatively clearly defined collective nature and the comparatively effective governance and control of the university over its high-tech spin-offs.

The shareholding restructuring in 1993 was the watershed for the further development of *Chutian Laser* and laser spin-offs of HUST. After restructuring, creators of *Chutian Laser* were strategically positioned to hold the rights of control over the company as

²³ Technological diffusion at that time was not formally instituted and governed by law or regulations.

the largest shareholders. This advantage allowed them to hold the initiative in later stages of development in term of their strategic decision to cede shares for further development opportunities. The thesis will address the issue in part 4 of chapter 8.

7.3.3.2 Ambiguity of intellectual property rights – a double-edged issue

In the case of *Chutian Laser*, the question of the intellectual property rights regarding laser technology and know-how remained controversial depending on the stand points of different interest groups involved in the case. From the perspective of the creators of *Chutian Laser*, the key technology and know-how was embedded in their manpower in the form of individual knowledge accumulated over years and therefore they had no doubts that they were entitled to individual shares as a result of the conversion of their knowledge into commercial products. However, from the perspective of R&D staff at the Laser Centre at HUST, the key technology and know-how that *Chutian Laser* and other small & medium sized laser manufacturers in the region applied for commercial production was originally developed by the laser centre at HUST with public funding. According to one interviewee, *Chutian Laser* and other manufacturers were *tuzi tusun* (sons and grandsons) of the laser centre at HUST in the sense that the technology and know-how they used to start the business were, by and large, ‘copied’ versions of the original collective research outcomes of the laser centre at HUST.

The question remains so sensitive that almost all interviewees from HUST replied to my question regarding this issue by saying : “*shuo buqing*” (I am confused and it is not a straightforward issue). According to one of the interviewees, generally speaking there was the law of intellectual property rights governing the transfer of intellectual properties; however in reality, it is so complex and difficult, if not impossible, to enforce the relevant law and regulations. One of the major concerns of the laser centre at HUST regarding the issue of intellectual property rights was the unconventional (but neither legal nor illegal) technology diffusion through individual behaviour of R&D staff. The R&D staff obtained more autonomy over the application of research outcomes after the research centre had been divided into independent research clusters. There were no clearly defined regulations governing individual agreements between R&D staff and laser manufacturers on technology diffusion; neither were

there any specified rules and regulations governing the transfer of R&D staff from the laser centre at HUST to laser manufacturers. As a result, on the one hand, the pace of commercialisation and industrialisation of laser technology was intensified, on the other hand, the technology diffusion was not institutionalised and out of government control. Given the rampant process of technology diffusion in a comparative short period and the lack of formal law and regulations and informal norms to constrain individual behaviour, the collective property rights of research outcomes were not effectively enforced.

In the hologram industry, Huagong Image also encountered challenges associated with market saturation in a short period of time due to rampant technology diffusion. At the beginning of 1992, there were only 10 hologram manufacturers in China, by the end of 1994, over 200 hologram manufacturers registered with the Chinese Association of Holographic Anti-counterfeiting Industry. According to one interviewee, the major reason behind the mushrooming of the hologram industry was that one key R&D staff member, a university senior lecturer who grasped the key technology of plate making, sold the know-how to small sized manufacturers including individual businesses, TVEs, and government backyard companies who invested in this growing new 'high-tech' and hoped to make quick bucks. The uninstitutionalised technology diffusion led to low barriers to entry into the industry and resulted in vicious competition that jeopardized its sustainable development.

Ten years on, as the interviewees reviewed the early technology diffusion, they argued that such mania and chaos seemed inevitable in the heat of 'jumping into the sea of business' and in their attempt at glory by getting rich. Some observers argue that that group of people who had entrepreneurial spirit created prosperity out of the 'churn' in the sense that there had been a lack of legal and market institutions in the process of change. In such a 'churn', the ambiguity of intellectual property rights had double-edged impacts on the development of new high-tech sectors. As the research identified in chapter 6, the ambiguity of ownership and property rights allowed the initiators of high-tech business to get access to start-up resources by adopting the method of strategically ceding nominal ownership and property rights in exchange for the essential control of the business. I argue additionally that the ambiguity of intellectual property rights, to some extent, facilitated and accelerated the pace of

commercialisation and industrialisation of new high-tech industrial sectors in the sense that it lowered the barriers to market entry of new business.

Compared with the experience of a few successful high-tech entrepreneurs, it was a bitter change for a comparatively large number of normal R&D staff who wished to engage in scientific research but lacked 'entrepreneurship', or, according to one of the interviewee, the 'opportunistic' spirit. They were perceived as inflexible 'old fashioned' people who often did not have a 'liberated mindset' and thus did not make use of the ambiguity of intellectual property rights. As the new political norm encouraged 'opportunistic' business ventures and government policies favoured those with liberated mindsets, it turned out to be a 'learning process' for traditional R&D staff to follow up the 'successful model' of pursuing easy quick money and glory instead of engaging in tough long-term research. As a result, the overall R&D capability of the research institution was not strengthened but weakened after the policy of 'improving R&D standard through industrialisation' implemented in the early 1990s. According to an interviewee from the laser centre at HUST, most substantial R&D breakthroughs were achieved before 1992 when the centre continuously received sufficient state funding and engaged less in commercial activities. After 1992, the commercialisation activities primarily relied on previous research outcomes, applying comparatively lower level technology for commercial development, and as a consequence the industrial activities did not strengthen the R&D as policy makers originally expected. One interviewee concluded on the laser centre's R&D outcomes throughout 1990s as follows "what have they achieved in the 1990s, nothing".

This research merely observes the double-edged outcomes of early commercialisation, but does not attempt to make any judgement of this controversial issue, given the fact that it is impossible to accurately calculate costs and benefits and it would be unwise to make any moral judgement embedded in a 'churn'. This research simply emphasises the pragmatic implication of the 'ambiguity' of property rights, acting as a stepping stone, to facilitate the development of high-tech business in the process of such a 'churn'.

7.4 Individualism growing out of collective legacy

$$g(\text{form}) = f(\text{individual incentives \& vision}) \quad (7.1)$$

In the process of the ‘creation’ of appropriate property rights arrangement and ownership structures for the high-tech spin-offs, the initiators’ social network or social capital, vision and motives associated with their position within the extant system made the difference. As indicated above, the creative process has been a ‘churn’ in which the nature of property rights and ownership remained blurred. Formula 7.1 states that the property rights arrangements and ownership structures also depended on individual incentives and visions embedded in the development of high-tech spin-offs.

7.4.1 Criticism of the conventional wisdom

7.4.1.1 The conventional private property myth

However, according to the neo-classical economies, private ownership is the crucial source of incentives to innovate and become efficient, accounting for what Samuelson (1948) called the “tremendous vitality” of the free enterprise system. Therefore, private ownership should generally be preferred to public ownership when the incentives to innovate and to contain costs must be strong²⁴. (Schleifer, 1998).

Hart, Schleifer, and Vishny (1997) consider two types of investment incentives: those to reduce costs and those to improve quality or encourage innovation. According to their arguments, which ownership structure is more efficient depends on the existence of having high-powered incentives to invest and innovate. The Grossman-Hart-Moore model further argues that soft incentives for public agents to make either form of investment are derived from the very fact of public ownership rather than other

²⁴ The reasons supporting the argument that the gains from privatisation in many instances have been so enormous include the quality of contracting and regulation have improved, competition has become more effective, the dangers of politicisation have become self-evident, and the appreciation of the innovative potential of entrepreneurial firm is at a new high.

additional assumptions such as civil service rules (Stiglitz 1980, 1994), legal restrictions on the compensation of bureaucrats (Williamson, 1994), the complexity of government objectives and so on.

As indicated in this thesis, the experience of high-tech spin-offs in the context of transitional China does not match perfectly the conventional arguments. This thesis argues that the extension of private property rights faces the problem of litigation, that is, even if one has a right to sue, one may not have the legal muscle to enforce the right. As discussed in chapter 6, property rights that cannot be effectively enforced and realised are negative property rights which do not yield cash flows to the nominal owners. There is thus a need to go beyond the boundary of conventional wisdom.

7.4.1.2 Diversified entrepreneurship theories

This thesis has raised the question of how the changing ideological constraints and economic and market conditions have affected the high-tech business creators' desire and perceived abilities to establish a new business. I argue that the property rights arrangements and ownership structure of the high-tech spin-offs were also depended upon the entrepreneurs' individual incentives and visions moulded through interaction with the changing institutional matrix.

According to Abell's theory, what drives entrepreneurial activities is an individual's passive exposure to opportunities.

"An individual becomes an entrepreneur if he/she believes that his/her own use of available resources can yield a higher risk discounted expected income flow when compared with the possibility of hiring them to others. The rate of entrepreneurial entry largely depends upon the exogenous rate of production of opportunities which picks up individuals at random". (Abell, 2001, p.119-144)

Researchers have explored the important aspect of the timing of opportunities for a person to take. Abell (1978, p.21-6) proposed the idea of "strategic windows" which describes the limited periods in which the "fit" between key requirements of the current business market and the particular abilities of a company competing in that

market are at an optimum. This school argues that either cognitive skills or information asymmetries might effect the perception of opportunities.

Other studies of entrepreneurship have yielded significant understanding of specific factors related to the motives of entrepreneurs. Schumpeter (1939) proposed the concepts of “building dynasties”, “the will to conquer”, “the exercise of ingenuity” and “overweening self-confidence” to ascribe discriminating motives to entrepreneurial activities.

Psychologists have further pursued the idea of special entrepreneurial motives²⁵. Watson *et al.* (1998, p.217-38) has argued that there were distinctive differences between successful business founders and unsuccessful business founders concerning their motivations for starting a business and objectives in business ownership. Researchers in this area have identified various “push” and “pull” factors as motivators for business start-ups. The “push” criteria of redundancy, unemployment, frustration with previous employment and the need to earn a reasonable living are important factors for business start-ups. Under conditions of decreasing economic growth and uncertainty of employment, these “push” forces would be strengthened. The “pull” criteria include characteristics such as independence, being one’s own boss, using creative skills, doing enjoyable work and making a lot of money.

There have been other researches that address factors such as different personal backgrounds (for instance rural or urban), the consideration of welfare benefits, tax reductions, indirect benefits, the perceived value of wealth and so on to explore the motivation of entrepreneurial start-ups. Dyer (1994, p.7-21) builds on theories of entrepreneurial careers that contain sub-theories such as career choice, career socialisation, career orientation and career progression by taking the complicated interactions among types of founders and their personal background.

Taking the above research findings into consideration, it can therefore be argued that the conventional wisdom of entrepreneurial ‘incentives’ being merely associated with property rights *per se* cannot provide a satisfactory explanation and appropriate

understanding of the motives of high-tech business creators embedded in the spinning-off process. Yet although neither theoretical findings nor empirical evidence substantially support the property rights argument, the latter has been extensively adopted in China as ‘absolute truth’.

Current arguments normally conclude that business success is accredited to individual entrepreneurship (with the implication of private property) while failure is blamed on the collective or public nature of the business. Fieldwork for this research suggest that a large number of R&D staff involved in the development of the high-tech spin-offs refuted such a cliché²⁶, especially regarding the early development of the business in the late 1980s and early 1990s. This thesis argues that while the spirit of entrepreneurship is vital in the start-up of the high-tech business, the strength of this spirit would not have been released if it had not fitted in to the institutional context in which it was applied.

7.4.2 Public entrepreneurship for the collective good

7.4.2.1 The lack of absolute property rights and of an individualistic culture in China

Liberals argue that the legacy of property rights is linked to man’s social perception of himself. Man becomes an individual with absolute property rights. In contrast to delegated property rights, the institution of absolute property right is not selfish, nor could it have been invented to impose the will of property-owners upon the rest (Hayek, 1988, p77). It is widely accepted by liberals that the spirit of enterprise is by nature linked to an individualistic culture.

²⁵ These characteristics include the need for achievement (McClelland, 1961), a locus of control (Rotter, 1966, p.801), a propensity towards risk, a personality deviance (Collin *et al.*, 1964; Kets de Vries, 1977, p.34-57), a tolerance of ambiguity (Shere, 1982).

²⁶ The first page story in the most important local official newspaper in Wuhan – ChangJiang Daily – on September 15th 2001 eulogised the individual entrepreneurship spirit of the general manager of Huagong Sci. & Tech in the development of the company. When I mentioned the article to the R&D staff of laser centre and the company, some senior staff replied to me with a touch of sarcasm: “his spirit and capability of entrepreneurship is so great that the accumulation of generations of R&D staff’s ‘blood & sweat’ is not worth mentioning.” This case reveals the tension and unsolved problems existed in a wide range of companies in transition.

However, as Will Hutton (2000) argues, in contrast to individualistic culture, it is not difficult to identify the legacy of holistic culture in the history of civilisation. He identifies the different nature of property rights embedded in different cultures, In individualistic culture, he argues, the property right is *absolute*; in holistic culture the property right is *delegated*.

Hutton also differentiates the legacy of property rights in the US and Europe. He concludes “From the start, the autonomy of private property rights in the US has been seen as the legitimate consequence of man’s interaction with nature; civil society naturally respects property and government is cast as its protector.... According to the European tradition, property rights are a concession granted by the state in the name of the common interest. Property is held in trust for all and only delegated to individuals for as long as they accept reciprocal social obligations. This is the legacy not only of the early Christian church and feudalism, but of the fact that Europe was already settled.” (2000, p58)

In the context of China, given the characteristics of Chinese culture, this thesis argues that the *status quo* of property rights in China is similar to that of the European traditions associated with property rights. The social acceptance of absolute property assumes that man is capable of thinking of himself as an individual independent from the social whole, which, this thesis argues, is an assumption which cannot hold in reality.

7.4.2.2 Public entrepreneurship – a stepping stone

Schumpeter (1993[1991]) was the first to explore the entrepreneurial function and its role in social change. The very core of the ‘Schumpeterian entrepreneur’ rests on the importance of vision and imagination for overcoming uncertainty (Kuhnert, 2001: 14). Kwiatkowski (2002) argues that building elements of entrepreneurial society are vital for post-socialist countries to take opportunities for achieving economic growth.

As stated in part one of this chapter, almost all directors and top managers of university spin-offs were leading academics and employees of the university who

remained in their life-long jobs while undertaking commercial activities outside the scope of their formal work. When they started their businesses, there were no contracts clearly defining property rights and thus there lacked 'selective incentives' for their behaviour. There were costs, not just benefits, and risks at the initial stage of creating a business-oriented organisation from scratch when it was uncertain what the political and economic outcomes and rewards would be. According to one of the basic neo-classical assumptions, 'rational self-interested' individuals are not supposed to act to achieve common or group interests, rather they are attracted by incentives to 'free ride'. In that light, why were those leading academics in China willing to bear the high costs of creating business organisations for the collective good?

This thesis borrow Olson's concept of 'public entrepreneurship' to describe the nature of university spin-offs as discussed above. Relying on the institutional approach involving 'a shift of perspective from the determinism of conventional physics...to the non-teleological, creative, and non-determined nature of evolutionary process' (Buchanan/Vanberg 1991, p.168), I gain an evolutionary perspective of the growth of university spin-offs and step towards an explanation of the phenomenon.

How did the then institutional framework mould individual behaviour toward socially beneficial decisions and thereby cause individuals to act as *public entrepreneurs*? As Krusselberg indicates: "When a decision cannot be based on incontestable facts, entrepreneurs make use of their own theories about the reality surrounding them, of their value systems, subjective interpretations of received information, and the conclusions they thus derive with regard to their future actions. In this sense decisions under uncertainty always contain a 'political element' (1969, p.107, [Kuhnert's translation, 2001])".

The institutional framework directed individuals to socially beneficial decisions. Specifically, the legacy derived from the Mao period of pursuing the collective good prior to individual benefit had a crucial influence on their behaviour. However while people were no longer judged politically progressive or backward simply by whether they owned property or how much property they owned as they had been under Mao, they *remained judged* by their political awareness and consequently by *how* they acquired and used their property, and by *how* they contributed to the cause of building

‘socialism with Chinese characteristics’ through their work. This thesis argues that, in this one crucial aspect, fuzzy property rights helped them cope with economical uncertainty: on the one hand, such fuzzy rights allowed the collective unit, not the individual, to bear the burden of any business failure and on the other, such fuzzy property rights helped individuals to avoid ideological puzzles and constraints which existed during the early stages of reform. The set of institutional arrangements that allowed individuals to take different and even contradictory actions thus helped them to cope with the *ideological* uncertainty of the transition.

According to one of my interviewees, at the early stage of reform, the relationship between the individual entrepreneur and the collective state *unit* was like that of the earth rotating around the sun. A *unit* staff member should serve the collective interest as his/her duty; the function is described by the interviewee as the earth ‘revolves round the sun’, in Chinese ‘*gong zhuan*’. The phrase ‘*gong zhuan*’ entails the connotation of providing services for public benefits. At the same time, the staff also started engaging in activities to increase individual welfare once the ideological constraints were lifted; the function is therefore described as the ‘the earth revolves on its own axis’, which, in Chinese is ‘*zi zhuan*’, entailing the connotation of serving individual benefits.

According to Shackle (1964, p.6), human beings are “liberated by the non-existence of any objective future to invent it in an image chosen by them from a range of possibilities constrained only by the orderliness of nature and the facts of their own present circumstances.” Kuhnert (2001) summarises: “Innovative actions must be based on a mental picture of the future. Ex ante ‘opportunities’ exist only in the mind of the entrepreneur (White 1990 [1976], p.8). Thus, the issue is not ‘opportunities which others have not yet noticed’ (Kirzner 1973, p.81) but rather the invention of opportunities by a certain subjective way of interpreting the information that is present in one’s environment.”

In the initial stages of reform, *public entrepreneurs* in China had to deal with ‘uncertainty’, with the ‘imperfect’ knowledge of the ‘right’ way and of the unintended consequences of actions taken to realise desired outcomes. This thesis suggests that individual rewards for public entrepreneurs in China, particularly in terms of the

range of shares for creators and incomes generated from them, varied significantly. In exchange for the investment of their time, resources, skills and capital, they expected power, honour, fame and a change of social status. Some pursued substantial control of the company and began to transform themselves into individual entrepreneurs. Such transformation was not static as it took place under the twin pressures of growth and increased competition.

In chapter 8, the research observes the transformation of the nature of high-tech spin-offs in the process of shareholding restructuring from middle 1990s onwards, and analyses the phenomenon that individual entrepreneurs developed new forms of shareholding structure associated with mixed ownership and thereby regained 'public' status. And in so doing, those *individual* public entrepreneurs substantially mobilised opportunities of going public and subsequently they operated to further the *collective* good.

7.4.2.3 Fuzzy property rights - another stepping stone

As indicated in previous chapters, the government was actively involved in the development of new high-tech enterprises in China as a result of the collective nature of the accumulated R&D strength left by the plan. The institutional legacy of the plan *reconstructively moulded* individual incentives and visions of government bureaucrats and entrepreneurs embedded in the development of new high-tech enterprises in the transitional period. Moreover, bureaucrats and entrepreneurs creatively invented opportunities by interpreting the information that was present in the changing institutional environment.

One of the most common comments from the interviewees and my observation in the field regarding the relationship between entrepreneur and the government in the development of high-tech business at the early stage can be concluded as *nothing is apolitical* in the establishment and development of the business. In the context of China in transition, successful business development could not be achieved without the involvement of government power and political strength associated with it. Therefore, a successful high-tech business creator must have been a versatile person

with resourceful and decisive traits not only in business terms but also in the sense of political awareness of change. The creator of Beijing University Founder group, Mr. Wang Xuan who is also the leading scientist in computing science in China, summed up the qualities that a successful high-tech entrepreneur must have in three aspects. Firstly, as a necessity, one must have updated and broader knowledge in the field. Secondly, also as a necessity, one must have entrepreneurial spirit. However having these two qualities are not sufficient, one must also have the quality of being able to take a 'comprehensive strategic view' (*Quanju yishi*) over the institutional change.

From the standpoint of the business entrepreneur, this thesis argues that fuzzy property rights to some extent was a resourceful strategic choice of the enterprise in exchange for substantial opportunities in the 'churn' of change. From the standpoint of government, one of many pragmatic implications of fuzzy property rights is that they created a relatively flexible entry and exit for bureaucratic involvement in the business. One interviewee vividly described the relationship between the government in terms of the power of resource allocation they held and the development of high-tech business as analogous to domestic politics within a traditional Chinese marriage.

According to him, the government, like the husband, held absolute power (in terms of resource allocation) in its relationship with SOEs, whose position was similar to that of an ageing wife, and with new high-tech enterprises with mixed ownership whose status is equivalent to that of a fresh beauty. The twofold incentives of government bureaucrats are to achieve political promotion and to obtain economic glory by becoming rich in the process. The latter was the new norm of the day and the ability of leading people to be rich turned out to be a key criterion for the evaluation of bureaucrats and as a result were motivated to get involved in the development of new high-tech business. They had less incentive to get involved in the declining SOEs, mostly in sunset industries, which would hardly bring them any political stock²⁷. As a result, it was a rational choice of the 'husband' - state bureaucratic agents - to separate with the 'ageing wife' of the SOEs and replace her with the 'fresh beauty' of new high-tech enterprises and other emerging business organisations. However, there was

²⁷ It is worth of noticing that the assumption of SOEs are more likely associated with inefficiency has been widely accepted by the mainstream academics as an 'absolute truth' and consequently spread over China through the full coverage of media.

always uncertainty, both political mutation and economic risks, associated with the 'fresh beauty', and since the 'ageing wife' still provided somewhat guaranteed rewards, the husband did not ditch her completely. A fuzzy property rights arrangements *de facto* facilitated the 'half-hearted' 'husband' shifting the resources from the side of 'ageing wife' to the 'fresh beauty' with some promising potential at the early stage of change.

Chapter 8 Change of Property Rights and Ownership of High-tech Spin-offs in the Transition to Publicly Listed Company (PLCs) since 1992 onwards

This chapter examines the change of ownership structure and property rights in the process through which high-tech spin-offs were transformed into high-tech shareholding corporations (HPLCs) from the middle 1990s onwards. It examines the change of ownership structure and corporate governance of 23 university high-tech corporations currently listed on the Chinese stock exchanges. These sample companies were originally established as high-tech spin-offs. The key case of this research – a high-tech spin-off from Huazhong University of Science & Technology - is among the 23 sample companies. The analysis is based on primary and secondary data.

In part one of this chapter, the research firstly reviews the historical background of the development of the stock mechanism in the context of the transitional economy of China; secondly, the research analyses institutional constraints on changes in ownership and control within Chinese publicly listed companies. Research findings concerning the change of ownership of 23 high-tech shareholding corporations (HPLCs) are presented in part two. The appendix to the chapter defines the relevant variables and demonstrates the rationale of the construction of the database for the research.

8.1 Institutional constraints on changes in ownership and control within publicly listed companies.

The changing nature of Chinese enterprises as a result of the adoption of stock market mechanisms occurred less by as a result of the drive for efficiency than as a result of a combination of vested interests within social networks and political institutions in which the enterprises are embedded and the economic uncertainty they experience.

8.1.1 The stock mechanism: beleaguered policy choice

As has been discussed in previous chapters, the dominant view with regard to the transition process in China, widely held by observers both within China and without, is that a market economy requires property rights that are defined with sufficient clarity and enforced with sufficient predictability to encourage individuals and firms to expend effort, plan, invest, and bear risks (Oi & Walder 1999, p.1). Since the late 1980s, Chinese firms have been adopting a number of economic strategies and practices that resemble the rational bureaucratic systems found in firms in advanced market societies. The aim of these strategies and practices has always been the reform of ownership and property rights. Yet maintaining public ownership as the dominant form of property rights arrangement was a central concern in the design of China's reform policies from the 'four cardinal principles' spelled out in 1979 to the blueprint of the 'socialist market economy' presented at the 14th Party Congress in 1992 (ibid, p.2).

Property is considered by many theorists as a 'bundle of rights' (see Demsetz 1967, p.104). Property rights in emerging market economies have long been perceived as 'hybrid', combining features of private and public property (Stark 1990, p.351-92). But corporate reform in China has focused on the reassignment of property rights within a *socialist ideological commitment*. And given that this ideological conformity has so far precluded outright privatisation, just how clear can property rights be defined?

China's reform has been conducted largely by 'trial and error'. Instead of seeking to implement a blueprint for reform, changes in ownership and property rights have continued without strategic research and systematic analysis. Changes in ownership and property rights started in the early 1980s by extending the independence and enlarging the decision-making powers of SOEs. This early strategy, with the 'contract responsibility system' (with remuneration linked to output) at its heart, did not bring about the efficiency of SOEs but instead resulted in a weak, stagnating state-owned sector within an otherwise booming economy. It was believed that the existing institutional arrangements were not capable of ensuring the requisite clarity and predictability and that there was a need to create a system which did so. By the end of 1980s, the dominant view was that the development of a stock mechanism (*gufen zhi* could) could be the answer and an effective prescription to save the SOEs.

Those Chinese economists who opted for the establishment of a stock market did not acknowledge or, for some reason, ignored the fact that the fundamental function of western stock markets was to raise funds. Rather than placing high hopes on the resource allocation function of the stock mechanism, the main objective of establishing the Chinese stock market was to 'support the further rudimentary reform of SOEs by clarifying their ownership and property rights'. The economists and decision makers expected to effect a strengthening of the supervision over key agents, specifically the leaders of the SOEs, thereby forcing the SOEs to establish a self-constraint mechanism through the stock market system. They optimistically predicted that all the defects of the SOEs would be eliminated through 'stock mechanism reconstruction' (*gufen zhi gaizao*).

Yet how would property rights be specified and enforced through the stock market? The economic transition of China since 1978 onwards has been widely identified as reform 'growing out of plan' (Walder 1995, p.969-71). Fligstein argues that the reform process is a 'state-building' project of market construction and transformation (Fligstein 1996, p.656-73), in which the state shapes the dynamics and structure of the markets that emerge under its guidance. But could a functioning stock market system, which emerged through a long process of evolution within western capitalism (Chaudhry 1993, p.245-74) be created overnight and enforced in China 'by design' (Murrell 1992, p.79-95, Stark, 1992, p.7-54)? And in any event, how closely should

economic institutions conform to models provided by western European or North American capitalism? Without seeking to solve these puzzles, China's stock market trials, affectionately referred to as 'cross the river by groping for stones', unfolded in unanticipated directions.

Institutional economists argue that organisations and individuals are as likely to act according to social norms and the mandates of the institutional and cultural environments in which they are embedded as they are to act according to the nebulous push of the market's invisible hand. But they are not passive recipients of top-down policy — rather, they interpret, adapt, modify, and even subvert the formal measures that come from on high. One of the typically Chinese characteristics of economic transition is that it has been partly 'bottom-up', not totally planned by the government, but a partly spontaneous process within a more relaxed political and economic environment. Furthermore, the 'Great Leap Forward' nature of this spontaneous process has been another, somewhat bizarre, typically Chinese aspect of the transition. In the 1980s, there was a chaotic nation-wide trade in steel (*dao gangcai*) after the central government relaxed price controls and implemented the 'dual-track price system' over industrial materials. Then in the 1990s there came a period of 'stock fantasy' (*gufeng*) after Deng's 'see-saw' speech leading to the initial wealth 'blow-outs' in the Shengzhen Stock Exchange (SZSE) and Shanghai Stock Exchange (SHSE).

Shareholding restructuring reform ran rampant across China from 1991 onwards. Local governments directly or indirectly supported and pushed the transformation of local enterprises. Enterprises employing the stock mechanism and issuing 'inner shares'¹ increased remarkably in a short time. From 1992 to the first half of 1993, more than 200 enterprises were reconstructed and held the title of 'stock mechanism enterprises' in Jiangsu province alone (Wang, 1993). In Hubei province, there were only 23 stock companies in early 1992, yet within one year, the number had reached 133 (Zheng, 1994). By the end of 1992, more than Y10 billion funds had been raised by enterprises issuing 'inner shares' in Guangdong province. Indeed, the newly transformed shareholding companies increased so quickly that the authorities could

¹ Inner shares: shares issued to insiders - managers and employee - of the company.

not keep proper account. By the end of October 1993, approximately 3,800 'stock mechanism enterprises' in a variety of forms were registered across China (Qian 1997, p.215-240).

The soaring stock market in the late 1991 and in the summer 1992 generated a group of millionaires and ignited a fever of enthusiasm towards the stock market². The desire to become rich quickly through the magic of the stock market was one of key objectives of local government and enterprise managers conducting fast shareholding restructuring. Under such circumstances, it was rare to worry about whether the newly listed companies successfully reconstructed property rights and improved efficiency after flotation. What local government officers and SOE managers were concerned about was not the 'clarification of property rights and the reform of corporate governance' but the success of the flotation itself. It was only after 1993 that the focus of interest concerning the stock market shifted towards the quality of listed companies.

The top leaders' attitude towards the stock market had fundamentally changed by the time the 15th Party Congress 1997 passed the guiding principles for further reform of the SOEs. The 15th Party Congress was a watershed in terms of changes in ownership and property rights. At that meeting, not only outright state ownership but also 'mixed public ownership' (in which the state held the majority of shares within companies with collective, individual and foreign shareholders) was defined as 'public'. This redefinition implied that the stock mechanism would become the principal mode for corporate development in China and the stock market was designated as the correct channel for implementing further reform of the ailing SOEs through leasing, merging and capital reorganisation. By 1997, the China's stock market had reached a point from which there was no going back. As indicated in Table 8.1, by the end of 1997, there were 745 PLCs listed on the Shengzhen and Shanghai Stock Exchanges, the total share value reaching 175.29 billion *yuan* and accounting for 23.44% of GDP.

² While the economists attempted to expound and prove the rationality of a stock mechanism within a 'socialist commodity economy', 'bold' trials were implemented in enterprises in southern China in 1990. But the Chinese stock market was out of balance in terms of supply and demand at an early stage. Because of the intense ideological debate around the formation of a stock market, the number of companies allowed to float was very limited. As a result, the share price continued to soar no matter whether the company was profitable or not.

Table 8.1 Development of Chinese Stock Market from 1991- 2000

Time	Number of PLCs	A	B	Total Share Value (100 M Yuan)	% of GDP	Transferable Share Value (100 M Yuan)	% of GDP	Market Cap (100 M Yuan)
2000.02.26	955	929	108	32228.89		10106.00		
1999.12.31	947	921	108	26167.63		7925.55		
1998.12.31	851	825	106	19505.65	24.52	5745.60	7.22	841.52
1997.12.31	745	720	101	17529.24	23.44	5204.42	6.96	1293.82
1996.12.31	530	514	85	9842.38	14.50	2867.04	4.22	425.08
1995.12.31	323	311	70	3474.28	5.94	938.22	1.60	150.32
1994.12.31	291	287	58	3690.62	7.89	968.90	2.06	326.78
1993.12.31	183	177	41	3541.52	10.20			375.47
1992.12.31	54	54	18	1048.15	3.93			94.09
1991.12.31	14	14		109.18				

(A: A Share; B: B Share. Please see the attachment for the explanation on the difference between A share and B share on the Chinese stock exchanges)

Source: compiled by the author, data from cnlist and China Statistic Yearbook 1998, 2001

8.1.2 Institutional Analysis

8.1.2.1 Institutional arrangements of the Chinese Stock Market

The stock market in transitional China was innovated as another ‘dual-track’ institution with the aim of introducing market institutions to the extant command system that favoured public ownership. According to the governing body of Chinese capital market, the predominance of the socialist public ownership system was to be preserved in the publicly listed companies by maintaining the controlling position of the state-owned share rights pursuant to national industrial policies. As a result, as indicated in Table 8.1, only 1/3 of publicly listed companies shares are on the ‘tradable track’ of stock exchanges, while 2/3 of state-owned and state-owned legal person shares remained in the hands of the largest shareholder on the other ‘non-tradable track’. The price of tradable and non-tradable shares differed significantly, hence the ‘dual track’ arrangement of the Chinese stock market which allowed the largest shareholder to have the privilege of ‘collecting money’ from the public. It was an unexpected outcome of such an institutional innovation that reconciled the rationality of a *capitalist* stock mechanism with a ‘*socialist* commodity economy’. The dual track system of the Chinese stock exchange sowed the seeds of trouble for the future.

Facing the challenge of governing such an unconventional market institution – the Chinese stock exchange - the governance mechanism remained unchanged. Unable to escape the habits built up within the planned economy, the Chinese government attempted to use the financial system to achieve such objectives as rescuing the ailing SOEs, achieving sectoral and regional balance and mobilising resources for specific purposes. Instead of changing the way of thinking and exploring governance innovations in order to adapt to the increasing demands made on it to manage an ever more complex and sophisticated economy, policy making simplistically constructed ‘the market’ through the extant administrative hierarchy.

The most significant control imposed on the primary market was the annual stock issuance plan and the associated cumbersome approval procedures. The process of quota distribution across regions was highly political in nature, illustrated the fact that different provinces were given the same quota for several years in a row.

In the primary market, the public offerings had (and shall have) to go through a complicated approval procedure in which the CSRC (Chinese Securities Regulatory Commission), the State Planning Committee (SPC), the State Economic System Reform Commission (SRC), and the Peoples Bank of China (PBC) jointly determine the annual stock issuance plan, stipulating the total number of new stocks to be listed on the exchanges and the total value of initial public offers.

Since 1993, each province has been given a quota of new listings and the provincial Planning Commission and System Reform Commission selects the candidates. The selection at the provincial level is in principle based on industrial bureaux’ recommendations and the overall balance between industrial sectors. Since 1997, the emphasis of quota allocation has been to support 1,000 key SOEs, 120 large enterprise groups and 100 enterprises experimenting with the modern enterprise system. The final approval for an enterprise’s Initial Public Offering (IPO) is made by the CSRC, based on the recommendation of the provincial government, its assessment of the enterprise’s financial and management conditions, current government policies, and stock market conditions (Ma, 2000). The design of the annual stock issuance plan and the highly hierarchical approval procedure has consequently created a new scarce

resource in the hybrid Chinese stock market – the quota. The existence of the quota has inevitably led to rent seeking and a new web of arbitrage at a scale that was only seen in the early stages of dual-track reforms.

The provision of markets is an entrepreneurial activity and has a long history in the west. But unlike commodity and stock exchanges in the west which are normally organised by a group of traders (the members of the exchange) and where transactions within the exchanges are highly regulated by convention (quite different from any government regulations), Chinese stock exchanges are shaped by the state and remain subject to extensive administrative control and intervention. A key question thus presents itself. Does the institutional framework of China's stock market, characterised by strong administrative intervention, provide sustainable support to publicly listed companies to 'clarify property rights' and thereby improve their efficiency, or does it hinder or constrain them in so doing?

Box 8.1 Restructuring the semi-official institution to PLCs - the transformation of High-tech Management Committee: the case of East Lake High-tech PLC

Wuhan, one of the largest cities in China, is the capital of Hubei province located in the middle of the country. Throughout the plan era, the state allocated resources heavily to the region building up several large-sized steel, machine building and textile manufacturers. In the reform period, as an inland city, Wuhan benefited neither from early special reform policies that the coastal regions enjoyed in the 1980s nor from any advantage of the further profound financial and fiscal reforms in the 1990s. Unlike SOEs in Shanghai and Guangdong, both large sized and medium sized SOEs, which had the privilege of going public on the Shanghai Stock Exchange and Shengzhen Stock Exchange, enterprises in Wuhan had to compete within the quota allocated to the region. In addition to the latter, large sized SOEs which were located in Wuhan but directly supervised by the central line industry or bureau could compete for the quota allocated to the line industry. Very few Wuhan based large sized SOEs seized the quotas of their line industry. As a result, in order to compete with other regions for both economic and more importantly political considerations, the local bureaucrats craved to create 'local champions' and pushed them for listing on the stock exchanges.

Wuhan East Lake High-tech Development Zone Management Committee was originally established as the first business innovation centre in China in 1987 and was later approved by the central government in 1990 as the semi-official governing body of one of 52 High-tech Development Zones – Wuhan East Lake High-tech Development Zone. The committee acted as the facilitator of start-up high-tech enterprises in East Lake High-tech Development Zone

throughout the first half of 1990s. In 1994, the committee got hold of a quota to go public from the Ministry of Science and Technology, which held administrative power of allocating IPO quota within the high-tech sector. The acquisition of quota turned out to be the strategic turning point for the committee in the sense that the committee obtained the right of ‘note-printing’ and would hence transform itself into a real business venture.

The local government was the driving force for the restructuring of the management committee. The committee itself did not own any substantial assets and solid business entities before the restructuring and the only resource it had was the quota. The investment for restructuring came mainly from state-owned land put in by the governing body of Jiangxia District of Wuhan city and monetary capital from state-owned banks’ local branches. The state money was poured in for property development with the main project of infrastructure construction in the East Lake High-tech Development Zone including the building of standardised manufacturing plants and auxiliary facilities. Combining the quota and government investment, the semi-official governing body was thereafter transformed into a publicly listed company – East Lake High-tech – listed on the Shengzhen Stock Exchange. The management committee was the largest shareholder of non-tradable non-transferable state-owned legal person shares of the publicly listed company.

Source: compiled from the author’s field interview

Box 8.2 Ceding ownership for business growth:

Trading of ownership and control rights between East Lake High-tech and private enterprises

East Lake High-tech (East Lake thereafter) is one of the high-tech PLCs transformed from the high-tech development zone management committees in China. What makes East Lake exceptional is the fact that it was ‘the first to eat the crab’ (*diyi ge chi pangxie de*). The management team of East Lake traded the non-transferable state-owned legal person shares it held as the largest shareholder of a ‘*mingying*’ (private) company, *Hongtao K*.

Instead of using “trading” or more accurately ‘selling’ to describe the nature of the process, the official who was involved in the deal carefully addressed it as ‘*faren gu zhihuan*’, which means *exchange* of legal person shares in Chinese, in the interview. The reason is that according to central government regulation, the state-owned legal person shares remained in the category of non-tradable state assets. The trading of state-owned legal person shares was confined within the scope of state-owned legal persons (please see detail in appendix A.2.3: the legacy of non-tradable shares). The case of East Lake raised intensive controversial debates in China. However, neither the pro nor the con side could rely on legal terms to justify their arguments, because the legal definitions regarding the trading of state-owned legal person shares remain blank.

Xu & Pistor (2002) argue that law is inherently incomplete, using the evidence from the history of financial market regulation in the UK. According to them, “under incomplete law, law enforcement by courts may suffer from deterrence failure. As a potential remedy a regulatory regime is introduced. ...courts enforce law reactively,... while regulators enforce law proactively, i.e. on their own initiative.” One of the embedded processes of China’s transition has been to establish from scratch the ‘law’ and enforcement institutions on the base of the extant system that remains subject to extensive administrative control and intervention and is by nature ‘rule by fiat’. In such circumstance, the agents of the regulatory regimes do not merely act as a potential remedy of law, but behave far more proactively to the extent that law is initiated that favour their interests as well.

Because the quota system favoured the large sized state owned enterprises, smaller sized private businesses were unable to get the quota from official channels and had to seek quota through unconventional method. *Hongtao K*, a private enterprise that was created via an unconventional path which this research identifies in chapter 6³, engaged in producing a kind of ‘medical health-care drink’ (similar to a non-prescription blockbuster drug in the UK) that is claimed to increase the red-cell count in the body. With reliance on intensive marketing, the ‘Hongtao K drink’ flooded the regional market, mainly rural areas in the middle and southern provinces of China in a short period of time. By 1996, *Hongtao K* had established itself as a high-tech bio-product manufacturer in the East Lake Development Zone with annual sales over 1 billion *Yuan*. As the company got bigger and stronger, it was much easier for it to get loans from the local branches of state banks and the relationship between the company and local government become intimate (was approaching the point of ‘tying the knot’).

The owners of *Hongtao K* were truly ‘entrepreneurs’ in the sense that they were always able to create opportunities by subjectively interpreting the information that is present in their

³ The initiators of the company, several resigned university lecturers, jumped into the sea of business in 1984 and raised money through the operation of a publishing house and the trading of ISSN numbers. In the end of 1980s, they decided to enter into high-tech sector. They got hold of the patent of a ‘health drink’ from Professor Zhang Tingbi at Wuhan University by promising the professor 8% share of the future business. The initiators mobilised their social networks to raise the monetary investment of the business. One major channel of raising initial capital was to borrow from the state owned institutions which had ‘spare’ ‘self-raised’ money by promising the ‘No. 1 boss’ (often their networking acquaintances) of the state institutions higher return of money (7% from Hongtao K compared with 3% interest rate with state owned banks). Such channel was a typical ‘grey’ area; however, no matter how grey it was, they raised substantial amount of ‘interest free’ money at the start-up stage. (According to one of the insider, Hongtao K did not pay high interest to a large number of lenders as they promised, although their business was very successful and yielded high profits. Because the lending from the state institution was often the No. 1 boss’s individual decision which was by nature ‘grey-to-dark’ in the sense that it breached the government discipline, the lenders would not seek any legal or regulatory procedures to get their money and interest back. As a result, significant amounts of start-up finance that Hongtao K had acquired were virtually interest free.)

environment. They used an extant PLC - East Lake High-tech - as the 'shell' (*ke ziyuan*) or medium to realise the ultimate purpose of getting floated on the stock market - something which would otherwise be impossible to reach as a private company. In addition to the immediate benefit of 'collecting money' from the stock market, through buying in as the largest shareholder of East Lake High-tech, *Hongtao K* successfully diversified its business and reduced the long term risk of relying on a single product (the health drink) for the growth of their business. The 'government background' (with the implication of administrative strength in the allocation of resource) of East Lake High-tech was another invisible asset that *Hongtao K* bought in. Once intimately related with governing body of high-tech development zone, it become more convenient for the company to get involved with other high-tech business with great potential and control some of them through cross shareholding.

On the other hand, the decision makers of East Lake High-tech Management Committee who made the strategic movement of ceding state-owned legal person shares to a private company were also truly 'public entrepreneurs', given the initiatives they invented to facilitate such an unconventional deal. According to the key decision maker, the rationale behind the decision was quite simple: "I just wanted to sell the 'shell'⁴ at its highest market values, and cashed in my (*political*) advantage for future development of the committee." The management committee cashed in 1 billion *yuan* by ceding the state-owned legal person shares to *Hongtao K*, and then invested the money as start-up finance into other promising new high-tech companies in the development zone including 'RenFu Electronic', 'Sante Cable', and 'Kaidi Power'. Thereafter, the committee exercised its administrative strength and political capital to support these new high-tech companies going public, and, as the shareholder, the management committee could share the money raised through IPO from the stock market. Having completed such a circle of 'capital operation', the semi-official management committee thus successfully transformed itself into a *de facto* venture capital investment institution.

Hongtao K was certainly not the only '*mingyin*' private enterprise which wanted to tie the knot with the governing body holding the scarce resource of quota in the development zone. Other private companies intending to seek fast growth (and quick bucks) via IPO also attempted to break the barriers of entry into the stock market by adopting the strategy of trading and ceding ownership and control rights to those institutions which held '*ke ziyuan*' - the quota. Another private high-tech company Chutian Laser located in East Lake High-tech Development Zone, the case this research analyses in chapter 7, was one of four companies selected by the management committee to go through pilot shareholding restructuring in 1993. However, as a medium sized private enterprise, Chutian Laser could not get the IPO quota to be listed on the stock exchanges. According to general manager Wu, the company once ceded 40% of shares to the governing authority in 1998 for 'strategic consideration', which in

⁴ 'Shell': it is called '*ke ziyuan*' in Chinese and used to illustrate the nature of quota as a scarce resource.

essence, involved an exchange of part of the ownership for a better opportunity in the competition for the quota. Once CSRC reduced the barriers of entry for IPO, Chutian Laser changed the strategy and hence recouped shares from the governing body.

As the quota holder, the management committee obviously had the advantage in the bargaining and negotiation with companies who sought strategic co-operation with it. It was a highly competitive process in the sense that only quality companies which either had existing financial strength or had potential would be able to win 'the war of the quota'. Although rent-seeking behaviour was inevitably involved, the partners the management committee chose were often quality enterprises. Because, firstly, given the local government agents' political and economical considerations, only good quality companies would bring them political merits and economic interests; secondly, it was mainly quality companies which were able to compete for the rent-seeking opportunities. Xu (2003) conducted a panel survey study on the quality of publicly listed companies in Chinese stock exchanges and in Russia. According to this study, the quality of the Chinese companies at the initial IPO stage was very good and Xu argues that it was the regional competition that motivated the local government in selecting good quality enterprises for IPO. The empirical study of the East Lake Development Zone supports Xu's argument. Furthermore this research suggests that the flourishing of business-oriented organisation including the booming of the non-state sector and the reintroduction of market-oriented motives into state institutions throughout the first decade of reform has prepared the China stock market with a large group of entrepreneurs. It hence provided the China stock market with competitive force, which, to some extent, acted as a countervailing force against the destructive rent-seeking behaviour.

Within the East Lake Development Zone, the ownership of high-tech companies has been diversified and there has been a growing tendency of cross shareholding among state shareholders, collective shareholders and individual (including foreign) shareholders since the end of the 1990s. The cross shareholding between Hongtao K and East Lake Management Committee was a typical case, although the process itself remains neither legal nor illegal. For those who criticised the deal, ceding state ownership and control rights to a private company inevitably involved public asset stripping and was condemned as 'capital smuggling'. For those who supported it, the case was regarded as a successful capital operation. While the debate goes on, one thing is certain, shareholding restructuring for the purpose of IPO failed to provide sustainable support to companies to 'clarify ownership property rights' as it was originally designed to be.

8.1.2.2 Institutional dilemma - failed attempts at clarifying property rights through shareholding restructuring in the stock market

The more complex the exchange and the larger its economic scale, the more necessary is it to have complex and credible institutions acting *impartially* as third parties in policing and enforcing agreements (North, 1990). One assumption implied within the design of the institutional framework of Chinese stock markets is that their governing bodies are genuinely *impartial* agents of the state.

Agents, as well as other organisations, are purposive entities. Agency theory analyses the important impact on incentives and behaviour on agents, defined by the opportunities afforded to them by the institutional structure of society. Bureaucratic agents' behaviour is not static and immutable and analysis of economic change therefore requires an understanding both of officials as economic actors and of the varying incentives, constraints, and resources that shape their opportunities and choices (Qian & Weingast 1997, p.83-92).

A school of scholars (Lieberthal, 1985; You Ji, 1998) identifies the following characteristics of Chinese polity in terms of the country in transition: (i) the *party / state* governance structure has remained dominant but (ii) there is a conflict between vertical hierarchy classified by industry and the horizontal local bureaucracy over the control of benefit streams - (*tiaokuai fenge*) and (iii) - ineluctably derived from (ii) - the central government is comparatively weakened in terms of the essential control over the economy in the face of strong local powers, resulting from the process of decentralisation.

As we have seen above, it has been political agents as purposive entities at central and local level, which have shaped the direction of institutional change of the Chinese stock market. At the central level, in 1992, the CSRC was institutionalised within the extant regime of power rather than as an independent governing body of the stock market. The CSRC was granted a parallel administrative rank and similar powers to other formerly established bureaux such as the State Planning Committee (SPC), State Regulation Committee (SRC) and the People's Bank of China (PBC), the arrangement reflecting the balance of power among different interest groups. At local

level, the local authorities held the right of recommendation (of companies for flotation) while the CSRC tightly kept final approval in its pocket. But, as stated before, the propensity of the market to 'blow-out' has gone beyond policy control. As a result, central control over the stock market has shrunk and shifted, through preferential quota allocation, towards key SOEs and national champions under direct vertical control of the central government. Constrained within such an institutional framework, stock market outcomes are determined largely by a bargaining process between political agents rather than resulting from entrepreneurial behaviour. The hybrid 'policy-driven' market discussed above has been the inescapable result of such a linear construction and incorporation of 'the market mechanism' within 'the plan'.

The policy shapers reiterate that the key official objective of establishing the stock exchange has been to 'clarify ownership and property rights'. Even in ideal circumstances, it is an unachievable target: the existence of perfectly specified property rights is one of the assumptions of the textbook neo-classical economic model, however, it can never be realised in the 'real' world, full of uncertainties and positive transaction costs. And, in contemporary China, the circumstances are very far from ideal.

As stated before, the assignment of rights in the process of shareholding restructuring and in the Chinese stock exchange are allocated by traditional norms of behaviour through the extant administrative hierarchy rather than being defined and enforced through the legal structure. Rights are not only assigned but also defended simply by administrative power, a process that, from the beginning, has lacked the formal legal constraints of duty and liability. Therein lies the fundamental dilemma: how does one get government agents to behave as impartial third parties in a complex world with growing opportunities for exercising discretion over the use of property and enhanced opportunities for rent-seeking?

Although the publicly listed companies and the financial organisations represent the respective interests of the bureaucratic systems to which they belong, their intertwined political and economic interests had led inevitably to collusion among the financial institutions, the publicly listed companies and their governing bodies. The bulk of the collusive activity takes place in the grey area of law and regulations. Many previous

restrictions are lifted and previous rules modified in the name of 'promoting reform and opening economic development'.

For instance, most securities companies and TICs with SHSC or SZSE memberships have been authorised to serve as brokers as well as dealers on their own accounts. These financial institutions have been established through conversion, creation, and adoption within the existing bureaucratic networks (Lin & Zhang 1999, p.211-226). Corporate investors, such as the investment funds, are connected to governing bodies in control of large amounts of resources and are well positioned to reap huge gains from the practice of insider dealing and to generate significant profits for themselves and their upper authority – governing bodies of the stock exchanges. At the local level, in order to get approval for the enterprise's initial Public Offering (IPO), the local authorities convert, create and adopt companies to meet the assessment criteria set by the CSRC. It is the norm of the game that local government officials are then involved in recommending companies for public offering on the basis of sometimes-speculative financial reports.

Previous researches have emphasised the importance of regulations over shareholding restructuring and stock exchanges. However, they have failed to realise that laws cannot work by themselves and that law is by nature incomplete. The law that is not carried out is tantamount to no law. For another school of scholars who have identified a vacuum of judiciary institutions in transitional China, 'the pursuit of power and plenty by economic actors in society' is seen as the linchpin of economic transitions (Nee 1996, p.945). Similar views from Chinese economists consider 'the bureaucrats corruption as a more efficient way to allocate resources (He 1998, p.86).'

It is the argument of this thesis, however, that the above views, particularly when applied to the stock market, pose dangers for China, and that, on the contrary, when law fails in deterrence, regulatory power has to be brought in. The real challenge in transitional China lies in the difficulty of defining and balancing the powers of the judiciary and regulators within the current institutional framework and gradually nurturing enforceable judiciary power out of regulatory force. In the long-term, more sophisticated governing tools - formal rules, informal constraints and substantial

enforcement – and social norms of judicial authority are increasingly necessary as the stock market as a market institution grows.

Property can be understood as a benefit (or income) stream (Bromley 1991, p.2) and property rights as ‘claim(s) to a benefit stream that the state will agree to protect through the assignment of duty to others who may covet, or somehow interfere with, the benefit stream’ (ibid.). North concludes: ‘the rights to an asset generating a flow of services are usually easy to assure when the flow can be easily measured. Therefore, when a flow is known and constant, it is easy to assure rights. When the flow of income from an asset can be affected by the exchange parties, assigning property rights becomes more problematic (North 1990, p.57-58).’ The institutional arrangements of the Chinese stock exchanges have granted central authorities the rights of distributing quotas for listing and the final approval of IPOs, and local authorities the rights of recommendation. The opportunity for enterprises (no matter what their nature, whether public or private) to float is scarce while the possibility of collective ‘blow-out’ is irrationally high and irresistibly attractive. Governing bodies are essentially granted control over enterprises’ benefit streams, a right afforded by the institutional arrangements. The authorities do not act as agents but are directly or indirectly involved in the enterprises as shareholders and stakeholders. Therefore, the property rights of enterprises are obscured and entrepreneurs’ control over their assets weakened, rather than clarified and strengthened, as had been originally hoped.

Box 8.3 Strengthened or weakened? Rights of control with Huagong High-tech PLC

Laser spin-offs of HUST sustained a high growth rate throughout 1990s and developed quickly from R&D workshops to medium sized industrial manufacturers. In 1997, Huagong Image nearly trebled its turnover from the previous year with total sales of over 30 million *yuan*. The total sale of Gaoli was over 15 million. As medium sized companies, none of them met the requirement of going public that was laid down by the CSRC. Furthermore, it was almost impossible for a single spin-off to get hold of a quota.

Top ranked universities in Beijing and Shanghai had privilege in the distribution of quota allocated to the higher education sector. HUST did not get a share in the first round of quota allocation in the middle 1990s from its line bureau; neither did the local government quota distribution favour HUST given its status of a university under direct supervision of the Ministry of Education.

Having observed the fast growth of university high-tech PLCs and increasing strength of universities with high-tech PLCs in the sense of the money collected from IPO, the leaders of HUST were determined to follow up their 'successful model'. Hence the university mobilised its resources and networks to campaign for an IPO quota to create a HUST PLC. In order to meet the requirement of CSRC, the university pushed its high-tech spin-offs, attached factories and two local companies to form a conglomerate under the banner of Huagong High-tech with total assets over 300 million *yuan*. The two local companies involved represented the interests of the local government agents who had administrative power in the competition for the quota allocated to the region.

The initiating companies of Huagong High-tech are listed in the following table. Four out of six initiators – Wuhan HUST Industrial Group Ltd, HUST Printing Co., Wuhan Hongxiang Information Technology Co., and HUST Mechanic & Electronic Engineering Co. – are classified as '*xiaoban qiye*' (enterprises set up by the university) with 'exclusive investment from HUST' and thus are by nature state-owned enterprises in the IPO statements. However, it was also mentioned in the IPO statements that "although HUST controls these companies in managerial relations, the four companies are independent from each other in terms of property rights arrangements"⁵.

Wuhan HUST Industrial Group Ltd was transformed from the university's Science and Technology Development General Company (STDGC). Major university spin-offs that developed successfully since 1990 including Huagong Image Ltd., Huagong Laser Engineering Ltd., Kaimu Software Ltd., Huazhong Software Ltd., and Gaoli Electronic Ltd while seven other smaller sized university spin-offs remained under administrative supervision of the university's STDGC, although most of them held independent legal person status.

Gaoli and Huazhong Software were HUST's wholly owned subsidiary companies and the STDGC acted as the legal person of these two companies on behalf of the university. Throughout the 1990s, most university spin-offs have gone through co-operative shareholding restructuring or shareholding restructuring and as a result, the ownership of these companies has been diversified and cross-shareholding among university spin-offs popular. Wuhan Hongxiang Information Technology Co., as a HUST spin-off, held shares in Huagong Image. Wuhan Construction Investment Co., held shares of Huagong Laser Engineering Ltd.

For the purpose of going public, the university merged its spin-offs with very different ownership and property rights structures and created Wuhan HUST Industrial Group Ltd with total registered assets of 2 billion *yuan*. The Group Ltd made 954.6 million *yuan* input into

⁵ Translated from the IPO statement of Huagong High-tech, p.10.

Huagong High-tech and assured its position as the largest initiator and shareholder of the ready -to- float giant.

Box 8.3 Table: Share structure of Huagong High-tech PLC

Shareholder	% of total share	Nature of shares
Wuhan HUST Industrial Group Ltd	56.92%	State-owned legal person
HUST Printing Co.,	6.11%	State-owned legal person
Jiangnan Petrol Drill Ltd	5.96%	legal person
Wuhan Construction Investment Co.	3.46%	State-owned legal person
Wuhan Hongxiang Information Technology Co.	0.76%	State-owned legal person
HUST Mechanic & Electronic Engineering Co.	0.7%	State-owned legal person

Source: data from IPO document of Huagong High-tech PLC

Although the university remained the nominal ultimate owner of the spin-offs and retained both administrative authority and the rights of residual over them, it was the initiators who acted as independent legal person representatives and held *de facto* rights of control in the spin-offs. In practice, the university allowed spin-offs their autonomy in the operation of their businesses and did not interfere in their decision-making. The university only collected profits from spin-offs based upon the rate reached through negotiation at the beginning of every fiscal year. Given the historical context, fuzzy property rights and unclassified ownership of the university spin-offs was a pragmatic arrangement that facilitated the initial development of spin-offs.

With their fast development and changes in reform policies, spin-offs were more and more independent to the university. The initiators of spin-offs were seeking opportunities of changing the status of being university spin-offs. Some spin-offs left the university while some decided to stay. According to one of the initiators: "The university only helped us acquiring 1million *yuan* start-up bank loans, nothing else. Although we are university staff and receiving a pay-slip every month from the university, we did not get paid from the university's state budget, but from our company's budget. I promise that everything in this company, even a nail, is purchased with the money we made. We have already paid back the loan and transformed into a shareholding company, however, the university still held the nominal ownership. We did think about detaching from the university to become a fully independent company. But we did make the step, our major concern was that the R&D advantage and the reputation associated with the university remained crucial to the success of our business. We were not strong enough to go independent at that time. I don't know, it was very difficult to make the decision at that time. Who knows, maybe we should have done it (detach from the university)."

The political and economic motives of the university leaders to push the formation of a conglomerate for flotation was obvious in the sense that the deal would collect a large sum of money that the university needed for further development given the declining direct government investment. A bigger, richer university that is able to sustain the fast expansion of teaching and research would be the best political achievement of university leaders. The political merits are measured by the hard targets such as new buildings, facilities and new recruits of top academics and all these activities cannot be achieved without huge amounts of capital. Given the significant benefits generated from IPO of leading universities' high-tech corporations in the middle 1990s, HUST followed up their strategy of floating the university's high-tech corporations.

However, it was a rather tricky decision for Huagong Image to make on whether to join the conglomerate. The initiators of Huagong Image who had *de facto* control of the income stream of the company were lured by the promising opportunity of IPO and were prepared to sacrifice part of their substantial rights of control for it. As the most profitable company of the university, the managing team (also initiators) of Huagong Image proactively bargained with the university authority and managed to maintain their autonomy over a partial control of the income stream of Huagong Image within the conglomerate group. Huagong Image would retain the rights over production decision, pricing decision, sale decision, purchase decision, use of profit retention, personnel decision, hiring and firing, wages and bonuses, and internal organisation design. However, Huagong Image had to trade off its legal person status and transformed itself from an independent company to merely a branch of Huagong High-tech. As a result, Huagong Image is subject to the supervision of Huagong High-tech. After restructuring, Huagong Image, together with Gaoli Electronic, Kaimu Software and Huazhong Software, became '*feng gongsi*' (branches) of Huagong High-tech⁶.

Huagong High-tech had gone through shareholding restructuring before the IPO. A structure of shareholder perspective corporate governance was introduced with the establishment of the board of directors, the board of supervision and the appointment of independent board directors. The procedure of restructuring was a process full of bargaining, negotiation and compromise among all parties involved. The final arrangement reflected the balance of power and interests within the group. The President of the university naturally became the chairman of the board of Huagong High-tech. Having the advantage of age and as the manager of the university's wholly-owned subsidiary company, the general manager of Gaoli Electronics was appointed the general manager of Huagong High-tech in his early 40s, although Gaoli was not

⁶ As an interesting exception, Mechanic & Electronic Engineering Ltd of HUST remained as an independent company and was involved as one of six initiators of Huagong High-tech. The person represented this company's legal person status was the then president of HUST who later became the minister of education of China in 2002.

the most important contributor to the group in terms of capital investment. The general manager, also the creator of Huagong Image, Mr. Zhang, who remained in his professorship with the university in his late 60s was appointed one of three deputy general managers and one of nine directors of the group. The general managers and managers from other smaller university spin-offs were granted positions on the board of directors and board of supervision depending upon their companies' capital contribution and their administrative ranks within the university. The least powerful and lowest ranked staff were appointed onto the board of supervision to represent the workers union.

Huagong High-tech went public on the Shengzhen Stock Exchange in May 2000 and promoted a high-tech share with great potential. It successfully raised 400 million *yuan* from the IPO. Regarding the distribution and the investment of the money, the university authorities had absolute power. Huagong Image not only realised that it would not receive the share of the money they felt they deserved from the IPO, but also faced the unexpected situation that the chairman of the board took over the rights of investment over their business. Because Huagong Image lost their legal person status, the general manager and top management team had to cope with the threat of being discharged from the business they had created with their 'blood and tears' by a group of better positioned people who merely grasped 'the fruit'.

After shareholding restructuring, the control of income streams within Huagong Image became even fuzzier. The creators' property rights over income stream were weakened as the result of the trading off legal person status for the IPO opportunity, by trading off uncertainty and risk associated independent growth for guaranteed fast high rates of return on capital operations. The clarity of property rights and the rationale of efficiency were not relevant in such an opportunistic procedure. It was to some extent necessary to have property rights and ownership muddy and undefined in the sense those government agents would have more space for manipulating group interests.

Source: compiled by the author from fieldwork record.

8.2 Case study of high-tech Shareholding Corporations

Property rights arrangements in university high-tech spin-off ventures were fuzzy at the start-up stage and continue to remain unclarified. The paradox is that university spin-offs performed impressively through intense competition in innovation-based sectors, their growth dependent upon the sophistication of clusters, company

strategies and strong operating practices, despite the inadequately developed microeconomic business environment⁷ and the unclarified institutional arrangements.

For the purpose of interpreting the above paradox, this research examined the evolutionary process of university spin-offs, conducting a survey of 23 high-tech companies currently listed on the two Chinese stock exchanges initiated as university spin-offs. These high-tech shareholding corporations were ultimately controlled and owned by universities and state research institutions and were listed among the top 100 publicly listed high-tech companies at the end of 2001.⁸ The research observes the change of ownership and control in terms of the major players involved.

8.2.1 The background of university high-tech publicly listed companies

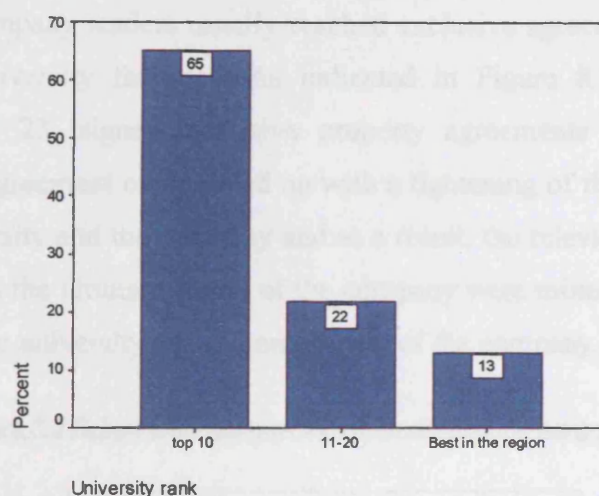
Figure 8.1 identifies the status of key sample universities in our study. Most universities, as the largest shareholders of high-tech publicly listed companies are leading comprehensive universities under the direct supervision of the State Education Committee (SEC), the rest are either directly controlled by line bureaux or ministries of relevant industries (*zhuguan bu*) or patroned by local government. As indicated in figure 8.1, 65% of the sample companies, 14 of 23, are controlled by the top 10 universities of China; 22% of them, 5 of 23, are controlled by Chinese universities ranked among 11-20th; and the rest 4, 13%, are in the hands of universities or research institutions which are the leading regional R&D institutions. These universities and

⁷ To include the extent of bureaucratic red tape, the quality of infrastructural facilities, the condition of governance, the lack of sophistication of market institutions, constraints on the liberation of trade and quality of S&T research institutions and police protection of business.

⁸ All samples are shareholding corporations listed and traded on Shanghai Stock Exchange (SHSE), Shenzhen Stock Exchange (SZSE) and Hong Kong Stock Exchange (HKSE). Data of all companies included in this research are obtained from the China Securities Regulatory Commission (CSRC) official database and companies' databases for public.

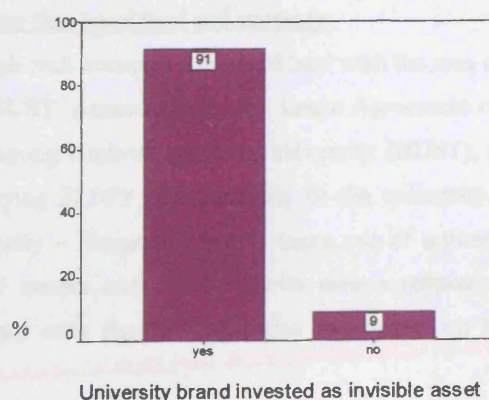
R&D institutions are classified as ‘national champions’ holding the status equivalent to large sized SOEs in ‘pillar’ industries in China.

Figure 8.1 The status of sample universities



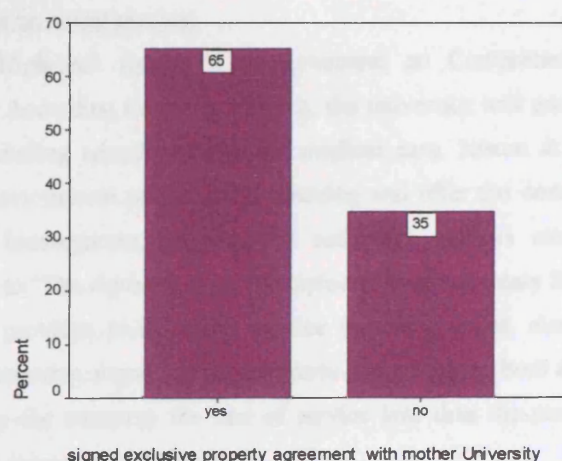
Top universities have accumulated a web of social assets over their historical developments. It was argued that the university brand, e.g. *TsingHua* University, entailed a powerful reputation in the development of science and technology in modern China and thus embedded great commercial value. This argument was widely accepted in the middle 1990s and as a result, university names were defined as invisible assets owned by the universities and were consequently converted to state-owned shares when spin-offs were restructured as high-tech shareholding corporations. As indicated in Figure 8.2, 91% of the sample companies, 21 of 23, reached an agreement with their mother universities which allowed the companies to use the university name in front of the company name.

Figure 8.2 Relationship between the university and the company



As discussed in chapter 7, it was a pragmatic choice for university high-tech spin-offs to make use of universities' facilities, 'hard' capital such as land and buildings in particular, through a process of bargaining with the university authority at the start-up stage. In the process of restructuring spin-offs to shareholding corporations, university authorities and company leaders usually reached exclusive agreements regarding the further use of university facilities. As indicated in Figure 8.3, 65% of sample companies, 16 of 23, signed exclusive property agreements with their mother universities. The agreement often ended up with a tightening of the commercial links between the university and the company and as a result, the relevant rights and duties of the university as the ultimate owner of the company were mixed up with the assets and liabilities of the university as business partner of the company.

Figure 8.3 Relationship between the university and the company II



Box 8.4 Agreements between Huagong High-tech and HUST

1. Agreements on the use of land and property:

Huagong High-tech occupies a piece of land with the area of 4415.85 square meters in the campus of HUST. According to 'The Lease Agreement on Use Rights of Land' signed between Huagong High-tech and the university (HUST), the company uses the land for 30 years, paying 22,079 *yuan* annually to the university. Huagong High-tech and its branch company – Huagong Laser – make use of university buildings with an area of 1,250 square meters and 1,420 squares meters respectively. Huagong High-tech and Huagong Laser each signed 'The Lease Agreement on Buildings' with the university.

According to the agreements, Huagong High-tech and Huagong Laser use the buildings for 5 years with an annual rent of 83,833 *yuan* and 100,713 *yuan* respectively.

2. Agreements on intellectual property rights including patents, technological know-how and software patents:

Huagong High-tech and the university signed 'The Permission Agreement on Exclusive Occupancy of Patent, Technological Know-how and Software Patent'. According to this agreement, Huagong High-tech has *exclusive rights* over the use of patents, technological know-how and software patents that are owned by the university *free* of charge.

3. Agreements on further technological co-operation:

According to 'The Agreement on the Principles of Technological Co-operation', in order to provide technological support for the long-term sustainable growth of Huagong High-tech, the company will have priority in the use of the university's R&D outcomes in the fields of laser serial products (including anti-counterfeiting technology), software and IT, PTC, bio-engineering under an exclusive licensing agreement.

4. Agreements on social service:

Huagong High-tech signed 'The Agreement on Comprehensive Service' with the university. According to this agreement, the university will provide a full range of paid service including telecommunication, medical care, leisure & entertainment, safety & security, environment protection & cleaning and offer the company staff's children the places in kindergarten, primary and secondary schools attached to the university. According to 'The Agreement on Principles of Supplementary Service to Production', the university provides paid logistic service including water, electricity supply and other public engineering support to the company. According to both agreements, the university will charge the company the rate of service less than the market price to support the company's long-term development.

Instead of clarifying the rights and liabilities, the above agreements carried forward the legacy of fuzzy property rights that was the feature at the start-up stage of the development of spin-offs. Compared with the agreements reached through bargaining and negotiation between spin-offs initiators and the university at the start-up stage, the above agreements simply continued and institutionalised the *status quo* in the publicly listed company.

Source: compiled by the author with fieldwork record.

Almost all sample university companies are located in the regions receiving most government funding for S&T and high tech projects and are mainly engaged in ICT, computing science and biotechnology. As indicated in Table 8.2 and Figure 8.4, 10 companies engage in computing science and ICT sector, 2 companies specialise in

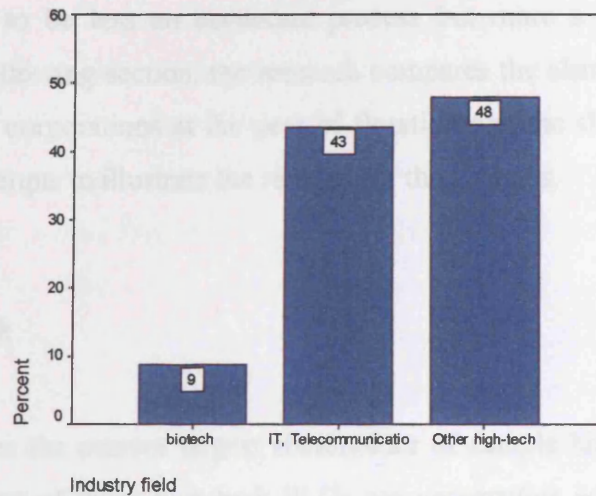
biotechnology and 11 of them get involved in various high-tech sectors in which they have accumulated comparative strength such as material technology. This research also discovers that the high-tech shareholding companies controlled by universities and research institutions based in Beijing and Shanghai were allocated more quotas for going public in general. It is particularly interesting to notice that leading universities based in Beijing and Shanghai were receivers of quotas granted to the higher education sector at the early stage of shareholding restructuring in the middle 1990s.

Table 8.2 : Leading University Spin-offs

	<u>City</u>	<u>Status</u>	<u>No. PLCs</u>	<u>Industries</u>
<u>Beijing University</u>	<u>Beijing</u>	<u>LC</u>	<u>4</u>	<u>ICT, CS, BT</u>
<u>Tsinghua University</u>	<u>Beijing</u>	<u>LC</u>	<u>2</u>	<u>ICT, BT, MT</u>
<u>Fudan University</u>	<u>Shanghai</u>	<u>LC</u>	<u>1</u>	<u>Mixed</u>
<u>Shanghai Transportation University</u>	<u>Shanghai</u>	<u>LC</u>	<u>2</u>	<u>Mixed</u>
<u>Tongji University</u>	<u>Shanghai</u>	<u>LC</u>	<u>1</u>	<u>BT</u>
<u>Zhejiang University</u>	<u>Hangzhou</u>	<u>LC</u>	<u>2</u>	<u>ICT</u>
<u>Nankai University</u>	<u>Tianjin</u>	<u>LC</u>	<u>1</u>	<u>MT</u>
<u>Tianjin University</u>	<u>Tianjin</u>	<u>LC</u>	<u>1</u>	<u>ICT</u>
<u>Dongbei University</u>	<u>Shenyang</u>	<u>LC</u>	<u>1</u>	<u>ICT, CS</u>
<u>Xian Transportation University</u>	<u>Xian</u>	<u>LC</u>	<u>1</u>	<u>ICT</u>
<u>Huazhong University of Sci.& Tech</u>	<u>Wuhan</u>	<u>LC</u>	<u>1</u>	<u>CIMS, MT</u>
<u>Wuhan Institute of Telecommunication Sci.</u>	<u>Wuhan</u>	<u>ML</u>	<u>1</u>	<u>ICT</u>
<u>Yunnan University</u>	<u>Kunming</u>	<u>LL</u>	<u>1</u>	<u>BT</u>
<u>Chinese Academy of Science</u>	<u>Various</u>	<u>ML</u>	<u>2</u>	<u>ICT, BT, MT</u>

(LC: Leading Comprehensive University under State Education Committee, ML: Leading University under direction of the Ministry, LL: Leading University under direction of Local government; ICT: Information Communication Technology, BT: Biotechnology, MT: Material technology)

Figure 8.4 Industrial sectors of university publicly listed companies



The above findings are aligned with the discussion in chapter 4 that the evolution of the government-industry-university partnership in the development of the high-tech industrial sectors since 1980s onwards demonstrates a *reconstructive downward* process in the development of high-tech companies from the state administrative and the collective legacy. The unique form of *university shareholding corporations*⁹ reflected the institutional arrangements of the transitional China with its features of reintroducing the market functions into the party/state governance structures with the political norm of the collective good, shaped both the evolution of the new institutional organisation and the nature of the market.

It was the university not the high-tech company that was able to get access to the source of quota for IPO flotation, either through the Ministry of Education, Ministry of Science & Technology or local government. The quota was allocated according to the central plan which favoured large sized state-owned enterprises and established traditional institutions; and the quota plan was reached through a compromise that balanced various interest groups of the central line ministries and bureaux and local governments. As a result, the education sector was marginally favoured in the distribution of quota and top ranked universities which held official status equivalent

to large sized SOEs were granted limited flotation quotas. The competition for the quota turned out to be less an economic process but more a political game and struggle. In the following section, the research compares the share structure of high-tech shareholding corporations at the year of flotation and the share structure in the year 2002 and attempts to illustrate the reasons for the changes.

8.2.2 Key findings

Table 8.3 indicates the current largest shareholder of sample high-tech PLCs. The largest shareholders of these high-tech PLCs are universities and R&D institutions from which these companies were originally born out as high-tech spin-offs. As an exception, the nature of shares held by the largest shareholders is transferable A share with Founder Tech and Jiaoda Tech. By contrast, the nature of shares held by the largest shareholders of the other 21 PLCs is more complex and vaguely defined.

There are five different titles of shares which are in use to describe the nature of shares held by the largest shareholders. In ascending order of ambiguity of state ownership these are: *State-owned*, *Designated & State-owned Legal Person*, *State-owned Legal Person*, *Creator State-owned*, and *Creator State-owned Legal Person*. These first three terms are used to refer to shares owned by the state or shares held by governmental agencies and authorised institutions on behalf of the state. The titles incorporating 'legal person' with 'state-owned' implies the possibility of designating rights of shares to the 'collective' groups, while the titles combining 'creator' and 'state owned' or 'state-owned legal person' entails the option of eventual individual holding of the shares. These titles were initiated to justify the group and individual benefits within an ideological framework which favoured state/public ownership. (In the first part of Appendix of this chapter, this research gives a through explanation on the legacy of state-owned legal person shares and creator state-owned legal person shares).

⁹ University Shareholding Corporation is a unique form of high-tech business organisation as the company is named after the university and the university is the largest shareholder of the corporation. For example, the Founder Group is fully addressed as 'Beijing University Founder Group'.

The research discovers that it is not unusual for the same shares, which were defined as 'state-owned shares' in a previous year's company annual report, to be changed as 'legal person shares' or 'creator legal person shares' in the next year's report, or, to be simply left undefined. The phenomenon demonstrates the ambiguity regarding the definition of shares and specification of rights and responsibilities associated with the definition of shares which had been left unresolved since the launch of shareholding reform in the early 1990s. The solution to the problem, as an exogenous issue, depends on the change of macro-institutional arrangements, which involves further lifting of political and ideological constraints and the evolution of market institutions. As an endogenous issue, its resolution relies on the bargaining power and vision of individual entrepreneurs¹⁰.

¹⁰ For instance, the process of defining the ultimate owner of Founder Group, which originated from Beijing University, has been going on for three years and remained unsettled so far.

Table 8.3: Largest Share Holders of 23 universities PLCs

	<u>Share Title</u>	<u>Shareholder</u>	<u>Percentage</u>	<u>Nature of Share</u>
1	Beijing University High-tech	Shenzhen Beijing University High-tech Investment Ltd	37.94	Designated & State-owned Legal Person
2	Zhong KeJian	Shenzhen KeJian Group Ltd ¹¹	29.01	Creator State-owned Legal Person
3	Nankai Guard	Tianjin Nankai Guard Group Ltd	47.38	State-owned Legal Person
4	Ziguang Guhan	Tsinghua Ziguang Group Ltd	21.44	State-owned
5	Tianjin University Tianjin Finance	Tianjin University	33.41	State-owned Legal Person
6	Zhejiang University HaiNa	Zhejiang University Enterprises Group Share Control Ltd	62.44	State-owned Legal Person
7	Tsinghua Ziguang	Tsinghua Ziguang Group Ltd	62.11	Creator State-owned
8	Huagong Science and Tech	Huazhong University of Science and Technology	67.95	State-owned
9	Qinniao Huaguang	Beijing University Qinniao Sci & Tech Ltd	25.41	State-owned
10	Tsing Hua TongFang	TsingHua University Enterprises Group	50.4	State-owned
11	Yunnan University Science and Technology	Yunnan University Science Industry and Trade Group	20.95	State-owned Legal Person
12	Founder Tech	Beijing University Founder Group	7.02	Transferable A Share
13	Fudan University Fuhua	Fudan University	32.74	State-owned Legal Person
14	Qinniao Tianqiao	Beijing University Qinniao Ltd	20.88	Legal Person
15	Jiaoda NanYang	Shanghai Transportation University	43.7	State-owned Legal Person
16*	China High-tech			
17	Zhejiang University WangXin	Zhejiang University Innovation Technology Co.Ltd	22.63	State-owned Legal Person
18	JiaoDa Tech	Xian Transportation University Enterprises Group	29	Transferable A Share
19	Tongji Science & Tech	Tongji University	45.16	Creator Legal Person
20	Flame Tech	Wuhan Institute of Telecommunication Sci.	70.49	State-owned Legal Person
21	Dong ruan Gufeng	Dongbei University Software Group Ltd	35.20	State-owned Legal Person & Public
22	Zhongke Yinghua	China Academy of Science Changchun Applied Chemistry Science Ltd	33.36	State-owned
23	Jiaoda Angli	Shanghai Transportation University	16.5	State-owned

¹¹ Shenzhen KeJian was originally a state owned subordinate unit of the Chinese Academy of Science.

*** Table of Shareholders of China High-tech on 2002-06-30**

Shareholder	Percentage	Nature of Share
Oriental Times Investment Ltd	28.24	Legal Person
Fudan University	5.15	Legal Person
Shanghai Transportation University Investment Management Group Ltd	0.28	Transferable A Share
Tongji University	2.92	Legal Person
Beijing Telecommunication University	2.41	Legal Person
Tsinghua University	1.55	Legal Person
Beijing University	1.37	Legal Person
Shanghai Foreign Language University	1.37	Legal Person

The question of fuzzy property rights has led to the difficulty of defining the nature of shares, thus leaving the rights of control and the ultimate owner of a company a perennial source of dispute. Figures 8.5 and 8.6 show the size of state-owned shareholdings in university PLCs at the year of flotation and 2002 respectively. The absolute amount of state-owned shares has decreased and the number of companies in which the state shareholding exceeded 50% has dropped from 8 to 2. Twelve of these university PLCs currently leave the question of 'state-owned shares' undefined, compared with only 4 at flotation. The findings show overall weakened state shareholding of these university PLCs. The fact that a large number of these PLCs currently leave the question of 'state-owned shares' undefined implies the possibility of changing the nature of 'state-owned shares' which is subject to the change of macro-institutional arrangements and the political judgement of decision-makers.

Figure 8.5: State-owned shareholding in the 23 university PLCs researched at year of flotation

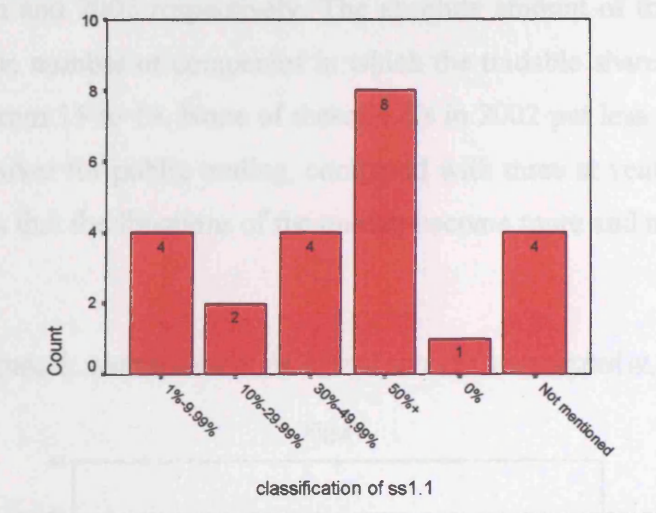
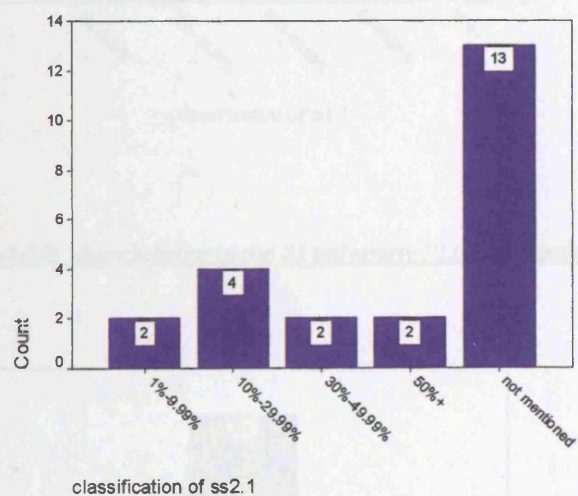


Figure 8.6: State-owned shareholding in the 23 university PLCs researched in 2002



Figures 8.7 and 8.8 show the size of tradable shareholdings in university PLCs at the year of flotation and 2002 respectively. The absolute amount of tradable shares has increased and the number of companies in which the tradable shareholding exceeded 30% has risen from 15 to 19. None of these PLCs in 2002 put less than 10% of their shares in the market for public trading, compared with three at year of flotation. The finding indicates that the functions of the market become more and more significant.

Figure 8.7: Tradable shareholding in the 23 university PLCs researched at year of flotation

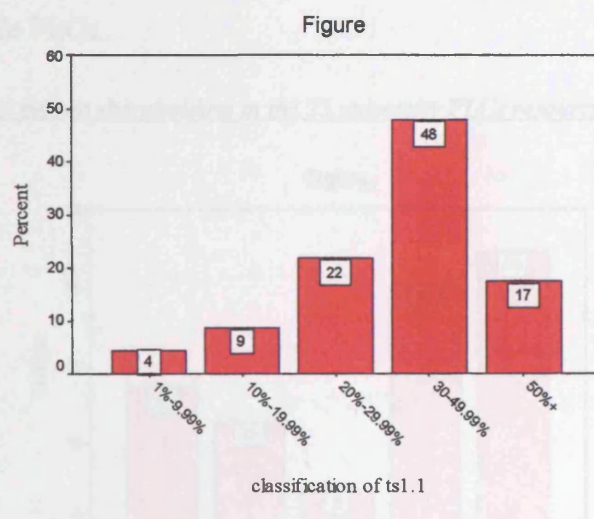
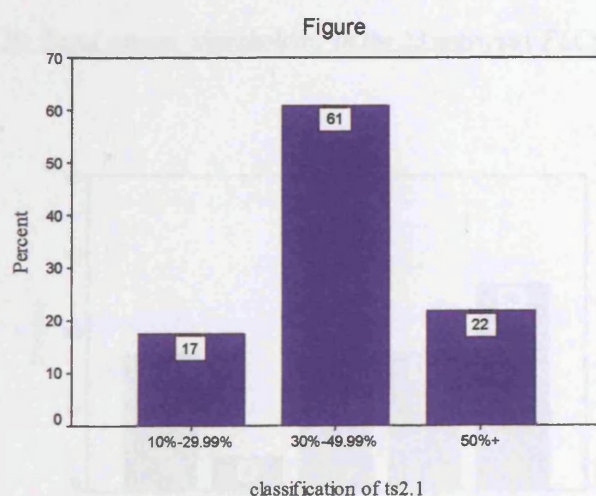


Figure 8.8: Tradable shareholding in the 23 university PLCs researched in 2002



Figures 8.9 and 8.10 show the size of legal person shareholdings in university PLCs at the year of flotation and 2002 respectively. Eight of these PLCs currently have 30-40% legal person shares of their total shares, compared with only one at the year of flotation. The number of companies with legal person shares accounting for less than 20% of their shares has dropped from seven to five. Eight of these PLCs left the legal person shares undefined at the year of flotation, compared with 6 in 2002. The finding indicates that the more vaguely defined legal person shares allowing more flexibility for the corporation to pursue group and individual interests, and that legal person shares are thus more welcome than the state-owned shares and adopted by a growing number of sample PLCs.

Figure 8.9 Legal person shareholding in the 23 university PLCs researched at year of flotation

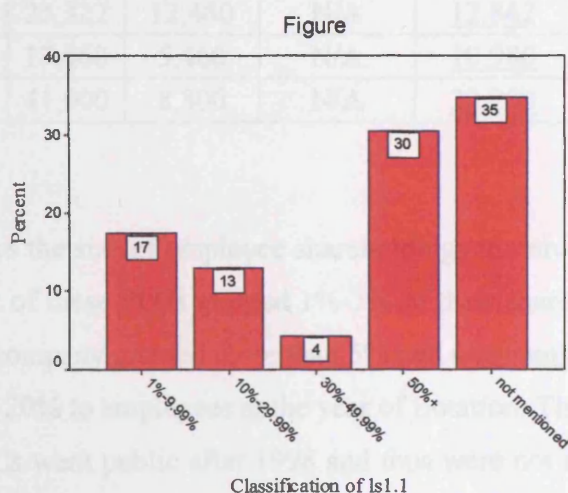
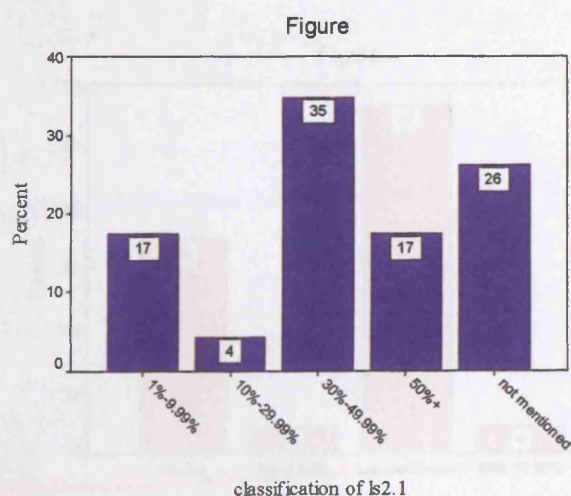


Figure 8.10: Legal person shareholding in the 23 university PLCs researched in 2002



In Table 8.4, the underlined blue numbers show the amount of legal person shares in five university PLCs in 2001. One year later, in two of these companies, the same amount of shares were no longer classified as legal person shares but listed under the category of creator share, while three of them simply left the largest part of shares undefined which implied that the ongoing attempts of changing the nature of legal person shares.

Table 8.4 The flexibility of legal person shares (unit: 10,000)

	Total	A	State-owned	Legal Person (2001)	N/A (2002)	Creator (2002)
Nankai Guard	40614	16,622	N/A	<u>19,244</u>		<u>19,244</u>
Tsinghua Ziguang	20,608	6400	N/A	<u>14,208</u>	N/A	
Qinniao Huaguang	25,322	12,480	N/A	<u>12,842</u>		<u>12,842</u>
China High-tech	17,460	5,460	N/A	<u>10,980</u>	N/A	
Flame Tech	41,000	8,800	N/A	<u>32,200</u>	N/A	

Figures 8.11 shows the size of employee shareholdings in university PLCs at the year of flotation. Eight of these PLCs granted 1%-5% of their shares to employees at year of flotation. One company granted more than 5% and one company granted more than 10% but less than 20% to employees at the year of flotation. The finding indicates that most of these PLCs went public after 1998 and thus were not allowed to grant shares to employees owing to changes in CSRC regulations.

Figure 8.11 Employee shareholding in the 23 university PLCs researched at year of flotation

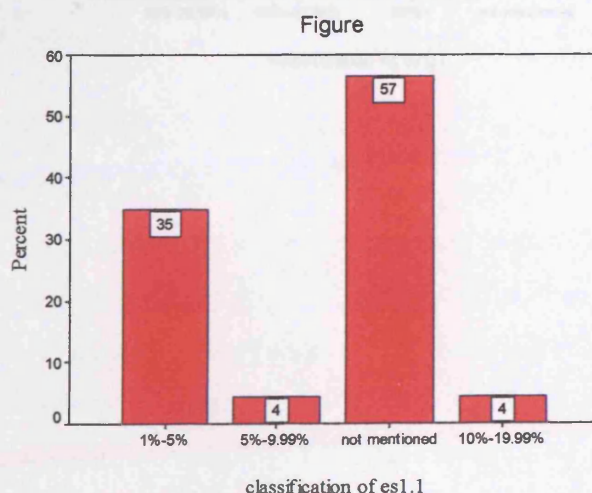
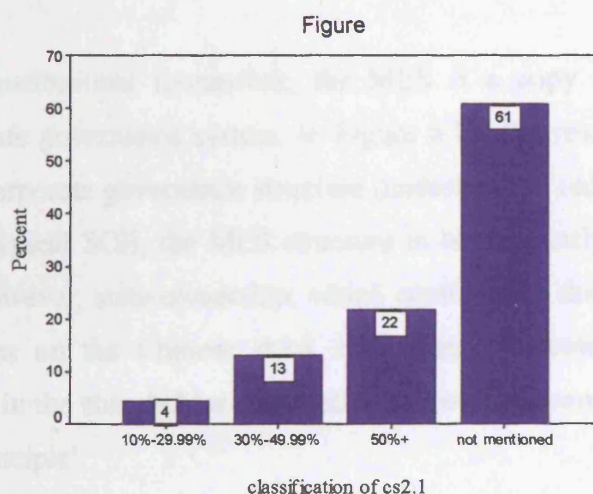


Figure 8.12 shows the size of creator shareholdings in university PLCs currently. It is interesting to notice that, none of these university PLCs specified the creator shares at the year of flotation. For those companies who went public before 1998, the creators received individual shares under the category of employee shares; there were a few exceptions when some creators decided not to take employee shares because of their individual political prudence. According to the findings, the absolute amount of individual creator shares has increased significantly and the number of companies in which the creator shareholding exceeded 50% has risen from 0 to 5. Three of sampled PLCs currently grant 30%-40% of their shares to creators, one of them grants between 10% and 30% of their shares to the creators. Compared with the significant decrease in the absolute amounts of state-owned shares, the increase of the scale of creator shares indicates clearly the growing extent of privatisation albeit covert in these university PLCs.

Figure 8.12: Creator shareholding in the 23 university PLCs researched currently



8.3 Question of Corporate Governance within PLCs

8.3.1 The absence of the ultimate principle and the formation of networking executives

Aligned with shareholding restructuring, the ‘modern enterprise system’ (MES) was introduced as the new governance institution. According to official Chinese discourse, the principal characteristic of the ‘modern enterprise system’ is the separation of the rights of ultimate ownership from the *legal person property right* of the enterprise. The independent and enforceable legal person property right is the expected outcome of the separation. The institutions of the ‘modern enterprise system’ (MES) within the SOEs are established on a multi-agency relationship: the government-authorised investor representative exercises the rights of ultimate owner including the entitlement to the rights of investment rewards, decision-making and the selection of management associated with shares (investment contributions) while the SOE managers are granted legal person property rights of autonomy of management.

In terms of the institutional framework, the MES is a copy of the shareholder perspective corporate governance system. In Figure 8.13, the research compares the Anglo-American corporate governance structure (underlined in red) with the structure of MES within a typical SOE; the MES structure in black clearly overlaps with the benchmark red. However, state ownership, which continues to dominate the majority of listed companies on the Chinese stock exchanges, illustrates the fundamental conflict embedded in the shareholder perspective corporate governance – the absence of the ‘ultimate principle’.

As indicated in Figure 8.13, in the Shanghai State Assets Management System, the State Asset Committee (SAC) acts as the first level agent and exercises the right of appointing the second level agents, including two state asset holding institutions – the State Asset Operating Companies (SAOC) and the State Asset Group Companies (SAGC)- and one supervising institution – the State Asset Management Office (SAMO). The two holding institutions, SAOC and SAGC, must sign a performance contract with the supervising body, SAMO. The managers of operating entities (the

SOEs) are entitled to legal person property rights claiming fourteen separate rights in relation to the SAOC and SAGC in defence of their autonomy of management.

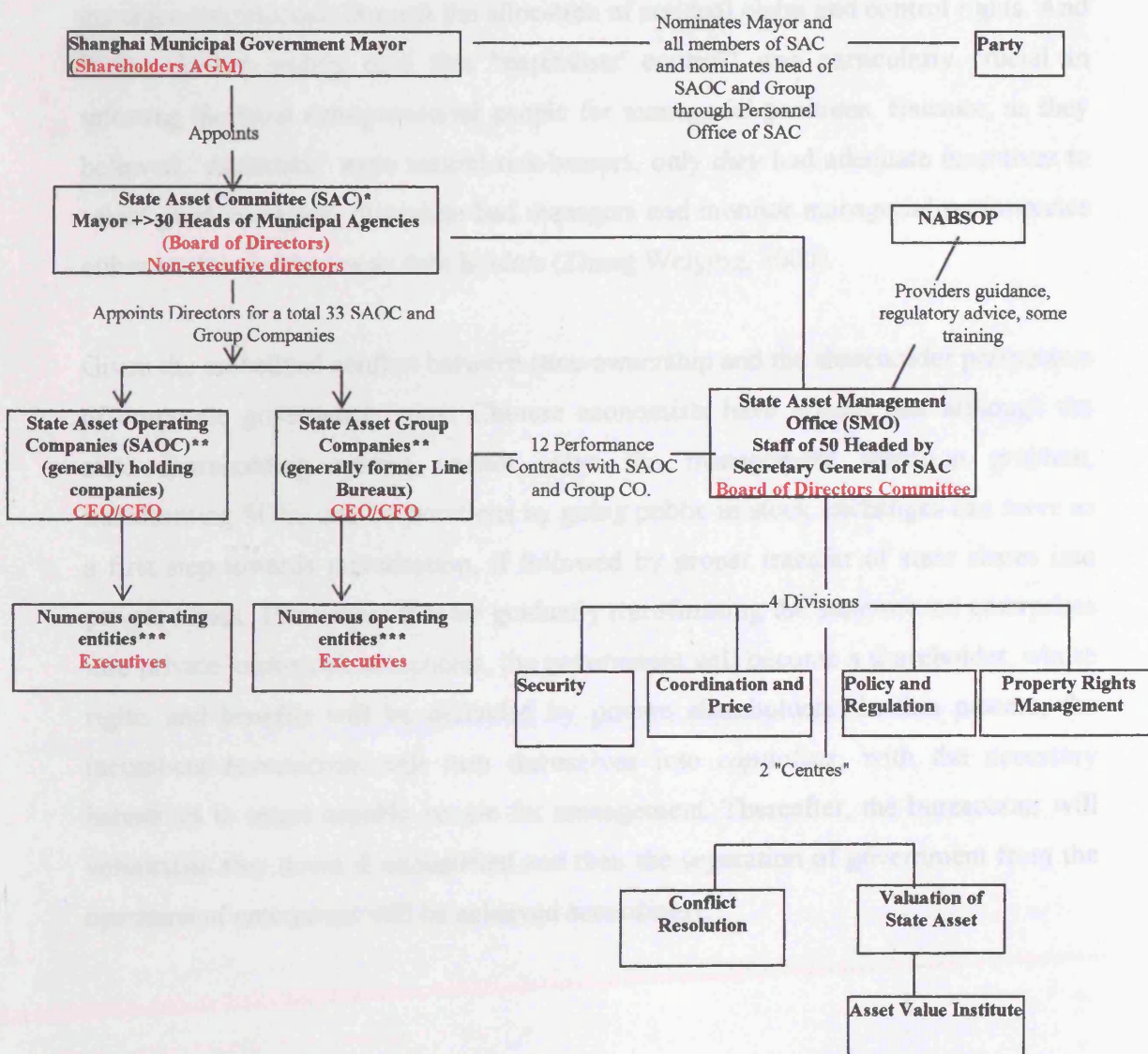
In this model, the State Assets Committee represents the ultimate shareholders. The SAOC and SACG, previously line bureaucrats, become the board of directors of the shareholding company while their heads act as non-executive directors, making strategic decisions and exercising the rights of monitoring, appointing and dismissing managers of the operating entities. The latter, who are granted autonomy in daily activities, also sit as executive members of the board of directors. This model thus represents an integration of the Anglo-American model of corporate governance into the *extant administrative hierarchy*.

And the distribution of power in this model is based upon the previous administrative hierarchy of command. At the top, the mayor and heads of municipal agencies sit on the State Asset Committee and exercise the power of appointment to state holding companies, transformed from previous line bureaux. The model simply reproduces the previous hierarchical relations between the 'city headquarters' and line bureaux, but under a new corporate title. At the second level, the State Assets Management Office (SAO), comprising four divisions and two centres, is designed to act as the supervising body but the SAO and the two holding institutions hold the same hierarchical rank and power as they used to do under the old command relations. And at the bottom of the system are enterprises reporting to two holding institutions in the same way they used to report to line bureaux in the previous system.

Under this new multi-agency arrangement, the various government authorities have been streamlined into two levels of representatives, reducing the number of middle level agents. However, the separation of investor-representative (representing owner) and legal person property rights (control of the enterprise) has not solved the classic problem of corporate governance. Under this system, the government-authorised investor-representatives are mere representatives who exercise the rights of the ultimate owner, while the ultimate owner, *all* the people, remains absent. And the incentives for representatives to select capable enterprise managers and supervise their behaviour remain weak.

Only managers are entitled to the right of control and distribution of income; nominal owner employees are neither entitled to any right of control over the distribution of benefits associated with the legal person property rights nor empowered to pursue such rights under *status quo ante*. However, neither the representative nor the manager would undertake the duty or liability if the depreciation of the ultimate owner's net asset occurred; it would be nominal owners - *all* employees - to underwrite the liabilities of the enterprise. With the fundamental reliance on the power hierarchy of the *status quo ante*, this arrangement has simply enlarged the 'asymmetry' between the legal person property rights granted to managers and the duties and responsibilities that are shouldered by all employees.

Figure 8.13: A Comparative Case of Shanghai State Asset Management System and Anglo-American Corporate Governance Model



The "operation entities" claim the 14 rights against the holding Company Group level

- * 60 percent of state assets on Shanghai under this SAC, while 30 percent under management of identical structures at District level. Remainder not allocated to either.
- ** Functions include administration of sector, management and operations, and performance supervision. Each SAOC and Group is organized vertically on a sector bases.
- *** Entities at the operating level total more than 15,000.

Source: The Shanghai system from the World Bank (1997) in Zhang Weiying (2000); the flow in red compiled by authors.

Given the increasing dominant view inside China that was hostile to the dominance of state ownership, the absence of the ultimate principle was emphasised and complete privatisation was regarded as the ultimate solution to enterprise reform. It was widely believed and accepted as the new doctrine that corporate governance was a mechanism assumed to address both the problems of managerial incentives and management selection through the allocation of residual claim and control rights. And it was further widely held that "capitalists' control" was particularly crucial in selecting the most entrepreneurial people for managerial positions. Because, as they believed, 'capitalists' were natural risk-bearers, only *they* had adequate incentives to select good managers, discipline bad managers and monitor managerial performance either as shareholders or as debt holders (Zhang Weiying, 2000).

Given the embedded conflict between state ownership and the shareholder perspective of corporate governance, some Chinese economists have argued that although the state shareholding system cannot solve the management selection problem, transforming SOEs into corporations by going public in stock exchanges can serve as a first step towards privatisation, if followed by proper transfer of state shares into private hands. They argue that by gradually transforming the state-owned enterprises into private joint-stock companies, the government will become a shareholder, whose rights and benefits will be defended by private shareholders. In this process, the incumbent *bureaucrats* will turn themselves into *capitalists*, with the necessary incentives to select capable people for management. Thereafter, the bureaucrats will voluntarily step down if unqualified and then the separation of government from the operation of enterprises will be achieved accordingly.

But scholars and decision makers who favour the above dominant arguments neglected that the impact of incentives on the behaviour of agents, defined by the opportunities afforded to them by the institutional structure of society. Agents, as well as other organisations, are purposive entities. Bureaucratic agents' behaviour is not static and immutable and proper analysis of economic change thus requires an understanding both of officials as economic actors and of the varying incentives, constraints, and resources that shape their opportunities and choices (Qian & Weingast 1997:83-92). The unexpected outcome of the dominant arguments was that bureaucrats were much more motivated to transform themselves into capitalists *per se*, rather than the entrepreneur capitalists that were originally hoped for. As a result, the efficiency of the enterprise is the last thing to be considered in such a game.

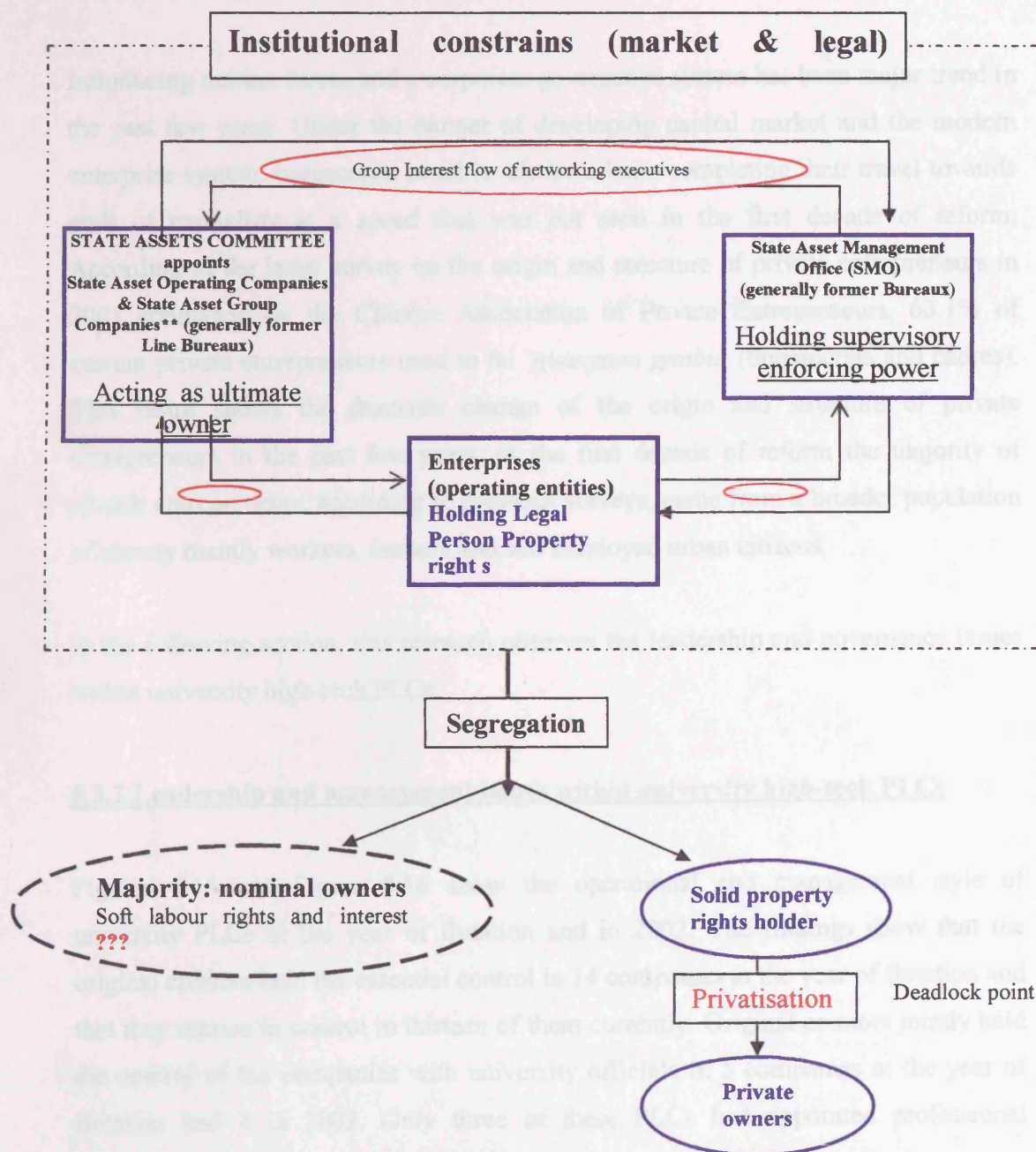
Moreover these dominant arguments neglected the demands and interest of the majority. The choice between efficiency and equality has always been quoted to justify the privatisation perspective, in which the priority was given to efficiency of the shareholder perspective and the rationale of 'trickledown effect' was adopted to support these arguments.

As stated above, the assignment of rights was allocated by traditional norms of behaviour through the extant administrative hierarchy rather than being defined and enforced through an institutional mechanism with legal force. Rights are assigned simply by administrative power, a process that, from the beginning, has lacked the formal legal constraints of duty and liability. Given the nature of incompleteness of law, the more complex the exchange and the larger its economic scale, the more necessary is it to have complex and credible institutions acting *impartially* as third parties in policing and enforcing agreements (North 1990).

As happened in both performance and co-operative shareholding reform, there were unanticipated outcomes of the re-structuring implemented in the model indicated in Figure 8.13. In Figure 8.14, we show that, the State Asset Group Companies (SAGC), SAOC and SMO, which were former line bureaux, exercised the essential rights of the ultimate owner while enterprise managers maintained autonomy of the enterprise by claiming fourteen legal person property rights. But without a functioning corporate

governance mechanism, the 'networking executives' who held solid property rights accumulated substantial wealth while the nominal ownership rights were infringed.

Figure 8.14: The flow of ownership and legal person property rights after incorporation and shareholding reform



Source: compiled by the author

In the above system, although the publicly listed companies, their holding organisations and the supervisory organisations represent the respective interests of the bureaucratic systems to which they belong, their intertwined political and

economic interests lead inevitably to collusion among ‘networking executives’ of the holding institutions, the publicly listed companies and their governing bodies. It is somehow inevitable that the bulk of the collusive activity took place in the grey area of law and regulations once many previous restrictions were lifted and rules modified in the name of ‘promoting reform and opening economic development’.

Introducing market forces and a corporate governance system has been major trend in the past few years. Under the banner of developing capital market and the modern enterprise system, bureaucrats at all levels have been completing their travel towards ends of capitalists at a speed that was not seen in the first decade of reform. According to the latest survey on the origin and structure of private entrepreneurs in 2003 conducted by the Chinese Association of Private Entrepreneurs, 63.1% of current private entrepreneurs used to be ‘*guanyuan ganbu*’ (bureaucrats and cadres). This result shows the dramatic change of the origin and structure of private entrepreneurs in the past few years; in the first decade of reform the majority of private entrepreneurs, according to previous surveys, came from a broader population of society mainly workers, farmers and self employed urban citizens.

In the following section, this research observes the leadership and governance issues within university high-tech PLCs.

8.3.2 Leadership and management issues within university high-tech PLCs

Figures 8.15 and Figure 8.16 show the operational and management style of university PLCs at the year of flotation and in 2002. The findings show that the original creators held the essential control in 14 companies at the year of flotation and that they remain in control in thirteen of them currently. Original creators jointly held the control of the companies with university officials in 5 companies at the year of flotation and 4 in 2002. Only three of these PLCs had appointed professional managers to run the business by 2002.

Figure 8.15: Management and control in the 23 university PLCs researched at the year of flotation

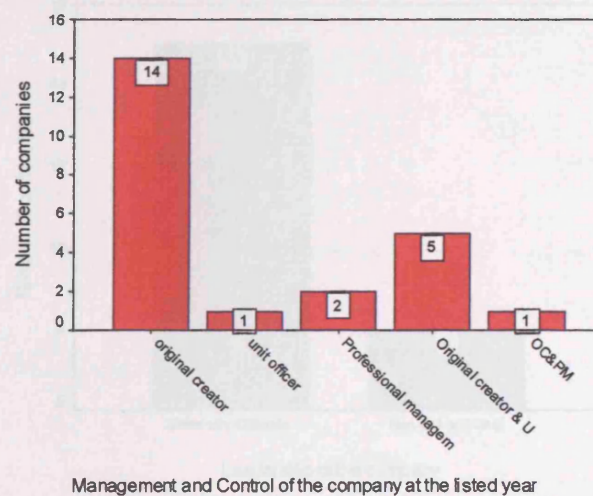


Figure 8.16: Management and control in the 23 university PLCs researched in 2002

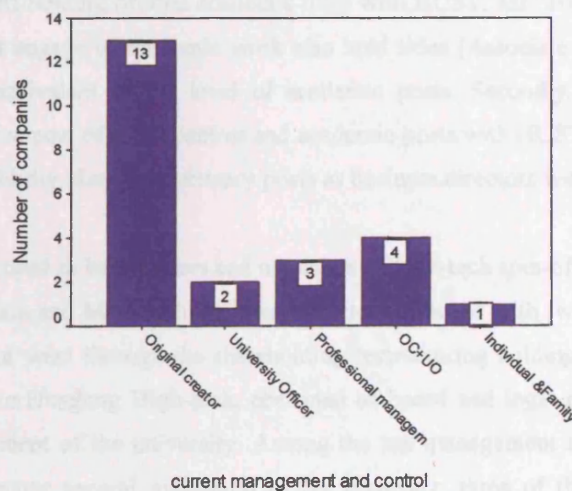
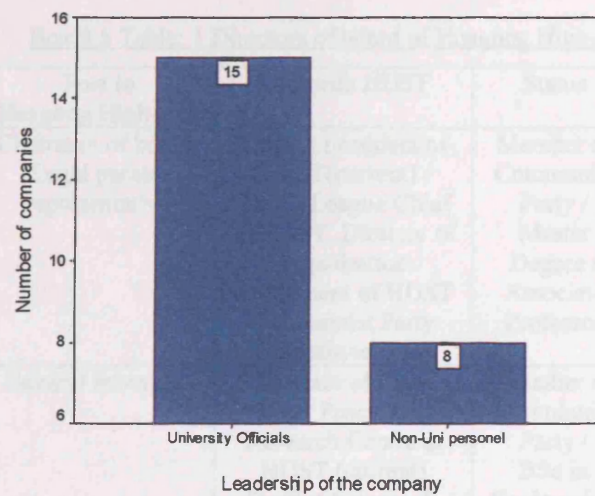


Figure 8.17 shows the status of the current leadership, the chairmen of the PLCs, of these university PLCs. In fifteen of them, university officials act as the chairmen of the PLCs which non-university personnel are chairmen of the other eight PLCs.

Figure 8.17: Leadership in 23 university PLCs researched in 2002



Box 8.5 Corporate Governance Structure within Huagong High-tech

As indicated in following table, as the largest shareholder of Huagong High-tech, nine out of eleven directors of the board are formal employees serving HUST over a long period of time. These nine HUST directors have more than one post with HUST. Firstly, they are all formal full-time staff holding official academic titles with HUST; Mr. Tong Jun and Mr. Liu Daqiao who did not engage in academic work also hold titles (Associate Research Fellow & Senior Engineer) equivalent to the level of academic posts. Secondly, some of them hold both administrative post of R&D centres and academic posts with HUST, the typical case is Mr. Li Zhengjia. Thirdly, they hold primary posts as business directors within Huagong High-tech.

Six of them used to be initiators and managers of high-tech spin-offs and Mr. Zhang Zhaoqun, Ms. Cao Yulin and Mr. Li Zhengjia are directors of board with two further more independent spin-offs that went through the shareholding restructuring holding legal person status. In the conglomerate Huagong High-tech, chairman of board and legal person representative is the deputy president of the university. Among the top management team (one general manager and four deputy general managers) of the company, three of them (general manager Ma, deputy general managers Wang and Tong) had more experience as university party /administrative cadres. Ma and Wang had successfully operated factories attached to the university and had thus gained bargaining power in the distribution of positions after the merge.

With regard to political status, seven out of nine HUST directors are members of CCP, while three younger members had working experience as league (youth branch of communist party) cadres. They grew as entrepreneurs grown out of the party/state hierarchy, hence the

incentives and constraints of the old system remaining functional as they pursue the business adventures.

Box 8.5 Table: 1 Directors of board of Huagong High-tech

Name / Age	Post in Huagong High-tech	Post with HUST	Status	Post in spin-offs
Mr. Wang Yanjue 42	Chairman of board, Legal person representative	Deputy president of HUST(current) / Youth League Chief of HUST, Director of organisation department of HUST Communist Party Committee (Pre)	Member of Communist Party / Master Degree / Associate Professor	General manager of HUST Science & Technology Development General Co., (pre.)
Mr. Ma Xingqing 34	General manager,	Director of State Laser Processing Research Centre at HUST (current) Staff of Science & Technology Development Office (pre.)	Member of Communist Party / BSc in Engineering from HUST	General Manager of Cooling Equipment Factory HUST (pre.) Sales manager of Gaoli Electronic (pre.)
Mr. Zhang Zhaoqun 67	Deputy General Manager, Vice Chairman of the board	Professor with telecommunication department of HUST	Member of Communist Party	Vice Chairman of board & General / Legal person representative Manager of Huagong Image (pre.)
Mr. Li Zhengjia 54	Chairman of board of HUST Laser Ltd (branch of Huagong High-tech)	Professor in Laser Engineering, / Phd supervisor / Receiver of special bonus for experts from State Council / Director of State Key Engineering Research Centre of Laser Processing (located in HUST) / Head of Laser Technology and Engineering at HUST	Member of Communist Party / Executive Member of Chinese Laser Industry Association	Deputy Director of Laser R&D cluster with HUST (pre.) / Party secretary of Laser Research Centre
Mr. Liu Daqiao 42		General Manager of HUST Printing Factory / Senior Engineer	Member of Communist Party	League secretary of HUST Press (pre.) / Production director, quality control manage with HUST Printing Factory (pre.)
Dr. Cheng Zhuoling 42	Deputy General Manager	Professor in computing science with HUST		Executive Director & General Manager of Kaimu Software (pre.)
Mr. Wang Zhong 35	Deputy General Manager of Huagong High-tech & Director of board, Deputy General Manager of Huagong Laser Ltd.	Master Degree from HUST/ Senior Engineer with HUST	Member of Communist Party	Secretary of party committee office with HUSY (pre.) / League secretary of postgraduates with HUST (pre.)

Mr. Tong Jun 37	Deputy General Manager & Company Secretary	Associate Research Fellow with HUST	Member of Communist Party	League secretary of HUST (pre.), Deputy director of Science & Technology Development Office with HUST (pre.) / Deputy General Manager of S&T General Company HUST (pre.)
Ms Cao Yulin 49		Senior Engineer with HUST		Lecturer with telecommunication Department of HUST (pre.) / Director of board, deputy general manager of Huagong Image (pre.)
Mr. Huang Jiamin	Non HUST staff			
Mr. Mei Jingming				

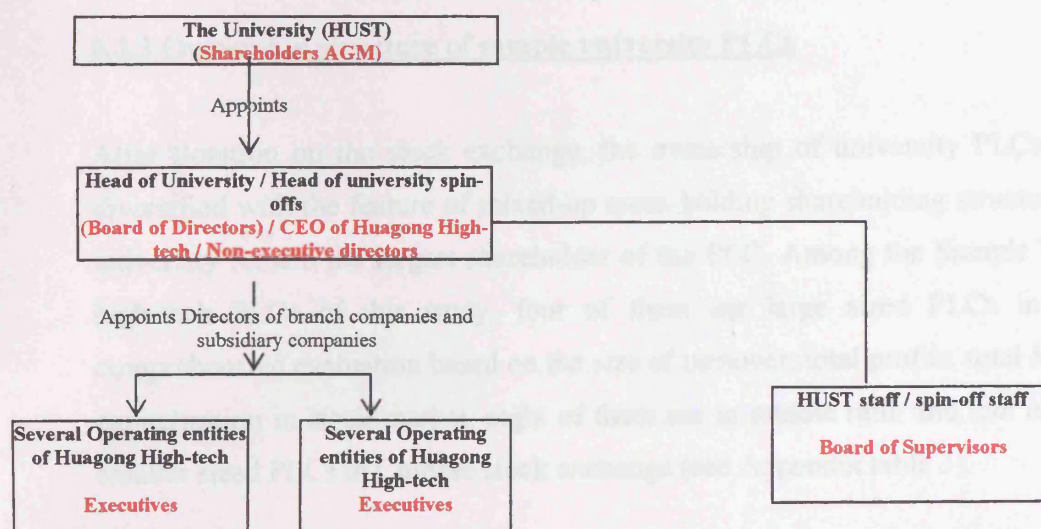
The structure of the board of supervisors is the same as the board of directors in the sense that all seven supervisors hold more than one post with HUST. As indicated in the following table, compared with directors of board, supervisors are either junior in terms of administrative & academic rank with HUST or the deputy to initiators and managers in previous spin-offs. Mr. Li Jia is the deputy to Director Li Zhengjia. Mr. Wang Shuchu was the number 3 in Huagong Image only junior to Directors Zhang Zhaoqun and Ms. Cao Yulin in Huagong Image. Mr. Huang Pei was the deputy to Director Cheng Zhuoling in Kaimu Software. Mr. Lai Xiwei was deputy to Directors Ma Xingqiang and Wang Zhong in Gaoli Electronic. Five out of seven supervisors are communist party members.

Box 8.5 Table 2: Members of the board of Supervisors with Huagong High-tech

Name / Age	Posts in Huagong High-tech	Posts with HUST	Status	Post in spin-offs
Mr. Zhu Guangxi 54	Chairman of board of supervisors / Legal person representative & General Manager of Wuhan Hongxiang Image (one of initiators of Huagong High-tech)	Director of Electronic & Information Engineering Department of HUST / Deputy director of the college of media of HUST (current) Professor, PhD supervisor	Member of Communist Party / Deputy director of Hubei Telecommunication Association Multi-media Branch	Legal person representative & General Manager of Wuhan Hongxiang Image (initiated as a spin-off of HUST as well)
Mr. Sun Jianli 56	General Manager of HUST Mechanic & Electronic Engineering Ltd (one of initiators of Huagong High-tech)	Deputy director of College of Mechanic Engineering of HUST (current) / Professor, PhD supervisor	Member of Communist Party /	Director of Research Centre of Refinery Machine of HUST (pre.) / Director of board, General Manager of Guangdong Xinghui Kaite Refinery Machine Ltd. (pre.)

Ms. Dai Baoyu 54		Director of Finance & Assistant to President of HUST (current)	Member of Communist Party	League secretary of Mechanic Department of HUST (pre.)
Mr. Li jia 62	General Engineering of HUST Laser Ltd (branch of Huagong High-tech)	Professor in Laser Engineering, Receiver of special bonus for experts from State Council / Director of State Key Engineering Research Centre of Laser Processing (located in HUST) / Head of Laser Technology and Engineering at HUST	Member of Communist Party / Member of Chinese Laser Processing Engineering Association	Deputy Director & Deputy General Engineer of State Key Engineering Research Centre of Laser Processing (located in HUST) (pre.)
Mr. Wang Shuchu 51		Senior Engineer	Member of Communist Party	Director of board & General Engineer with Huagong Image (pre.)
Mr. Lai Xiwei 53		Professor		General Engineer with Gaoli Electronic (pre.)
Mr. Huang Pei 28		Phd of HUST		Deputy General Manager with Kaimu Software (pre.)

Box 8.5 Figure 1: Corporate Governance Model in Huagong High-tech



As indicated in the above Figure, the university authority holds unconditional power in the publicly listed company. Given the feature of 'dual - status' (status as both university staff and PLC staff) of Huagong High-tech staff - members of the board of directors, member of

board of supervisors, CEO and executives, first of all, are subject to the administrative governance of the university and those who are party members are also confined by party discipline. The extant party/state governance is intertwined with the imported corporate governance in the sense that *Huagong High-tech adopts the corporate governance structure but rely on party/state power to enable the board of directors and board of supervisors to function.*

The university authority not only made decision regarding the distribution of money raised through IPO among branch and subsidiary companies of Huagong High-tech but also had the final say with regard to strategic decisions on such issues as further investment projects including mergers and take-overs. It used to be the spin-offs managers who made such strategic decisions. Previous successes of spin-offs prove that the autonomy of management is the most crucial right that should be granted to managers who have more knowledge in the industrial field. At early stage, the university authority had no substantial rights and power to interfere in the management of spin-offs, however, after flotation, the university authority gained solid rights to manage the company directly as the largest shareholder of Huagong High-tech. According to one interviewee, in a company meeting on the discussion of potential investment fields, although most managers were against it, it was the choice of the head of university that finally got through. Nobody challenged to the decision which in the not-too-distant-future turned out to be a failure. The cultural feature of high power distance in Chinese organisations combined with party/state governance structure to some extent acted as a countervailing (force) to the rationale of western corporate governance model.

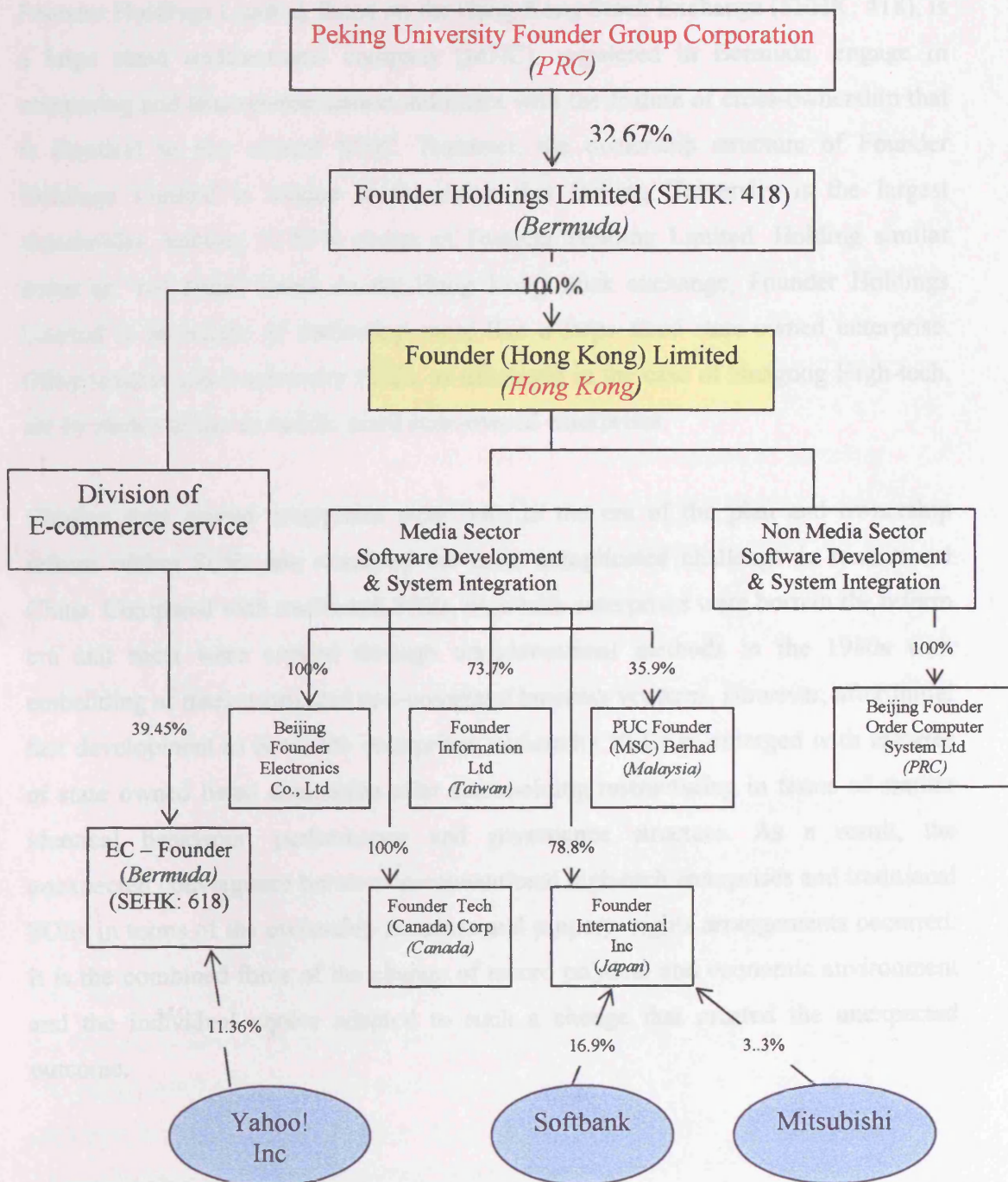
8.3.3 Ownership structure of sample university PLCs

After flotation on the stock exchange, the ownership of university PLCs has been diversified with the feature of mixed-up cross-holding shareholding structure, but the university remain the largest shareholder of the PLC. Among the Sample University high-tech PLCs of this study, four of them are large sized PLCs in terms of comprehensive evaluation based on the size of turnover, total profits, total assets, and capitalisation in stock market, eight of them are in middle rank and ten of them are smaller sized PLCs in Chinese stock exchange (see Appendix table 3).

The following Figure 8.18 indicates the ownership structure of a typical large sized university PLC – Beijing University Founder Group Corporation¹².

¹² The start-up development of this company is addressed in chapter 6.

Figure 8.18: The ownership structure of Peking University Founder Group Corporation



Founder Holdings Limited, listed on the Hong Kong Stock Exchange (SEHK: 418), is a large sized multinational company (MNC), registered in Bermuda, engage in computing and telecommunication industries with the feature of cross-ownership that is identical to any current MNC. However, the ownership structure of Founder Holdings Limited is unique in the sense that Beijing University is the largest shareholder, holding 32.67% shares of Founder Holding Limited. Holding similar status as 'red chips' listed on the Hong Kong stock exchange, Founder Holdings Limited is by nature of ownership more like a large sized state-owned enterprise. Other smaller sized university PLCs, as discussed in the case of Huagong High-tech, are by nature closer to middle sized state-owned enterprises.

Chinese state owned enterprises were born in the era of the plan and ownership reform within SOEs has remained the most complicated challenge in transitional China. Compared with traditional SOEs, high-tech enterprises were born in the reform era and most were created through unconventional methods in the 1980s with embedding of market-oriented non-command business ventures. However, after initial fast development as non-state enterprises, university PLCs re-emerged with features of state owned listed companies after shareholding restructuring in terms of similar identical behaviour, performance and governance structure. As a result, the unexpected convergence between unconventional high-tech enterprises and traditional SOEs in terms of the ownership structure and property rights arrangements occurred. It is the combined force of the change of macro political and economic environment and the individual choice adapted to such a change that created the unexpected outcome.

Appendix of Chapter 8: Data

A.1 Construction of the Database

The data contains 23 university high-tech PLSs (HPLCs), which are closely linked to universities and state research institutions. The 23 HPLCs are currently listed among the top 100 high-tech scientific publicly listed corporations by the end of 2001.

All samples are shareholding corporations listed and partially traded on Shanghai Stock Exchange (SHSE), Shenzhen Stock Exchange (SZSE) and Hong Kong Stock Exchange (HKSE). The data on all the companies included in this research project obtained from the China Securities Regulatory Commission (CSRC) official database. The CSRC is the executive regulator of the Chinese securities industry. Its regulations require that all publicly listed companies should ensure the availability of relevant data to the general public. Therefore, compared with non-listed corporations, publicly listed companies provide more comprehensive data covering a broader range and are moderately more reliable as the data are supposed to be under public supervision. This is one of the reasons that samples of listed companies with accessible data opened to public domain are deployed for this research.

Publicly listed companies are classified as Large and Medium sized enterprises. The 2001 turnover of the 23 HPLCs included in this study ranged from 60 million *Yuan* to over 9 billion *Yuan*. According to the classification of the Chinese statistic Bureau, these 23 HPLCs are either ‘Large sized firms’ or ‘Medium sized firms’. The study excludes small sized and non-publicly listed HPLCs. The selection criteria may be interpreted as creating a potential sample bias as it excludes both non-publicly listed and small sized HPLCs. However, this was excluded as a result of the historical problems that have remained within the stock markets originating from the ‘dual track – the combination of plan and market’ transition.

The Chinese government has used security markets to achieve objectives such as rescuing the ailing SOEs, achieving sectional and regional balances of development and mobilizing resources for specific purposes. The quota of annual stock issuance was one of the momentous means to achieve such objectives. The process of quota distribution across regions and the line industries was central planned and thus highly

political by nature. The annual stock issuance plan and the associated cumbersome approval procedures favoured the larger sized enterprises, which were listed either by regional government or line industry as ‘pillar’ corporations.

Before 2001, when a company applied for flotation on the stock market in China, one of the qualifications set by the CSRC was that the total assets of the applicant must exceed 300 million *Yuan*. Unlike mature stock markets such as the London Stock Exchange which offers the chance for flotation of smaller enterprises through the Alternative Investment Market (AIM), the newly established Chinese security market has not yet provided flotation channels for small businesses. Strategic merger and acquisition was therefore adopted by many small sized companies and, consequently resulted in the dominance of large and medium sized companies in the Chinese stock exchanges.

This chapter uses the secondary data of HPLCs clusters on SHSE & SZSE and attempts to identify the change of ownership patterns and the ultimate control of these companies. The research relies primarily on the *company report* of every publicly listed company provided by CSRC security information data centre. The Chinese government mandates disclosure of 5 % ownership stakes. In the company report, there are two specific columns of data that this research collects for observation and analysis – ‘Top 10 shareholders’ and ‘Share Structure’. The company report not only provides the current information with regard to the ownership structures of the company but also offers the historical annual data since the year the company went public. It includes road show & green-shoe documents of the company which often provides information and data of the company when it started from scratch. As a result, the change of ownership structure before flotation can be traced back to the time when the company was originally established.

The INTERNET was found to be very useful because all HPLCs, as well as their mother universities and R&D institutions have maintained regularly updated websites on which information with regard to the change of ownership structures are frequently released as headlines. Historical information and data can be accessed from on-line archives. In addition to the resources mentioned above, research papers on sample companies published by leading financial newspapers, magazines and journals were

also collected for this research. The problem was that information collected from one source frequently contradicted information from other sources. When the difference occurred, this research used the data from the government-approved sources.

A powerful search engine provides a colossal amount of relevant research on sample companies. However the research coverage of each sample company differs significantly. More information and more profound consistent research are available with regard to the larger the size of the company of more high-profiled higher ranked universities. There are also more information and data regarding companies engaged in IT hardware and telecommunication sector than those in other less 'trendy' sectors. Information disclosure of several companies such as *Fudan Fuhua*, *YunDa Keji* is comparatively limited.

Given that companies floated at different time during the period from 1994 to 2000, the ownership data of companies at the year of flotation varied significantly. The ownership patterns kept changing in the last 10 years. Some patterns that existed in the early stage of stock market reform disappeared in later years. As a result, some patterns that identified within the sample companies floated in the early 1990s did not exist in the companies floated in the end of 1990s. The typical case is the category of employee shares that existed in the companies which went public before 1998. Given the rampant arbitrage behaviour in the process of distribution and trade of employee shares, CSRC discontinued the distribution and trading of employee shares in companies which went public after the issue of relevant CSRC decisions in 1998.

Some earlier patterns were reclassified at a later stage, however the essential connotation remained similar in the later cases. The changing definition and patterns of ownership structure over time raises the potential statistical bias to the proper interpretation of the findings of the research.

Appendix table 1: Share structure of sample high-tech PLCs on 2002-06-30

	Total	A	State-owned	Legal Person	Employer	A. <i>Cr ea to r</i>	B	H
1	8,397	4,165	N/A	N/A	N/A	3,808		
2	11,588	4,264	3,361	3,962 ¹³	N/A	N/A		
3	40614	16,622	N/A	<u>19,244</u>	N/A	<u>19,244</u>		
4	20,302	6,355	4,178	2,346	4,352	N/A		
5	12,275	6,100	N/A	N/A	N/A	6,175		
6	9,000	3,000	5,820	180	N/A	N/A		
7	20,608	6400	N/A	<u>14,208</u>	N/A	N/A		
8								
9	25,322	12,480	N/A	<u>12,842</u>	N/A	<u>12,842</u>		
10	57,461	24,761	28,962	1,196	N/A	30,158		
11	34,814	16,800	N/A	N/A	N/A	18,014		
12	37,325	37,325	N/A	N/A	N/A	N/A		
13	26,347	16,172	1,550	N/A	N/A	N/A		
14	17,908	10,300	1,897	425	N/A	2,322		
15	14,473	2,545	1,080	6,325	N/A	N/A		
16	17,460	5,460	N/A	10,980	N/A	N/A		
17	34,161	16,617	N/A	N/A	N/A	N/A		
18	24,500	6,000	3,134	N/A	N/A	N/A		6,500
19	27,809	11,872,	N/A	10,311	N/A	12,559		
20	41,000	8,800	N/A	32,200	N/A	N/A		
21	28,145	11,326	N/A	9,770	N/A	16,819		
22	33,412	13,768	<u>11,148</u>	N/A	N/A	<u>11,148</u>		
23	20,000	5,000	6,000	9,000	N/A	N/A		

¹³ Including shares held by State legal person (SLP) and those held by 'Designated' legal person

Appendix table 2: Share structure of sample high-tech PLCs in the year listed

	Total	A	State-owned	Legal Person	Employer	Creator	B	H
1	8,397	4,165	3,186	N/A	0.02	1,045		
2	8,104	1,200	N/A	N/A	300	5,874		
3	19,867	7,240	N/A	10,128	N/A	N/A		
4	20,302	6,318	8,531	5,416	N/A	N/A		
5	9,375	3,700	6,375	N/A	300	N/A		
6	9,000	3,000	5,820	180	N/A	N/A		
7	12,880	4,000	8,880	N/A	N/A	N/A		
8								
9	22,441	9,600	N/A	12,841	N/A	N/A		
10	11,070	3,780	6,570	300	420	N/A		
11	14,100	5,400	8,100	N/A	600	N/A		
12	15,552	15,552	N/A	N/A	N/A	N/A		
13	4,339	660	431	2,407	840	N/A		
14	11,905	6,094	1,495	4,352	N/A	N/A		
15	6,600	600	541	5,309	150	N/A		
16	14,550	3,650	9,150	850	900	N/A		
17	34,161	16,617	N/A	N/A	N/A	N/A		
18	24,500	6,000	3,134	N/A	N/A	N/A		6,500
19	5,008	1,170	490	3,217	130	N/A		
20	41,000	8,800	30,835	N/A	N/A	N/A		
21	5,500	1,700	280	3,320	200	N/A		
22	8,896	3,000	3,280	2,500	116	N/A		
23	20,000	5,000	6,000	N/A	N/A	N/A		

Appendix table3: The size and rank of university high-tech PLCs in Chinese stock market (2000)

Rank	Company	Turnover	Net Profit	Total Asset	Market Cap
18	Shen Keji	170,819	23,542	340,050	3,004,288
37	Zhongxing	102,705	10,459	260,226	1,787,500
65	Great Wall Computer	62,783	12,009	151,493	869,722
72	Tsinghua Tongfang	253,386	6,202	276,751	385,647
224	Founder	66,104	2,570	94,640	405,907
239	Zheda Wangxin	40,330	4,140	97,246	323,308
290	BeiDa Keji	29,548	8,349	55,860	349,412
339	Nankai Guard	17,484	4,000	64,321	431,297
452	TianDa Tiancai	17,301	2,327	45,887	354,392
465	Fudan Fuhua	12,033	1,690	87,973	293,371
472	Tongji Keji	21,889	470	94,628	258,206
486	Qingniao Tianqiao	14,311	3,582	35,529	315,264
577	Yunda keji	4,892	2,032	59,810	310,482
608	Qingniao Huaguang	6,817	242	72,623	381,058
666	Zheda Haina	5,195	903	40,233	341,360
683	Zhong Kejian	15,201	-1,334	60,418	214,854
692	Zhongguo Gaoke	7,676	307	53,089	253,170
698	Jiaoda Nanyang	6,552	671	42,029	270,163
727	Jiaoda Keji	2,125	-93.75	60,961	305,034
759	Jiguang Guhan	9,433	909	45,561	128,307
791	Zhongke Yinghua	2,738	586	42,061	175,900
874	Beida Gaoke	5,395	94.02	35,945	67,937

A.2 Definitions of Variables

A.2.1 Variables of the model

Definition of High-tech publicly listed companies

Shareholding Corporations refers to economic units registered in accordance with the *Regulation of People's Republic of China on the Management of Registration of Corporate Enterprises*, with total registered capitals divided into equal shares and raised through issuing stocks. Each investor bears limited liability to the corporation depending on the holding of shares, and the corporation bears liability to its debt to the maximum of its total assets. (China Statistic Yearbook, 2000:464). High-tech PLC refers to shareholding corporations that engage mainly in high-tech industrial sector.

Previous researches on the ownership made attempts to define the ownership through the analysis of either voting rights or cash flow rights. Shleifer & Viney (2000) try to identify whether corporations are *widely held* or have *ultimate owners* ¹⁴ by measuring substantial voting rights of larger firms in 27 countries. One of the assumptions of previous researches is that ownership patterns are considered to be relatively stable. This research, however, argues that it is not appropriate to adopt a static model for the study on ownership patterns in a dynamic transitional economy, in which the ownership and property rights by nature are insecure and unstable, by legal terms are far more incomplete than that in the west civil society.

State owned and state holding majority shares enterprises: refer to state-owned enterprises and the enterprises which state holds majority shares. State owned enterprises (industry ownership by the whole people or state-run industry) refers to non-corporation economic units, where the entire assets are owned by the state and which have registered in accordance with *the Regulation of the People's Republic of China on the Management of registration of Corporate Enterprises*, including the state-owned enterprise, sole state-funded corporation and state owned joint ownership enterprise. (Yearbook 2000, p. 464)

Collective owned Enterprises: refers to industrial enterprises where the means of production are owned collectively, including urban and rural enterprises invested by collectives and some enterprises which were formerly owned privately but have been registered in industrial and commercial administration agency as collective units through raising fund from the public. (Yearbook 2000, p. 464)

Appendix table 4 : Ownership structure of shares in Chinese stock markets

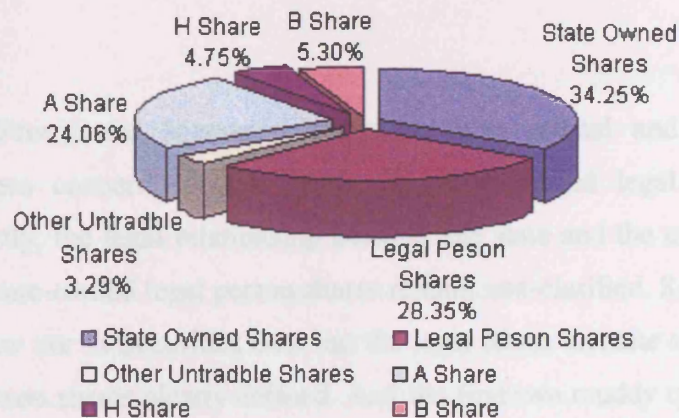
There are four types of shares: state shares, Legal person shares, individual shares, and foreign capital/person shares. The basic rationale under the classification is to control the transferability of different types of shares: State shares and legal person shares are theoretically non-transferrable, foreign shares may only be traded in a special, closed market, and individual shares may be transferred only between Chinese citizens.

State shares	State shares refer to shares held by governmental agencies or authorized institutions on behalf of the state. According to relevant regulations, it shall include: (1) Shares converted from the net assets of SOEs that have been
--------------	--

¹⁴ Five types of ultimate owners: 1) a family or an individual, 2) the State, 3) a widely held financial institution such as a bank or an insurance company, 4) a widely held corporation, or 5) miscellaneous

	transformed into joint stock companies. (2) Shares initially issued by companies and purchased by governmental departments on behalf of the state. (3) Shares initially issued by companies and purchased by the investment companies, assets management companies, and economic entity companies authorized to make investment on behalf of the State. <u>State shares are not allowed to be traded on an open market.</u>
Legal person shares	Legal person shares refer to the part of shares of a listed company owned by another company or institution with a legal person status. The legal person shares can be indirectly hold by the State if the shareholders are state-owned companies. Basically, there are four types of owners for legal person shares, namely, 1). <i>state-owned legal person shares</i> , 2). <i>collective enterprise legal person shares</i> , 3). <i>private enterprise legal person shares</i> , 4). <i>foreign invested enterprise legal person shares</i> , and <i>institutional legal person shares</i> . <u>The transfer and trading of legal person shares are also restricted.</u>
Individual shares or A shares	Individual shares, officially recognized as A shares, refer to shares that may only be owned by Chinese citizens. A shares can be traded and transferred in domestic markets.
Foreign Capital Shares	Foreign capital shares include B shares and shares listed on overseas stock markets. B shares are denominated in RMB, but are traded in U.S. dollars and Hong Kong dollars in Shanghai Stock Exchange and Shenzhen stock exchange respectively. B shares were originally reserved for foreign investors and not open for domestic investors until February 29, 2001.
H shares	Chinese companies listed on Hong Kong Stock Exchange offer H shares.
N shares	N shares are issued to foreign investors on US stock exchanges.
L shares	According to a memorandum of understanding signed between U.K and China's relevant authorities on October 7, 1996, Chinese companies listed on London Stock Exchange offer L shares.

Appendix Figure 1: Capital Structure of Chinese stock market as of 31/12/1999



A.2.2 The legacy of state shares and state-owned legal shares

Shares issued by a typical SOE consist of three types: state shares, legal person shares and individual shares. Individual shares are tradable shares that are owned by individual and institutional investors. State shares and legal person shares constitute the majority of total shares. Corporate employee shares and staff shares account for only a small part of the total issuance

So far, a national law governing shares held by the state has yet to be developed. As an expedient, in 1994, the National Administration of State Assets and the State Economic Restructuring Committee jointly promulgated the Provisional Measures on the Regulation of State-owned Share Rights Issued by Companies Limited by Shares. Taking into account the fledgling status of the Chinese capital market, scant treatment is given by the Provisional Measures to what is a very complicated subject.

Under the Provisional Measures, 'state-owned share rights' include 'state shares' and 'state-owned legal person shares.' The Provisional Measures give state shares and state-owned legal person shares a vague definition: 'state shares' are shares obtained by an institution on behalf of the state in exchange for the capital contribution made by that institution on behalf of the state to a company limited by shares; and 'state-owned legal person shares' are the shares obtained by a state-owned legal person industrial enterprise or state-owned legal person non-industrial entity in exchange for the capital contribution made by that enterprise or entity to a company limited by

shares using the state assets to which the enterprise or entity has a legal right to dispose.¹⁵

However, the Provisional Measures leave the most critical and most debated substantive issues concerning state shares and state-owned legal person shares unresolved. Firstly, the legal relationship between the state and the entities that hold state shares or state-owned legal person shares remain non-clarified. Secondly, neither in Corporate Law nor in Securities Law has the legal terms on state shares and state-owned legal person shares clearly defined. And the first two muddy questions lead to the third problem in terms of the exercise of the legal rights attached to the state shares and state-owned legal person shares.

State shares and state-owned legal person shares are a peculiar product of China's 'socialist shareholding system' evolved from 'dual-track' systems through 1980s. The concept of state-owned legal person shares is peculiar to the evolution of China's public ownership system. State-owned legal person shares originated from SOEs self-raising capital accumulated throughout early reform periods; the contract and responsibility policies allowed the use of market incentives in the form of extra profits versus taxes. SOEs accumulated extra profits that theoretically belong to the state under the political-economic theory of public ownership, but which, in practice, the enterprises creating those profits have a legal right to retain. In a shareholding system, when an enterprise invests in a company by shares, using such 'state-assets which the enterprise has a legal right to dispose', as compared to the pure 'state assets', the enterprise receives 'state-owned legal person shares', rather than 'state shares.'

¹⁵ The Provisional Measures further prescribe four general principles governing the state-owned share rights (pending the promulgation of further specific rules): 1. The predominance of the socialist public ownership system shall be reserved in the shareholding system by maintaining the controlling position of the state-owned share rights pursuant to national industrial policies. 2. The government's dual functions—as market regulator of, and as market participant in, the stock corporations—should be delineated and separated. 3. Methods should be adopted for better deployment and investment of state assets so as to enhance the operating efficiency of state assets; and 4. The principle of same rights and same interests for the same stock should be applied to state-owned share rights so as to protect the interests of state-owned share rights from being eroded.

A.2.3 The legacy of non-tradable shares

In a socialist society, a shareholding system is utilised to conduct large-scale, modern production to preserve public ownership of means of production as the mainstay of the national economy, through distribution of shares in such proportions as to result in the dominance of state ownership.

In 1994, the State Council promulgated the National Industrial Policies for the 1990s, mapping out a macro plan aimed at preserving the predominance of the socialist public ownership system in the national economy. The conversion of enterprises into publicly listed companies should comply with the policies to result in the necessary dominant positions for state shares and the secondary position for state-owned legal person shares, with Chinese public shares to occupy a third, non-controlling, and minority position. Having thus created a hierarchy in the primary market for shares of the state, legal person, and public members respectively, the government designed a peculiar secondary market aimed at maintaining in the secondary market the same hierarchy of classes of shares created in the primary market. As a result, the trading of state shares is banned, the trading of state-owned legal person shares is confined with the scope of state-owned legal persons, and Chinese public members may trade Chinese public shares among themselves.

On the other hand, during the period of shareholding experiments, the largest shareholder was usually the line ministry that was in charge of this enterprise. Under the planned economy, the line ministry and local bureaux took charge of the management of state assets that fell within their jurisdiction to the limits of their authority. The state assets that were controlled by one department were difficult to be transferred to other departments. This system resulted in a departmental system and of management style of state assets. After the emergence of shareholding enterprises, the departmental system was almost broken down mainly due to the existence of cross-shareholdings among enterprises as legal person shares. If the state and legal person shares were allowed to be traded in the secondary market, it would become difficult to control the shares that the authorities owned before. In 1992, the State Economic System Reform Committee proclaimed the regulations concerning companies limited by shares and limited liability companies, which clearly divided the company shares

into three forms: state shares, legal person shares and individual shares. Thus, the departmental system of ownership could be maintained as long as restriction on the trading of state/legal person shares was observed and such assets were not allowed to flow out to other departments or individuals.

The legacy of non-tradable shares results in the contradiction between the need to create a secondary market for state shares and state-owned legal person shares so as to enhance the investment performance of state assets, and the fear of losing the predominant position of state-ownership in the national economy as mandated by the Constitution.

Chapter 9 Conclusion

The reform has transformed every aspect of Chinese society. This thesis has focused on one small facet of this transition - the changes of ownership and property rights in the high-tech industrial sector in general, and in the spin-offs of R&D institutions in particular. The high-tech sector has a specific location in contemporary China, as it is one of the few areas that the state has had and still has a strong presence, with the government intimately associated with its development throughout the reforms. This research examined the institutional change of ownership and property rights of high-tech spin-offs in a historical context recognising that these spin-offs were born out of the plan but have gone beyond it.

In this final chapter, this thesis firstly concludes on the evolution of university high-tech spin-offs with the characteristics of 'fuzzy property rights' and 'public entrepreneurship', and attempts to illustrate the feature of their 'path dependence' within the Chinese high-tech sector. Secondly, this thesis discusses the research findings that address the research questions and serve the research objectives originally identified in the introduction. Finally, it indicates the implications of this PhD research finding for the development of research on property rights in China and summarises the contribution of this research to a theorising of the future transitional path of China.

9.1 The path dependence features and consequences associated with high-tech spin-offs

The research identifies the following characteristics associated with the evolution of high-tech spin-offs in transitional China.

1. The strong presence of the state

- a). China's economic reform occurred at a time when accelerated scientific and technological breakthroughs, particularly in information technology,

marked the beginning of a “New Economy”. Thus, China encountered the challenge of developing a mass-production manufacturing economy in a very short time span (no more than twenty years or so) *while at the same time* engaging in a transformation into a New Economy.

This thesis argues that China’s government took an active approach to the challenge of industrialisation and the fostering of new and high-tech industries to provide breakthroughs in sustaining economic growth.

b). The development of the high-tech sectors owed much to the reforms, but also drew heavily upon the collectively ‘accumulated capacity’ of science and technology built up in the previous era of planning, particularly in the first stage of reform. For much of the reform period that followed the Mao era, the norms and methods of the past prevailed in governance and administration, serving as the principal instruments by which successive reforms incorporated market principles into the extant system.

The springboard for growth of the high-tech sectors in China in the early reform period were the science and technology and R&D capabilities that had accumulated under Mao in which the unique ‘government-industry-university (R&D institution)’ partnership was originally forged. China’s prior institutional framework allowed government and the universities (R&D institutions) to engage in activities that went far beyond basic research and which were the early driving forces for product development and commercial adventures, creating an ‘industrial-academic-research’ (*chan-xue-yan*) framework with Chinese characteristics.

c). Central government policies played a vital role in creating an appropriate environment to foster the transformation of S&T research outcomes into commercial ventures.

The government led the reform in the S&T sector through the policymaking and management of two major government projects: the National High

Technology Research and Development Programme of China (863) and the Torch Programme.

The state S&T programmes initially relied upon extant institutions, including the ‘*tiao*’ and ‘*kuai*’ system established under Mao. Based upon the extant governance system, through institutional innovation, the government instituted a network of High Technology Development Zones (HTDZ) to facilitate the state plan and support the commercialisation of R&D.

2. Fuzzy property rights - a stepping stone

a). This thesis argues that in analysing how property rights and ownership evolved in the context of China in transition, an immediate obstacle is to clearly understand how the term “private”, “state”, “public” and “collective” are used in the country. Both government authorities and most firms developed since 1978 onwards encountered confusions and difficulties in the classifying regulations and licensing of enterprises by ownership. The non-legal terms “non-state” and “non-private” often denote a much larger category than legally defined “state” and “private” enterprises.

Under such context, this thesis introduce the concept of ‘fuzzy property rights’, where ownership (the right to possess) cannot be clearly identified given the disarray of the main aspects of property rights: the exclusive right of control over the property, the right to use, the right to income, the right to dispose and the right of transmissibility.

b). While markets are embedded within society, the market value placed on technology or products had to be *created* in the context of China in transition. Property rights, as the set of economic and social relations, defines the position of each individual with respect to the utilization of scarce resources. Therefore, there was a need to manage ‘socio-political equity’ to make the institution of property rights over technology function and to realise their potential market value. Within such a context,

c). 'The right to use' (*de facto* control) was more attractive than 'ultimate ownership' (*de jure* control, or, the right of possess) in the spin-off NTEs at the start-up stage. The pragmatic implication of the 'ambiguity' of property rights, acting as a stepping stone, facilitated high-tech businesses in coping with uncertainties in the process of institutional change.

As indicated in the analysis of the development path of spin-off NTEs, property rights were used as a 'balancing force' and 'strategic tool' to cope with resource constraints and to gain greater individual returns. Fuzzy property rights to some extent were a resourceful strategic choice for enterprises in exchange for substantial opportunities in the 'churn' of transition.

d). The case study evidence indicates that most high-tech enterprises initiated in the first stage of reform were set up with assistance from the state sector and public institutions. The risks and responsibilities associated with commercial adventures were taken collectively. Paradoxically, according to fieldwork evidence, it was just such muddy property rights arrangements that encouraged the initial entrepreneurial spirit in the high-tech spin-offs.

The case study evidence illustrates that while from the standpoint of the business entrepreneur, fuzzy property rights arrangements were a strategic choice; from the standpoint of government, one of many pragmatic implications of fuzzy property rights was their creation of relatively flexible entry and exit points for bureaucratic involvement in the business.

e). Fuzzy property rights were created from the *status quo* defined as the extant constraints and incentives of transitional China. In the process of the 'creation' of appropriate (not necessarily clarified) property rights arrangements and ownership structures for the high-tech spin-offs, the entrepreneurs' vision, motives and social networks or social capital associated with their position within the extant system made the difference.

f). This thesis points out that state ownership and collective property rights over science and technology were rigidly defined and rights were effectively enforced under the party/state governance structure before the reform. However, it was impossible to realise the potential market value of science and technology within such a framework. Once the ideological constraints were relaxed, the reform of the S&T sector involved the *de-clarification* of state ownership and the gradual reassignment of specific property rights in order to make the institution of property rights over technology function in the ‘dual-track’ market.

The de-clarification of state ownership in the S&T sector led to diversification and fuzzy property rights over technology and products in high-tech enterprises were the outcome of such a change. The diversification of the S&T sector was associated with *deregulation*. Instead of fundamental changes to the governing structure, mechanisms to specify and enforce property rights gradually evolved from the extant system through the decentralisation and incorporation of market-oriented institutions.

This thesis emphasises that it was not the ownership and property rights *per se* that mattered to the efficiency of enterprises, but the functional ownership and property rights that could be realised through the management of socio political equity under the precise contextual circumstances of China in transition.

3. Public entrepreneurship – another stepping stone

This thesis borrow Olson’s concept of ‘public entrepreneurship’ to describe the nature of university spin-offs. The use of the concept of ‘public entrepreneurship’ in this research is interpreted as individual entrepreneur behaviour leading towards socially beneficial decision involving creating

business organisations for the collective good rather than for mere individual benefits.

a). The fieldwork evidence indicates that entrepreneurship existed in the semi-planned and semi-market system in the form of *public entrepreneurship*. This thesis argues that while the spirit of entrepreneurship was vital in the start-up of high-tech businesses, the strength of this spirit would not have been released had it not fitted in to the institutional context in which it was applied.

b). This thesis identifies the characteristic of *individualism growing out of the collective legacy* in the development of high-tech spin-offs as the key stepping stone of 'public entrepreneurship'. *Public entrepreneurship* as a unique set of institutional arrangements, allowed individuals to take different and even contradictory actions and thus helped them cope with the *ideological uncertainty* of the transition.

c). The essence of *public entrepreneurship* is the ability to manage 'socio-political equity' to make the institution of property rights over technology function and to realise its potential market value, no matter how fuzzy property rights are.

4. Consequence of 'path dependence' – the potential costs of further change

a). The case study evidence shows that after initially fast development as non-state enterprises, university PLCs re-emerged with similar features to state owned listed companies after shareholding restructuring in terms of behaviour, performance and governance structure. As a result, the unexpected convergence between unconventional high-tech enterprises and traditional SOEs in terms of ownership structure and property rights arrangements occurred.

The case study evidence indicates that the largest shareholders of these high-tech PLCs became the universities and R&D institutions from which they

were originally created. Instead of clarifying rights and liabilities, shareholding restructuring carried forward the legacy of fuzzy property rights characteristic of the start-up stage. It simply continued and institutionalised the *status quo* once public listing had been achieved.

b). As fuzzy property rights and public entrepreneurship have acted as stepping stones for the growth of high-tech spin-offs, the interests of the state, of the collective *and* of the private sectors have been institutionalised through shareholding restructuring. The institution of property rights within high-tech PLCs is characterised by a dynamic mixed ownership of Chinese shareholding enterprises. The case studies identify the following changes associated with high-tech PLCs:

(1). The state has retreated in terms of the nature and the scale of state-owned shares in high-tech PLCs. Although the state remains the largest shareholder in the majority, the findings indicate that state shares in the form of more vaguely defined legal person shares has increased significantly.

(2). A large number of these PLCs currently have left the question of 'state-owned shares' undefined. This implies the possibility of changing the nature of 'state-owned shares' subject to changes in macro-institutional arrangements and the political judgement of decision-makers.

(3). Compared with the significant decrease in the absolute amounts of state-owned shares, the increase in the scale of creator shares indicates clearly the growing extent of albeit covert privatisation.

c). Shareholder oriented corporate governance has been introduced in the institutionalisation of fuzzy property rights. The state agents of university PLCs created networked corporate control through which the hidden privatisation of the enterprises occurred. The group interest of state agents, coined as 'networking executives' in this thesis, conflicts with the interests of

the state as the ultimate owner and of the large group of nominal owners of the enterprises. As a result, future reform aimed at further retreat of the state from the high-tech shareholding companies inevitably entails significant political and economic costs associated with uncertainty in the *redistribution* of property rights.

9.2 Challenge to the neo-classical property rights perspective

The evidence of this research suggests that the appropriate structure of property rights is a *dependent variable* in the model described in Chapter 6 of this thesis, as opposed to an explanatory variable as suggested by the neo-classical property-rights school (Demsetz, 1967). Instead of neo-classical property rights model expressed as:

$$f(\text{economic development}) = g(\text{property rights})$$

results of this thesis reveal a new model that is appropriate within Chinese context which can be expressed as follows:

$$f(\text{property rights}) = g(\text{economic development})$$

This new model provides theoretical framework to challenge the *Washington Consensus*, which has dominated the reform policy in transitional economies since early 1990s onwards. This new framework endorses Stiglitz's (2003) insight on institutional change of property right and highlights the danger associated with property myth, which has misled many of the countries engaged in transition to focus merely on property rights issues, on privatisation, rather than a broader set of issues. As indicated in the new model, resolving property rights is certainly not sufficient and may not even be necessary for sustainable development of transitional economies.

9.2.1 Revisiting research question 1

RQ1: How and under what circumstances did non-privatising reform work in China?

The evidence of this research demonstrates that, above all, it is the extraordinary flexibility, pragmatism, ingenuity and resistance to orthodoxy embedded in China's reform that has facilitated non-privatising transition. China's reform has involved pragmatic attempts at wealth creation, welfare improvement and growing efficiency by the most appropriate available means within its extant contextual circumstances. Hence, privatisation was not taken as the ultimate purpose of the reform, instead, various forms of private ownership and private property rights have turned out to be partial *outcomes* of reform.

Meanwhile, the lack of any sort of consensus on reform strategy and the trial-by-error experimental attitude considered by many scholars to be a potential weakness of China's transitional path actually created a *dynamic framework* involving many fewer transaction costs of institutional change than the pre-cooked textbook path would have done.

The borrowing of market-oriented mechanisms and other countries' reform experience in a pragmatic fashion has been a distinctive characteristic of China's transition. Regarding the fundamental conflict between other countries' long-established market-oriented institutional structures and the institutional matrix of transitional China, it has been a process of compromise and integration, rather than mere transplantation, of market oriented institutions into China's endogenous economic development.

9.2.2 Revisiting research question 2

RQ2: Could China's economic reform coupled with privatisation lead to even more successful economic performance?

This research argues that the maintenance of the state sector, especially at the early stage of China's reform, not only postponed the difficult tasks and unstable outcomes of radical ownership reform, but also presented an opportunity for ownership change with government accepting a *fait accompli*. The case study evidence suggests that in the muddy transitional process, the SOEs to some extent served as the connecting link between the collective plan and the individually oriented market player. **The latter grew from the ashes of the former.**

The state has not only subsidised the development and growth of high-tech enterprises but more importantly nurtured the establishment of market institutions throughout the transition. In November 2003, the State Education Committee issued a watershed policy to disconnect the newly founded high-tech spin-offs from the university. According to the policy, the newly founded spin-offs are now no longer allowed to use the university name, as 'invisible assets', thus losing a key but preventing new problems associated with fuzzy property rights in the future. This new regulation, aimed at clarifying property rights of high-tech spin-offs from the start-up stage, fits into the current contextual circumstance of China in the sense that the new spin-offs can easily obtain resources from functioning factor markets and operate in a business environment in which the primary market institutions have been well established. However, could the application of this policy in the 1980s have led to an even greater performance of high-tech spin-offs? *This thesis suggests otherwise.*

The current situation shapes the institutions of tomorrow and, as a result, institutional change cannot be explained in abstract from past institutional frameworks. Thus, with regard to China, the institutional arrangements of the Mao era (1949-76), with its features of rigid party/state governance structures and the political norm of the collective good, shaped both the evolution of the new institutional framework and the nature of the market in China-in-transition.

China's transition from planning to the market which started with the incorporation of competition and market principles into the system and which gradually progressed by building up market-oriented institutional infrastructures. It was a 'reconstitutive downward' process that shaped the path of reform in China. And fortunately, this process was not interrupted by exogenous forces, particularly in the early stage of the reform. This was due partly to China's isolation from the world and consequently to its 'immunity' to the Washington Consensus in the late 1980s and early 1990s, and partly to the solid existence of a functioning governance mechanism. This thesis concludes that given the contextual circumstances of transitional China, it was a blessing that China's economic reform was not coupled with outright privatisation from the beginning.

9.2.3 Revisiting research question 3

RQ3: what did the received wisdom of the private property rights perspective offer and to what extent it is applicable in the Chinese transitional context?

This research argues that it is highly questionable to suggest that the reason why one type of enterprise works while another does not is associated with the clarity (or otherwise) of property rights. Unclear property rights are, to some extent, constant, whether or not firms are successful, whether Chinese or western, public or private. A textbook based application of neo-classical private property rights perspective with privatisation as the ultimate goal was simply not relevant in the context of China in transition.

Moreover, this research argues, the efficiency perspective associated with the neo-classical property rights school, if not irrelevant to the practical experience of both individual and public-owned enterprises' transformation of property rights and ownership, was certainly hijacked by vested interest groups to justify covert *de facto* privatisation within an ideological framework which nominally favoured public ownership, leading to a massive transfer of industrial property from the collective to individuals.

9.3 The contribution to future research

9.3.1 The contribution to research methods

Instead of following the somewhat tired dichotomy of ‘the free market versus government intervention’ and the deterministic approach of the neo-classical property rights school to interpret the transition of new high-technology industries in China, this thesis has adopted an institutional approach to change involving an analysis of “the non-teleological, creative, and non-determined nature of the evolutionary process”. This thesis takes an institutional approach which involves interpreting the evolution of the high-tech sector as a process through which both ‘economic rationality’ and ‘institutional (political) norms’ at the macro level, and ‘strategic and operational needs’ and the ‘desire to retain political control and placement’ at the micro level are intertwined forces that dynamically shape the path of institutional change.

Given the fact that ownership structure has never been static but rather dynamic in the transitional process, the findings of this thesis raise doubt on research of the assessment of the potentially superior productivity of firms under one certain ownership over another. While many studies of changes of ownership and property rights in transitional economies have focused on productivity, efficiency and growth rates associated with different type of enterprises, this thesis has concentrated instead on institutional changes in the nature of these enterprises. The explanatory institutional approach to property rights is preferred in this thesis instead of predictive neo-classical approach. Changes entailing individual economic actors’ experience of uncertainty are often invisible when measured with standard economic indicators. The bird’s eye view of individual actors’ reactions to institutional changes gained from qualitative research is therefore justified.

The case study evidence of this thesis suggests that in its attempts to reform socialism, China has been moving down an unknown path. The unknown path has unfolded and been shaped by the dynamic interactions between the institutional matrix and the

economic actors embedded within it. This thesis strongly argues that in the light of China's experience, the creative process involves the following key elements:

- Individual initiatives at the grass-roots level have been the key forces that have triggered macro level change. However, individual initiatives are merely reflections of the institutional environs and of the constraints and incentives embedded in them.
- Grass-roots reform has led to broad-based institutional changes constructed at the state level in the form of laws and policies which thereafter became new institutional constraints on individual initiatives.
- Individual economic actors adapted to these new rules and subsequently modified the socio-economic environments, in which they lived and operated.

Given the lack of historical precedents, individual reform measures often have unknown consequences. Therefore, the seesaw attitude and the reluctance of the Chinese government to experiment with any one particular measure has been the strength of China's transition so far, a transition through which specific reforms have been attempted on a small scale and, where successful, have been gradually disseminated nation-wide. Such a strategy has allowed time lags for individual economic actors to choose to adopt, resist or simply ignore the broad-based institutional changes which have impacted upon the nature and path of the reform process.

9.3.2 Implications for the development of research on property rights in China

With regard to the research question, is the application of further privatisation and other 'liberal' instruments appropriate to solve the problems that challenge China today? This research argues that as a result of incremental reform, the presence of the private sector in the Chinese economy is getting stronger and that privatisation has passed the point of no return. The strength of the expanding private sector and the associated socio-political interest groups have greater power and influence over the choice, scale and pace of further reform. The future stable development of China is a

variable dependent upon the extent to which institutional changes are able to reduce the risks associated with subjection of Chinese economy solely to privatisation policy.

Currently, there is ongoing strong lobby from both business and academic communities to raise the status of private business. It is argued that to unleash their full growth potential, private firms continue to need more accommodating policies. Government efforts to improve policies, law, regulations, and rules affecting private enterprise are the core of the lobby. Governments on all levels, as the lobby group suggested, should direct immediate priority to easing the constraints imposed by (i) access to finance, (ii) availability of managerial and technical skills, (iii) availability of information, (iv) non-transparent and/or inconsistent implementation of policies and regulations, and (v) inappropriate competition policies and other deficiencies in the organisation of markets.

This thesis identifies that private enterprises are becoming an ever more important source of PRC growth and employment; however, they developed alongside the public sector. As specified in the case of high-tech spin-offs in this thesis, the non-state spin-offs' rapid emergence throughout the country indicates comparatively free entry into markets and strong government intervention and subsidies to their development. The unclarified ownership and fuzzy property rights associated with the development of spin-offs indicates that the property rights and ownership arrangements of the enterprise may be necessary but definitely not sufficient to the growth of high-tech spin-offs.

This research identifies that fuzzy property right has been a stepping stone in the development of high-tech spin-offs in the past two decades. One of the major concerns is whether the *status quo* of property rights and ownership arrangement within high-tech publicly listed companies, described in Chapter 8, which has been established alongside fuzzy property rights, would hold back the dynamos of their further growth and sustainable development. This concern leads future research towards the question of whether privatisation or other forms of reform policy prioritising property rights and ownership change should be favoured in the further development of high-tech enterprises. Equally important, future empirical research with regard to the further evolution of property rights and ownership of high-tech

enterprises should follow up the alteration of fuzzy property rights in the changing institutional matrix of transitional China. The results of this thesis suggest the following key future research questions:

- Under what circumstances will fuzzy property rights and the *status quo* of corporate governance structure associated with it remain at helm within high-tech enterprises?
- To what extent would it be necessary that fuzzy property rights be clarified? If so,
- Would privatisation be the best method to employ? If not,
- Instead of focusing on privatisation, should high-tech enterprises who think about sustainable development direct their corporate strategy on the establishment of well-known brand names, the development of independent intellectual property rights and clearly-defined and strong core business?
- At policy level, should government commit to special encouragement of the development of private businesses as the mainstream economists recommend? Or, Should government concentrate on creating a real commitment to “level the playing field” for all enterprises, regardless of size, origin, ownership class and their ideological labels?

As identified in Chapter 8, based on the development of market institutions in the past decade, China’s gradual economic reform in this decade involves further substantial restructuring of the large-scale publicly listed state-owned shareholding corporations. This restructuring inevitably involves elements of privatisation. Given the ‘fuzzy’ nature of the high-tech publicly listed companies in terms of ownership structure, they are, by their very nature, accountable to different principals whose interests are aligned neither in the short nor long run. This raises the concern on the accountability of privatisation policy, which future research should observe and evaluate.

The efficiency and fairness of reassignment of ownership associated with it is partly dependent upon the institutional forces that shape the redistribution of resources and the allocation of power embedded in the process. As a major facet of such institutional forces, changes in corporate governance structures are crucial in the sense that they have multiple effects on stakeholders at the level of the firm while having macro-economic implications at the same time. Thus, this thesis suggests future research to explore the appropriate corporate governance system that would endorse further reform on property rights and ownership within high-tech publicly listed companies.

The picture I have sketched in this thesis also suggests the following. Firstly, transition in China will continue to be a path-dependent process in which individual economic actors' experiences of the reforms are highly contingent on the institutional structure of the state and individual actors' positions in the institutional hierarchy. It will also be shaped by the networks of individual actors and the model of economic action and the organisational structure to which they are exposed.

Secondly, new organisational models and market institutions will continue to be created and unfold on the foundations of the institutions that preceded them. Research with regard to the change of property rights and ownership in transitional China in the next decade should observe and evaluate whether the ownership structure and property rights arrangements of Chinese enterprises will continue to converge towards mainstream models, or, will nevertheless remain distinctly Chinese, or, a bit of both.

Bibliography

- Abell, D. (1978), "Strategic windows", *Journal of Marketing*, July, pp21-6
- Abell, D., Crouchley, R. and Mills, C. (2001), "Social Capital and Entrepreneurship in Great Britain." *Enterprise and Innovation Management Studies*, Vol 2, No.2, pp.119-144
- Alchian, A. and Demsetz, H. (1973), "The Property Rights Paradigm", *Journal of Economic History*, 13, pp.16-27
- Alstete, J.W. (2002), "On becoming an entrepreneur: an evolving typology." *International Journal of Entrepreneurial Behaviour & Research*, Vol.8, No. 4, pp.222-234
- Allen, F. and Douglas, G. (1999), "Corporate Governance and Competition", working paper, Wharton School: The University of Pennsylvania, Philadelphia.
- Ap John, (2001): Understanding the Asian Respondent when Conducting Tourism Research: Some Challenges, Pitfalls and Tips. (UCN internal seminar paper)
- Bai, Chong-en, David D. Li, and Yijiang, Wang, (1997), "Enterprise Productivity and Efficiency: When is Up Really Down?" *Journal of Comparative Economics*, 24, pp.265-280
- Bacani, Cesar & Heieh, David (1999), *Long March to Sanity*, Visions of China, Sep.24, vol.25, p.38
- Baark, E. (1994), "China's New High-Technology Development Zones: The Politic of Commercialising Technology, 1982-1992," *Washington Journal of Modern China* 2,1 pp.83-102
- Barzel. Y. (1989): *Economic Analysis of Property Rights*. Cambridge University Press, p.2
- Baum, Richard & Dreyer, June Teufel (2000), *Political implications of China's economic reforms*, Sept.22
- Bechhofer. F. (1974): 'Current approaches to empirical research: some central ideas', in J.Rex (ed.) *Approaches to Sociology: An introduction to major trends in British Sociology*, London: Routledge & Kegan Paul
- Berg, Andrew, Eduardo Borensztein, Ratna Sahay, Jeromin Zettelmeyer, (1999), "The Evolution of Output in Transition Economies: Explaining the Differences," working paper, WP/99/73 Washington, D.C.: International Monetary Fund.
- Berglof, Eric and Gerard Roland, (1998), "Soft Budget Constraints and Banking in Transition Economies," *Journal of Comparative Economics*, 26, pp.18-40

Bishop, Matthew R. and John A. Kay (1988), *Does Privatisation Work? – Lessons from the UK*. London: London Business School

Bishop, Matthew R. and John A. Kay (1989), “Privatisation in the United Kingdom: Lessons From Experience,” *World Development*, 17, pp.643-657

Blaug, M (1994), *The methodology of economics (Or how economists explain)*, 2nd edition, Cambridge University Press

Bortolotti, Bernardo, Marcella Fantini, and Domenico Siniscalco, (1999a), “Privatisation: Politics, Institutions, and Financial Markets,” working paper, Fondazione ENI-Enrico Mattei (FEEM): Milan

Boycko, Maxim, Andrei Shleifer, and Robert W.Vishny (1994), “Voucher Privatisation,” *Journal of Financial Economics*, 35, pp.249-266

Boycko, Maxim, Andrei Shleifer, and Robert W.Vishny (1996a), “A Theory of Privatisation,” *Economics Journal*, 106, pp. 309-319

Boycko, Maxim, Andrei Shleifer, and Robert W.Vishny (1996b), “Second-Best Economic Policy for a Divided Government,” *European Economic Review*, 40, pp.767-774

Braithwaite, R.B., (1960), *Scientific Explanation*. New York: Harper Torchbooks.

Braithwaite, R.B.,(1964), *Scientific Explanation: a study of the Function of Theory, Probability and Law in Science : based upon the Tanner Lectures 1946* Cambridge: University Press, 1964), Chapter 6

Broadman, H.G. (1995), “Meeting the challenge of enterprise reform”, *World Bank Discussion Paper* No.283. World Bank: Washington, DC.

Broadman, H.G. (1996), “Policy options for reform of Chinese state-owned enterprises”, *World Bank Discussion Paper* No. 335. World Bank: Washington, DC.

Broadman, H. (2001), “Lesson from Corporatization and Corporate Governance Reform in Russia and China.” Paper presented at the international conference on Corporate Governance Development in Vietnam, October 11-12, Hanoi.

Bromley, D. W. (1989), *Economic Interests and Institutions: The Conceptual foundations of Public Policy*. Oxford: Basil Blackwell.

Bromley, D. W. (1991), *Environment and Economy – Property Rights & Public Policy*. Blackwell Publisher.

Buchanan, J.M. (1972), “Politics, property, and the law: an alternative explanation of Miller et al. V. Schoene”, *Journal of Law and Economics*, 15.

Buchanan, J.M., and Vanberg, V. (1991), "The Market as a Creative Process." *Economics and Philosophy* 7: pp167-168

Bush, V. (1945), "Pure Research", *Science- the Endless Frontier*, p.28.

Byrd, W.A. (1992), *Chinese Industrial Firms under Reform*. New York: Oxford University Press.

Byrd, W.A. and Lin, Qingsong (1990), *China's rural industry: Structure, development, and reform*. New York: Oxford University Press

Cao, Yuanzheng, Yingyi Qian, and Barry, R. Weingast, (1999), "From Federalism to Privatisation, Chinese Style," *Economic Transition*, 7:1, pp.103-131

Caves, Douglas, and Laurits Christensen (1980), "The Relative Efficiency of Public and Private Firms in a Competitive Environment: The case of Canadian Railroads," *Journal of Political Economy*, October, pp958-976

Chen Qingtai (2000), *Yangcheng Wanbao* (Yangcheng Evening News) Jan.24

Cheung, S.N.S. (1982), "An Economic Theory of Institutional Change," In: *Will China go 'Capitalists'?* Hobart paper no. 94. pp.30-47, London: Institute of Economic Affairs.

Cheung, S.N.S. (1983), "The Contractual Nature of the Firm", *The Journal of Law and Economics*, 26 (April), pp.386-405

Claessens, Stijn, Simeon Djankov, and Gerhard Pohl, (1997), "Ownership and Corporate Governance: Evidence from the Czech Republic", World Bank Policy Research Paper No. 1737, Washington D.C.: World Bank.

Claessens, Stijn and Simeon Djankov, (1999a), "Enterprise Performance and Management Turnover in the Czech Republic," *European Economic Review*, 43, pp.1115-1124

Claessens, Stijn and Simeon Djankov, (1999b), "Ownership Concentration and Corporate Performance in the Czech Republic", *Journal of Comparative Economics*, 27, pp.498-513

Coase, R.H. (1937), *The Nature of the Firm*, *Economica* (n.s.) 4, pp386. Also in American Economic Association, *Readings in Price Theory*, selected by a Committee of the American Economic Association (1952), and elsewhere.

Coase, R.H. (1960), "The problem of social cost", *Journal of Law and Economics*, 1, pp. 1-44

Coase, R.H. (1988) *The Firm, The Market, and The Law*. University of Chicago Press

Commons, J.R. (1961), *Institutional Economics*, Madison, WI: University of Wisconsin Press.

Cooter R.D. (1984), "Were the ordinalists wrong about welfare economics?" *Journal of Economic Literature*, 22

Cooter R.D. (1987), "Coase Theorem", in *The New Palgrave: A Dictionary of Economics*. (Ed.) John Eatwell, Murray Milgate and Peter Newman, Macmillan: (1): 457-59

Cornelius, K, P (2002), "Executive Summary", *Global Competitiveness Report*, Oxford: Oxford University Press

Cornelius, K. P. Balnke, J. and Paula, F (2002), "The Growth Competitiveness Index: Recent Economic Developments and the Prospects for a Sustained Recovery", Chapter 1.1, *Global Competitiveness Report*, Oxford: Oxford University Press

Csaba, L. (2002), "Transition and Development", *Tiger Working Paper Series* No.33, Warsaw

Dahlman, Carl J (1980), "The Problem of Externality" In: *Journal of Law and Economics* 22: pp.141-162, April 1979, reprinted in *Development Review* 6(1):1-30, March 1980, p.15.

De Marchi, N., and Blaug, M (1991), *Appraising Economic Theories*. Hants: Edward Elgar

Demsetz, H. (1967), "Toward a theory of property rights", *American Economic Review*, 57, 347-59

Demsetz, H. (1988), *Ownership, Control, and the Firm: The Organisation of Economic Activity*. Oxford: Blackwell, 104-106

Demsetz, H. (1989), *Efficiency, Competition, and Policy: The Organisation of Economic Activity*, vol. II. Oxford: Blackwell.

Dernberger, B.F. (1999), *The PRC at 50: The Economy*, *The China Quarterly*, Sep. Vol. 159, p610

Djankov, S. (1999a), "Ownership Structure and Enterprise Restructuring in Six Newly Independent States," *Comparative Economic Studies*, 41:1, pp75-95

Djankov, S. (1999b), "The Restructuring of Insider-dominated Firms: A Comparative Analysis," *Economic Transition*, 7:2, pp.467-479

Djankov, S. and Murrell, P, (2000), "The Determinants of Enterprise Restructuring in Transition: An Assessment of the Evidence," working paper University of Maryland, College Park, MD

Dosi, G., and Malerba, F. (1996), "Organisational Learning and Institutional Embeddedness." In: *Organisation and Strategy in the Evolution of the Enterprise*, pp. 1-24. London: Macmillan.

Dutta, S and Jain. A (2003), "The Networked Readiness of Nations", Chapter 1, *The Global Information Technology Report*, pp4-26. New York & Oxford: Oxford University Press

Dyck, I.J. Alexander (1997), "Privatisation in Eastern Germany: Management Selection and Economic Transition," *American Economic Review*, 87, pp.565-597

Dyer Jr, W.G., (1994), "Toward a theory of entrepreneurial careers", *Entrepreneurship Theory and Practice*, Winter, pp.7-21

Earle, J. (1998), "Post-privatisation Ownership and Productivity in Russian Industrial Enterprises," SITE working paper 127, Stockholm School of Economics, Stockholm

Earle, J. and Estrin, S. (1998), "Privatisation, Competition and Budget Constraints: Disciplining Enterprises in Russia," SITE working paper 128, Stockholm School of Economics, Stockholm

Edwards, S. (1998), *Forging Reform in China: The Fate of State-owned Industry*. Cambridge University Press.

Eichner, A.S. (1983), *Why Economics Is Not yet a Science*. Basingstoke: Macmillan

Elster, J (1989), *Nuts and Bolts for the Social Science*. New York, Cambridge University Press

Fan, Gang (1994), "Incremental changes and dual-track transition: understanding the case of China", *Economic Policy December*, United Kingdom

Fan, Gang (2002), "Institutional Reforms in a Developing Country: Transition in China", Tiger Working Paper Series No.29, Warsaw

Fewsmith, Joseph (1998), '*Jiang Zemin takes command*,' *Current history*, vol97, No.620, p.252

Fllickson, R. (1986), "Of Coase and Cattle: Dispute Resolution Among Neighbors in Shasta County." *Stanford Law Review*, 38: pp 624-87

Fllickson, R. (1994), *Order without Law*. Cambridge, Mass: Harvard University Press

Fisher, S & Gelb, A., (1991), "The process of socialist economic transformation," *Journal of Economic Perspectives*, 5,4, pp.91-105

Frydman, Roman, Cheryl W.Gray, Marek Hessel, and Andrzej Rapaczynski, (1999), "When Does Privatization Work? The Impact of Private Ownership on Corporate Performance in Transition Economies," *Q. Journal of Economics*, 114:4, pp.1153-1191

Frydman, Roman, Cheryl W.Gray, Marek Hessel, and Andrzej Rapaczynski, (2000), "The Limits of Discipline: Ownership and Hard Budget Constraints in the Transition

Economies,” C.V. Starr Center for Applied Economics working paper, NYU, New York.

Francis C. (1999), “Bargained Property Rights: The Case of China’s High-Technology Sector.” In: Oi. Jean and Walder. A (Ed), *Property Rights of Economic Reform in China*, pp226-247, Stanford, California: Stanford University Press.

Frydman, Roman, Katharina Pistor, and Andrzej Rapazynski, (1996), “Exit and Voice After Mass Privatization: The Case of Russia,” *European Economic Review*, 40, pp. 581-588

Furubotn, E and Pejovich.S (1972), “Property rights and economic theory: a survey of recent literature”, *Journal of Economic Literature*, 10, pp1137-62

Garnsey, E. and Alford, H. (1996), “Innovative interaction: supplier relations among new technology-based firms.” In Oakey, R. (ed.), *High Technology Firms* (London: Paul Chapman) pp130-140

Garnesey, E. and Lawton-Smith, H. (1999), *Proximity and complexity in the emergence of high technology industry: the Oxbridge comparison*, *Geoforum* 29: 433-450

Grossman, S.J. & Hart, O.D. (1986), “The costs and benefits of ownership: a theory of vertical and lateral integration”, *Journal of Political Economy* 94: 4, pp691-719

Gu, Shulin. (1994), *Spin-off Enterprises in China: Channelling the Components of R&D Institutions into Innovative Business*, UNU/INTECH Working Paper No.16, Maastricht, Neth: United Nations

Haavelmo, T. (1940), “The problem of testing economic theories by means of passive observations. Cowles Commission for Research in Economics”, *Report of Sixth Annual Research Conference on Economics and Statistics* (July 1-26): pp. 58-60. In, Malinvaud (1984), *Econometric Methodology at the Cowles Commission: Rise and Maturity*

Hallowell, A.V. (1943), “The nature and function of property as a social institution”, *Journal of Legal and Political Sociology*, 1, pp115-38

Hansmann, H. and Reinier Kraakman (2000), “The end of history for corporate law,” working paper, NYU and Harvard Law School, Cambridge, MA.

Hartford, Kathlee (1991-92), “*Reform or Retrofitting? The Chinese Economy Since Tiananmen*,” *World Policy Journal* 9, No.1 (Winter 1991-92): 46

Hart Oliver, Andrei Schleifer and Robert W. Vishny (1997), “The Proper Scope of Government: Theory and an Application to Prisons,” *Quarterly Journal of Economics*, Vol 112 (4), pp. 1127-1161

Harvey, M. and Evans, R. (1995), “Strategic windows in the entrepreneurial process”, *Journal of Business Venturing*, Vol. 10, pp. 331-47

Hausman, D.M. (1989), Economic methodology in a nutshell. *Journal of Economic Perspectives*, 3(2), pp.115-127

Hausman, D. M. (1994) (eds.) *The Philosophy of Economics*, Cambridge: Cambridge University Press

Havrylyshy, Oleh and Donald McGettigan, (2000), "Privatisation in Transition Countries," *Post Soviet Affairs*, 16, pp.257-286

Hayek, Friedrich von. (1994), *The Road to Serfdom*, Chicago, IL.: University of Chicago Press

Hayek, F.A. (1967): *Studies in Philosophy, Politics and Economics*. London: Routledge & Kegan Paul

He Qinlian (1998), *xiandaihua de xianjin (The Catch of Materialisation)*, China Today Press.

Hempel, C. G ., and Oppenheim. P (1948), *Studies in the logic of explanation. Philosophy of Science*, 1965, reprinted in Hempel, *Aspects of Scientific Explanation*, New York: Free Press, pp.245-295

Henwood, K. and Pidgeon, N. (1993): 'Qualitative Research and Psychology,' in *Social Research, Philosophy, Politics and Practice*, (ed.) M.Hammersley, London and New Delhi: Sage

Hodgson, G.M. (2002) "The Evolution of Institutions: An Agenda for Future Theoretical Research", *Constitutional Political Economy*, 13, p111-127, The Netherlands: Kluwer Academic Publisher

Hodgson, G.M., and Knudsen, T. (2001) "The Complex Evolution of a Simple Traffic Convention: The Functions and Implications of Habit." University of Hertfordshire, unpublished mimeo

Hoyningen-Huene, P. (1993): *Reconstructing Scientific Revolutions: Thomas S.Kuhn's Philosophy of Science*.

Hu Xiaobo (2001), "How China Privatises: A New Institutional Perspective" July 31, 2001 / Asia Program Seminar, The Wilson Centre

Huang Yasheng, (2001) "*Internal and External Reforms: Experiences and Lessons from China*," 16 June 2000 <http://www.chinaonline.com>

This article is based on his book, *Selling China: The Institutional Foundations of Foreign Direct Investment during the Reform Era* New York: Cambridge University Press, 2002

Jefferson, G.H., and Rawski, T.G., (1994a), "How industrial reform worked in China: the role of innovation, competition, and property rights".

Jefferson, G.H., (1994b), Enterprise reform in Chinese industry, *Journal of Economic Perspectives* 8(2): pp.47-70

Jefferson, G.H., (1998), China's state enterprises: public goods, externalities, and Coase. *American Economic Review*, 88,2.

Jefferson, G.H., (2000), China's emerging market for property rights: theoretical and empirical perspectives. Working paper No.76, William Davidson Institute

Jenkinson, Timothy and Colin Mayer, (1988), "The privatisation process in France and the U.K.," *European Economic Review*, 32, pp.482-490

Katz, Barbara G. and Joel Owen (1993), "Privatisation: choosing the optimal time path," *Journal of Comparative Economics* 17, pp.715-736

Katz, Barbara G. and Joel Owen (1995), "Designing the optimal privatisation plan for restructuring firms and industries in transition," *Journal of Comparative Economics*, 24, pp.25-43

Kawalec, Stefan (1989), "Privatisation of the Polish Economy," *Communist Economies*, 1, pp.241-56

Kay, J.A. and Thompson, D.J. (1986), "Privatisation: a policy in search of a rationale," *Economics Journal*, 96, pp.18-32

Kets De Vries, M.F.R. (1977), "The entrepreneurial personality: a person at the crossroads", *Journal of Management Studies*, Vol. 34, pp. 34-57

Kirzner, I.M. (1973), *Competition and Entrepreneurship*. Chicago: The University of Chicago Press.

Kirzner, I.M. (1979), *Perception, Opportunity, and Profit*. Chicago: University of Chicago Press.

Kirzner, I.M. (1982), "Uncertainty, Discovery and Human Action." In: Kirzner, I.M. (ed.) *Method, Process and Austrian Economics*, pp.139-159. Mass: D.C. Heath and Company.

Kirzner, I.M. (1985), "Comment on R.N. Langois, 'From the Knowledge of Economics to the Economics of Knowledge: Fritz Machlup on Methodology and on the "Knowledge Society,"'" in Warren Samuels (eds), *Research in the History of Economic Thought and Methodology*, vol. 3

Knight, F. H.(1922), *Risk, Uncertainty and Profit*. Boston: Houghton Mifflin

Kole, Stacey R. and J. Harold Mulherin, (1997), "The government as a shareholder: a case form the United States," *Journal of Law and Economics*, 40. pp.1-22

Kolodko, G.W. (2001), "The 'New Economy' and Old Problems – Prospects for Fast Growth in Post-socialist Countries", *Tiger Working Paper Series* No.9, Warsaw

Kornai, Janos (1988), "Individual Freedom and Reform of the Socialist Economy," *European Economic Review*, 32, pp.233-267

Kornai, Janos (1993), "The evolution of financial discipline under the post-socialist system," *Kyklos* 46:3, pp315-336

Kornai, Janos (2000), "Ten Years After 'The Road to a Free Economy': The Author's Self Evaluation," working paper, Harvard University, Cambridge, MA.

Krusselberg, H-G. (1969) *Marktwirtschaft und Okonomische Theorie*. Freiburg: Rombach

Kuhn, T (1970), *The Structure of Scientific Revolution*, Chicago: University of Chicago Press, 2nd edition

Kuhnert, S. (2001), "An Evolutionary Theory of Collective Action: Schumpeterian Entrepreneurship for the Common Good", *Constitutional Political Economy*, 12, pp13-29, The Netherlands: Kluwer Academic Publisher

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Rober Vishny, (1998), "Law and Finance", *Journal of Political Economics*, 106, pp.1113-1150

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Rober Vishny, (2000), "Government Ownership of Banks," NBER working paper 7620, National Bureau of Economics Research: Cambridge, MA.

Lachmann, L.M. (1970), *The Legacy of Marx Weber*, London: Heinemann p.36

Laffont, Jean-Jacques and Jean Tirole, (1993), *A Theory of Incentives in Procurement and Regulation*, Cambridge, MA: MIT Press

Lau, Lawrence J., Yingyi Qian, and Gerard Roland, (2000), "Reform without losers: an interpretation of China's dual-track approach to transition," *Journal of Political Economy*, 108, pp.120-143

Lardy, N. (1999), *China's Unfinished Economic Revolution*. Washington, DC: Brookings.

Leontief, W. (1982) Academic economics, *Science* p.217, reprinted in Marr and Raj. 1983, pp331-336

Li, David (1996), "A theory of ambiguous property rights in transition economies: The case of the Chinese non-state sector", *Journal of Comparative Economics* 23, pp.1-19

- Lifton, Roberts (1961), *Robert Lifton's thought reform and the psychology of totalitarianism: a study of 'Brain-washing' in China*. New York: W.W. Norton
- Lieberthal, Kenneth (1985), *Governing China: From Revolution Through Reform*, New York: W.W. Norton
- Limb, M. & Dwyer, C. (2000): *Qualitative Methodologies for Geographers*, London: Oxford University Press Inc.
- Lin, Y.M and Zhang (1999), "Backyard Profit Centres", in: Walder, A. G. and Oi, J.C. (Eds.) *Property Rights of Economic Reform in China*, pp220-226, Stanford, California: Stanford University Press.
- Littlechild, S.C. (1978), *The Fallacy of the Mixed Economy - An 'Austrian' Critique of Economic Thinking and Policy*. London: Institute of Economic Affairs
- Shaomin Li, Shuhe Li, and Weiying Zhang. (2000), "The road to capitalism: competition and institutional change in China", *Journal of Comparative Economics* 28, pp269-292
- Lin, Cyril. (2000), "Corporate governance of state-owned enterprises in China," working paper, Manila: Asian Development Bank
- Lin, Justin Yifu, Fang Cai, and Zhou Li. (1998), "Competition, policy burdens, and state-owned enterprise reform," *American Economic Review*, 88, pp.422-427
- Lin Yifu, Fang Cai, and Zhou Li., (1996), *The China Miracle*. Hong Kong: Chinese University Press.
- Liu Chuanzhi (2001) 'Establishing a computer industry competitive on the world market', in *Science and Technology in China*.
- Liu Wei. (1999), *Elaboration on Property Right System in Economic Reform and Development*, Shoude Jingmao Daxue Chubanshe (Press of Capital University of Economics and Trade)
- Lipton, David, and Jeffrey Sachs (1990), "Privatisation in Eastern Europe: The Case of Poland," Harvard University, September
- Loasby, B.J. (2000), "Market Institutions and Economic Evolution." *Journal of Evolutionary Economics* 10:297-309
- Lopez-de-Silanes, Florencio, Andrei Shleifer, and Robert W. Vishny. (1997), "Privatisation in the United States," *Rand Journal of Economics*, 28, pp. 227-471
- Mahboobi, Ladan. (2000), "Recent Privatisation Trends," *OECD Financial Market Trends*, No.76, pp.43-64

Martin, Stephan and David Parker (1995), "Privatisation and Economic Performance Throughout the UK Business Cycle," *Management and Decision Economics*, 16, pp. 225-237

McClelland, D.C. (1961), *The Achieving Society*, Van Nostrand Rinehold, Princeton, NJ

McCloskey, D. (1985), Rhetoric of Economics, *Journal of Economic Literature*, 21, reprinted in Caldwell, 1984, pp320-517

Meggison, Willian, Robert Nash and Matthias van Randenborgh. (1994), "The financial and operating performance of newly privatised firms: an international empirical analysis," *Journal of Finance*, 49, pp.403-452

Menger, C. (1981), *Principles of Economics*, edited by J. Dingwall and translated by B. H. Hoselitz from the German edition of 1871. New York University Press: New York

Mises, Ludwig von. (1949), *Human Action: A Treatise on Economics*. New Haven: Yale University Press.

Molyneux, Richard and David Thompson (1987), "Nationalised Industry Performance: Still Third – Rate?" *Fiscal Studies*, February, 8, pp48-82

Murrel, P. (1995), "The Transition According to Cambridge, Mass", *The Journal of Economic Literature*, Vol.33, No.1, pp.164-78

Naughton, Barry (1994b), *Chinese Institutional Innovation and Privatization from Below*, American Economic Review, May, vol. 84 No.2, pp266-270

Naughton, Barry (1995), *Growing out of the plan: Chinese economic reform, 1978-1993*, New York: Cambridge University Press

Nellis, John (1999), "Time to rethink privatisation in transition economies?" IFC Discussion paper No.38, Washington D.C.: World Bank Group

North, D.C. (1991), "Institutions." *Journal of Economic Perspectives* 5: 97-112

North, D.C. (1993): Epilogue: Economic Performance Through Time. Prepared for presentation as the prize lecture in economic science in memory of Alfred Nobel, Nobel foundation.

Oi, J.C. (1989), *State and Peasant in Contemporary China*. Berkeley: University of California Press.

Oi, J.C (1999), (Ed.) with Walder. A, *Property Rights of Economic Reform in China*. Stanford, California: Stanford University Press.

Oi, J.C (1995), *The role of the local state in China's Transitional Economy*, The China Quarterly, vol. 144, Dec. p1132

Oi, J.C (1998), *Rural China Takes Off: The Institutional Foundations of Economic Reform*, Berkeley: University of California Press

Olson, M. (1987), "Collective Action." In: *Eatwell, J., Milgate, M., and Newman, P. (eds) The New Palgrave: A Dictionary of Economics*, vol. 1, pp.474-477. London: Macmillan Press

Piatkowski, M. (2002), "The Institutional Infrastructure of the 'New Economy' and Catching-up Potential of Post-Socialist Countries", Tiger Working Paper Series No. 16, Warsaw.

Pilat, D (2002), "Making the New Economy Work – Findings from the OECD growth study", Tiger Working Paper Series No. 17, Warsaw.

Pinto, Brian, Merek Belka, and Stefan Krajewski (1993), "Transforming state enterprises in Poland: evidence on adjustment by manufacturing firms," *Brookings Papers Econ. Act.*, pp213-261

Pohl, Gerhard, Robert E. Anderson, Stijn Claessens, and Simeon Djankov (1997), "Privatisation and restructuring in central and eastern Europe: evidence and policy options," working paper, World Bank Technical Paper No.368, Washington D.C: World Bank

Pollitt, Michael G. (1997), "The impact of liberalisation on the performance of the electric supply industry: an international survey," *Journal of Energy Literature*, 3:2, pp.3-31

Popper, K. (1965), *The Logic of Scientific Discovery*, New York: Harper Torchbooks

Porter, E. M (2002), "Building the Microeconomic Foundations of Prosperity: Findings from the Microeconomic Competitiveness Index", Chapter 1.2, *Global Competitiveness Report*, Oxford.

Putterman, Louis (1995) 'The role of ownership and property rights in China's economic transition,' *The China Quarterly*, No.144, pp.1052-63

Pye, Lucian (1999), *An overview of 50 years of the PRC: some progress, but big problems remain*, *The China Quarterly* Vol. 159, Sep. pp569.

Rawski, T.G. (1999), *China's move to market*, paper presented at 28th Sino-American Conference on Contemporary China held at Duke University, June 12-14, 1999

Reynolds, B. ed (1987), *Reform in China: Challenges and Choices*. New York: M.E.Sharpe.

Rogers J.D. and P. V. Tryon (1983), "Introduction to STARPAC, The Standards Time Series and Regression Package," *NBS TN 1068-1*, U.S. Government Printing Office.p.166

Ros, Agustin J. (1999), "Does ownership or competition matter? The effects of telecommunications reform on network expansion and efficiency," *Journal of Regional Economy*, 15, pp.65-92

Ruttan, V.W., and Yujiro Hayami (1984), "Toward a Theory of Induced Institutional Change," *The Journal of Development Studies* 20(4): 203-22.

Sabin, Lora (1994), 'New bosses in the workers' state,' *The China Quarterly*, No. 140

Sachs, Jeffrey, Clifford Zinnes, and Yair Eilat (2000), "The gains from privatisation in transition economies: Is change of ownership enough?" CAER II Discussion paper 63, Harvard Institute for International Development, Cambridge, MA.

Sachs, J. & Woo, W.T., (2003), *China's Economic Growth After WTO Membership*, *Journal of Chinese Economic and Business Studies*, Vol. 1, No.1, pp1-31

Sanders R. (2000) *Prospects for Sustainable Development in the Chinese Countryside*, Ashgate

Samuels W.J. & Medema. S.G. (1997), *Coasean Economics: Law and Economics and the New Institutional Economics*. Boston, MA: Kluwer Academic Publishers

Schaffer, Mark E. (1998), "Do firms in transition economies have soft budget constraints? A reconsideration of concepts and evidence," *Journal of Comparative Economics*, 26, pp.80-103

Scherer, F.M. (1999), "New perspectives on Economic Growth and Technological Innovation." *Brookings Institution Press*, Washington D.C.

Schleifer, Andrei (1998), "State Versus Private Ownership", *Journal of Economic Perspectives*, 12, pp133-150

Schleifer, A and Vishny, R.W. (1998), *The Grabbing Hand: Government Pathologies and Their Cures*, *Cambridge, MA: Harvard University Press*.

Schmitz, Patrick W. (2001), "The Coase Theorem, Private Information and the Benefits of Not Assigning Property Rights", *European Journal of Law and Economics*, 11:1, pp23-28.

Schumpeter, J. A. (1934) "The Nature and Necessity of a Price System", *Economic Reconstruction*, pp.81-86,

Schumpeter, J. A. (1947), "The Creative Response in Economic History", *Journal of Economic History*, p.150

Schumpeter, J. A. (1961 [1911]), *A Theory of Economic Development*. Oxford: Oxford University Press

Schumpeter, J. A. (1975), *Capitalism, Socialism and Democracy* New York: Harper [reprinted from orig. pub. 1942], pp. 82-85

Schutz, A. (1970), *On Phenomenon and Social Relations*. Chicago: The University of Chicago Press, pp. 111-112

Shackle, G.L.S. (1968), *Uncertainty in Economics*, C.U.P., Cambridge

Shackle, G.L.S (1979), *Imagination and the Nature of Choice*,

Shackle, G.L.S (1983), "The Bounds of Unknowledge", 1983, In: Wiseman, (eds), *Beyond Positive Economics*, pp. 28-37

Shapiro, C. and Varian, H.R. (1998), *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press.

Shere, J. (1982), "Tolerance of ambiguity as a discriminating variable between entrepreneurs and managers", Academy of Management Conference, New York, NY

Sheshinski, Eytan and Luis Felipe Lopez-Calva (1999), "Privatisation and its benefits: theory and evidence," HIID Development Discussion Paper No. 698, Harvard University, Cambridge, MA.

Shirley, M & Colin Xu. (2001), "Empirical Effects of Performance Contracts: Evidence from China." *Journal of Law, Economics, and Organisation* 17 (1): 168-200

Silverman, D. (1993), *Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction*, London, Sage

Sjostrand, S, E. (1995), "Towards a Theory of Institutional Change." In: Groenewegen, John et al. (eds.) *On Economic Institutions: Theory and Applications*, pp. 19-44. Aldershot: Edward Elgar

Solinger, Dorothy J (1984), *Chinese Business under socialism*, Berkeley: Univ. of California Press, p. 308-309.

Solinger, *China's Transition*, p. 134

Stanfield, R. (1974), "Kuhnian Scientific Revolutions and the Keynesian Revolution." *Journal of Economic Issues*, 8, No. 1, pp. 97-109

Steinfeld, E. (1998). *Forging Reform in China: The Fate of State-Owned Industry*. Cambridge: Cambridge University Press.

Stigler, G, (1959), "The politics of political economists", *Quarterly Journal of Economics*, 73

- Stiglitz, J.E., (1989), *"On the Economic Role of the State."* Reprinted in Heertje, A., *The Economic Role of the State*. Oxford: Blackwell.
- Stiglitz, J.E. (1994), *Whither Socialism?* Cambridge, MA: MIT Press.
- Stiglitz, J.E. (1998), "The private uses of public interests: incentives and institutions," *Journal of Economic Perspectives*, 12, pp.3-22
- Summers, L.H. (2000), *"The new economy: towards an era of unprecedented growth?"*, World Economic Forum Autumn Meeting 2000, <http://www.weforum.org/site/knowledgenavigator.nsf/>
- Svejnar, J. (1990), "Productive efficiency and employment", *China's Rural Industry: Structure, Development, and Reform*, (ed.) Byrd, W.A. and Lin Qingsong. Oxford: Oxford University Press. Pp.243-54
- Tawney, R.H. (1948), *The Acquisitive Society*. New York: Harcourt.
- 1981: "Property and creative work". In B.B. Macpherson (ed.), *Property: Mainstream and Critical Positions*, Toronto: University of Toronto Press, pp.135-51
- Tian Guoqiang (2000), "Property rights and the nature of Chinese collective enterprise", *Journal of Comparative Economics*, 28, pp.247-268
- Usher, D. (1998), "The Coase Theorem is Tautological, Incoherent or Wrong", *Economics Letters* 61, pp.3-11
- Vanberg, V.J. (1986), *"Spontaneous Market Order and Social Rules: A Critique of F. A. Hayek's Theory of Cultural Evolution."* *Economics and Philosophy* 2: 75-100
- Veblen, T.B. (1899), *The Theory of the Leisure Class: An Economic Study in the Evolution of Institutions*. New York: Macmillan.
- Vickers, John and George Yarrow (1991), "Economic perspectives on privatisation," *Journal of Economic Perspectives*, 5, pp.111-132
- Vining, Aidan R. and Anthony E. Boardman (1992), "Ownership Versus Competition: Efficiency in Public Enterprise", *Public Choice*, 73, pp.205-239
- Walder, A. G. (1994), "Corporate organisation and local government property rights in China", in Milor pp.53-66
- Walder, A.G. (1995), *China's Transitional Economy*, *China Quarterly*, December, pp.965-979
- Walder, A. G. and Oi, J.C. (1999), "Property Rights in the Chinese Economy: Contours of the Process of Change", In: Walder, A. G. and Oi, J.C. (Eds.) *Property Rights of Economic Reform in China*, pp.2-23, Stanford, California: Stanford University Press.

Wang Huijiong, Li Shantong (1995), *Industrialization and Economic reform in China*, New World Press

Wasserfallen, Walter and Stefan Muller (1998), "Deregulation and privatisation: evidence from the telecommunication industry in Europe and implications for Switzerland," working paper, Studienzentrum Gerzensee, Switzerland

Watson, K., Hogarth-Scott, S. et al (1998), "Small business start-ups: success factors and support implications", *International Journal of Entrepreneurial Behaviour & Research*, Vol.4 No.3, pp. 217-38

Wei Jie (1999), *Discrimination of Modern Property right system*, Shoudu Jinmao Daxue Chubanshe (Press of Capital University of Economics and Trade)

Weitzman, Martin L & Chenggang Xu (1994), "Chinese Township-Village Enterprises as Vaguely Defined Cooperatives", *Journal of Comparative Economics* 18, pp121-145

White G. (1993): *Riding The Tiger – The Politics of Economic Reform in Post-Mao China*, London: The Macmillan Press

Wiles, R.C. and Weintraub (1981), "Methodological Basis of Policy Conflict", *Journal of Post Keynesian Economics*, 3:3. pp.325-339.

Wilber, C.K., and Harrison. R.S. (1983), The methodological basis of institutional economics: pattern model, storytelling and holism. Marr and Raj (eds.), *How Economists Explain - A Reader in Methodology*. Lanham, MD: University Press of America, pp.243-272

Williams, H. (1977), Kant's concept of property. *Philosophical Quarterly*, 27, pp32-40

Williamson, O. (1994), "Public and Private Bureaucracies," Mimeo

Wiseman, J. (1989) (ed.): *Cost, choice and political economy*. Aldershot: Edward Elgar, pp.230

Woo, W.T., Hai, W., Jin, Y., and Fan, G., (1994), *How Successful has Chinese Enterprise Reform Been? Pitfalls in Opposite Biases and Focus*, *Journal of Comparative Economics*, June, pp410-437

Wu, Jinglian (1993), *Dazhong xing qiye gaige (Large and Medium State-owned enterprise reform)*, Tianjin Renmin Chubanshe

Wu, Jinglian (1995), Comments on 'Improving state-owned enterprise performance: recent international experience.' In Broadman 1995

Yarrow, George (1986), "Privatisation in theory and practice," *Economic Policy*, 2, pp.324-364

Yergin, Daniel and Joseph Stanislaw (1998), *The Commanding Heights: The Battle Between Government and the Marketplace That is Remaking the Modern World*, New York: Simon & Schuster

You Ji (1998), *China's enterprise reform--changing state/society relations after Mao*. Routledge, p3

Yu, Tony Fu-lai, (2001), An Entrepreneurial Perspective of Institutional Change, *Constitutional Political Economy*, 12, pp.217-236

Yue Haitao (1987), 'Leasing invigorates small business,' Beijing Review, No.27, p.25

Zerbe, Richard Jr & Medema, S. (1998), "The Coase Theorem", Bouckaert and DeGeest (eds.) *The Encyclopedia of Law and Economics*, 1998 Aldershot: Edward Elgar

Zerbe, Richard Jr & Medema, S. (1997), "Ronald Coase, the British Tradition, and the Future of Economic Method" in *Coasean Economics: Law and Economics and the New Institutional Economics* (ed. by Steven G. Medema), Boston: Kluwer Academic Publishers.

Zhang Junkuo (2001), "China's State Assets Management System: How the State Exercises Its Ownership." World Bank, Washington, D.C.

Zhou Shuliang (1986), Reform of the planned economy and planning system *Contemporary Chinese Economy, Jinji ChuBanshe* (Economy Press), Beijing, p.3
China Statistical Yearbook 1989, Beijing, *Zhongguo Tongji Chubanshe*, p.267

Beijing Test Zone Report 1992, 2000

China Statistical Yearbook 1997, Beijing, *Zhongguo tongji chubanshe*, p.415

China Statistical Yearbook 2000, Beijing, *Zhongguo tongji chubanshe* P.688

China: Facts & Figures 2001- Basic Statistics on Higher Education for Scientific and Technological Activities, New Star Publishers, Beijing

Jingji Ribao (Economic Daily) the June 16

"New Economy Task Force Report: Making the New Economy Grow" (2000), In: PPI, Policy Agenda, July 19, 2000 <http://www.ppionline.org/ndol>

People's Daily (Renmin Ribao), 10 August 1987, p.2

"Reports on the development of China's laser industry", Basic Research High-tech Department, the Ministry of Science. 2000, Beijing

"Rules of the Road: Governing Principles for the New Economy" (1999), In: The New Economy Task Force, Key Document, September 13, 1999
<http://www.ppionline.org/ndol>

The 863 Program Annual Report 2001, <http://www.863.org.cn>

The National High Technology Research and Development Program of China, Annual Report 1999, And Annual Report 2000: Ministry of Science and Technology

“The New Economy: It works in America. Will it go global?” *Business Week*, Jan 31, 2000

“The Report of High-tech Development: 2000”, the Chinese Academy of Science, Beijing