USE OF THESES

This copy is supplied for purposes of private study and research only. Passages from the thesis may not be copied or closely paraphrased without the written consent of the author.
What Contributed to China’s Rapid Rural Industrial Growth During the Reform Period?

WANG Xiaolu

Thesis submitted for the degree of Doctor of Philosophy
at the Australian National University

November 1997
To the memory of my parents
The work contained in this thesis is my own, except where otherwise indicated.

WANG Xiaolu
November 1997
Acknowledgments

I am indebted to many people, who provided assistance with this thesis, especially the members of my supervision panel. I was first encouraged by Dr Kalirajan to study towards a PhD degree, when he was supervising me in my Masters’ research essay. Since then he has provided me with continued support and assistance, not only in econometrical modeling and data preparation, and in discussion of the economic situation in China, and other developing countries, but in many other ways. Without his help my study could not have been completed.

Professor Ross Garnaut is a famous economic expert on China and Asian-Pacific economic issues, who has given me crucial encouragement in choosing the research area and topic of my thesis, and in my initial study plan. I benefited greatly from his encouragement, suggestions and corrections on the drafts of my thesis.

I received detailed constructive suggestions and critical questions from Dr George Fane, relating to theoretical and practical issues. These helped me to avoid mistakes and improve my thesis, and to make it understandable for readers who do not work in the area of the Chinese economy.

I am grateful for Professor Warwick McKibbin’s help, for Dr Rick Shand’s valuable comments and advice. Professor Peter Warf’s suggestion for endogenizing capital stock in my two-sector model also made an important improvement to my thesis. I benefited from discussion with Dr Ross McLeod about collective firm behavior, and with Professor Masa Fujita of the University of Kyoto (he is also an adjunct professor in the United Nations University in Tokyo). Many other comments and suggestions made by academic staff members and graduate students in the Australian National University, and also the United Nations University, were helpful for my study. Of course, I am fully responsible for the opinions expressed and any possible mistakes in the thesis.
Mrs Carol Kavanagh carefully read all the drafts of the chapters, and made corrections to the language problems. This has improved the readability of the thesis.

I am obliged to the Department of Economics, Research School of Pacific and Asian Studies, Australian National University for hosting me to study towards a PhD degree, and to the ANU for awarding me a scholarship. I would like to thank Professor Tarcisio Della Senta, Dr Fu-chen Lo, and the Institute of Advanced Studies in the United Nations University, and Professor Justin Yifu Lin, his colleges, and the China Center for Economic Research in the Peking University, for providing research facilities and financial support for my continued study during the periods I visited these two institutions. Part of this thesis was done there. I would also like to thank my friends and former colleagues, Mr Zhang Shaojie, Luo Anyi, Bai Nanfeng and the Hengtong Industry Corporation, for their financial support for my fieldwork in China, and Du Ying in China’s Ministry of Agriculture for his arrangement for my field survey. I also benefited from the help of many other friends, in Australia and China, in so many ways that I cannot list them all, but I would like to thank all of them.
Abstract

This thesis examines the reasons for the dramatic growth of China’s non-agricultural rural industrial sector, or Township and Village Enterprises (TVE) sector, during the period of economic reform. TVE growth largely explained China’s rapid economic growth during this period. The study focuses on the remarkable phenomenon of rapid transfer of rural labor from the agricultural sector to the TVE sector, and on the effect of institutional changes on this transfer.

A two-sector model is established to analyse the effect of institutional change on China’s rural industrial growth. This model explains the reallocation of labor between the two sectors as a result of removing institutional restrictions on labor allocation and on rural non-agricultural activities. Using provincial level data, the estimation result suggests that institutional restrictions in the pre-reform period resulted in a large gap in the values of the marginal product of labor between the two rural sectors. The MPLs were gradually converging, indicating a reduction of institutional cost. From the estimation, institutional change is found to have contributed six percentage points to the average 21.7 percent TVE growth rate, during the period 1980-92. TFP growth rate was 4.7 on average. These two effects together contributed half of the TVE growth rate. Therefore, they were the most important contributors. Resulting from the improvement in factor allocation, rural economic growth at the aggregate level is also found to have accelerated.

Although institutional change made a remarkable contribution to rural industrial growth, the tendency of MPL convergence is found to be slow, and the MPL gap was still high in 1992. In investigating the reason, the collective-owned rural enterprises, which were the major components of the TVE sector, are found to be more conservative than private enterprises in admitting new workers from outside the local community. Although the collective enterprises played an important role, and achieved a remarkable performance in rural industrialization, this behavior led to low
labor mobility and a sub-optimum allocation of labor in the short-run, given that the markets for other factors were imperfect. It reduced employment opportunities, and was partially responsible for the MPL gap. The econometric analysis in this thesis shows a significant relationship between the concentration ratio of collective enterprises in the TVE sector and the MPL gap. This implies that the recent TVE ownership structural reform in some regions has the potential to further improve factor allocation in the rural economy, and sustain rapid rural industrial growth for a longer period.

Although various market distortions still exist, in general, the market-oriented TVE sector has achieved great success. Using a two-sector analytical framework, improved from the literature, it is found that the TVE sector not only directly contributed to China’s economic growth, but also made indirect contribution, through its externality on the growth of the state owned enterprise sector. This externality can be explained as the pressure of market competition, which forced the partially market-oriented SOEs to increase their efficiency. Although SOEs have experienced difficulties due to some institutional weaknesses, and loss of monopolistic status, this positive externality at least partially offset these negative effects on their growth. As additional evidence, the above finding is supported by SOEs’ technical indicators, by classifying industrial branches according to the extent of competition.

The above findings suggest that institutional change in the reform period played very important role in China’s rural industrial growth, and economic growth. They also imply great potential for rapid economic growth in the future as a result of further improvements in the institutional framework. In the long run, when the institutional effects diminishes, sustainable growth will rely more on technical progress and human capital accumulation.
## Content

Acknowledgments iv  
Abstract vi  
Content viii  
List of Tables x  
List of Figures xii  

### CHAPTER 1. INTRODUCTION  
1.1 The Questions to be Answered 1  
1.2 The Importance of the Study 5  
1.3 Outline of the Study 8  

### CHAPTER 2. A REVIEW ON DEVELOPMENT OF CHINA'S RURAL INDUSTRY  
2.1 Some Concepts 13  
2.2 A Historical Background of Rural Industrialization before Reform 17  
2.3 Development of Rural Industry during the Reform Period 23  
2.4 Factor Intensity and Industrial Structure 33  
2.5 Regional Distribution of Rural Industry 36  
2.6 Summary 40  

### CHAPTER 3. LITERATURE REVIEW: ECONOMIC GROWTH AND INDUSTRIALIZATION  
3.1 Introduction 43  
3.2 Literature on Economic Growth in East Asian and China 48  
3.3 Long-run Growth Models 57  
3.4 Theories of Dynamic Growth 67  
3.5 Theories of Industrialization 70  

### CHAPTER 4. MODELING INSTITUTIONAL EFFECT ON RURAL INDUSTRIAL GROWTH  
4.1 Introduction 79  
4.2 A Two-sector Model for Examining Institutional Effect On Growth 82  
4.3 Summary 92  
Appendix 4.1 Deriving the Institutional Effect 93  

### CHAPTER 5. CONTRIBUTION OF INSTITUTIONAL CHANGES TO RURAL INDUSTRIAL GROWTH—AN EMPIRICAL STUDY  
5.1 The Empirical Model and Data 102  
5.2 Estimation Results 107  
5.3 A Decomposition of Growth: Contribution of Institutional Change and Other Factors 113  
5.4 Interest Control and Capital Misallocation 118
5.5 Summary
Appendix 5.1 Estimation Results and Data
Appendix 5.2 Test for Constant Returns to Scale
Appendix 5.3 A Translog Estimation for MPL differential

CHAPTER 6. FIRM BEHAVIOR AND FACTOR ALLOCATION IN CHINA'S RURAL INDUSTRY
6.1 Introduction
6.2 TVOE Behavior and Wage Differential: Empirical Evidences
6.3 Income Maximization and Employment: A Theoretical Description
6.4 An Empirical Test
6.5 Summary

CHAPTER 7. EXTERNALITIES AND RELATIVE PRODUCTIVITY BETWEEN THE TVE AND THE STATE SECTOR
7.1 Growth Performance of the TVE and State Sectors
7.2 Productivity and Externality in the State and Non-State Sectors
   – A Literature Review
7.3 Estimating Externalities and Relative Productivity Between the TVE and State Sectors
7.4 Summary
7.3 Appendix 7.1 Estimations of Externalities and Relative Productivity Using the F-R Model

CHAPTER 8. CONCLUSION

APPENDIX A1. RECALCULATION OF TVE OUTPUT AND GROWTH RATE

APPENDIX A2. CALCULATION OF CAPITAL STOCK IN THE TVE AND AGRICULTURAL SECTORS

BIBLIOGRAPHY
List of Tables

Table 2.1 China’s Rural and Urban Sectors 17
Table 2.2 Economic Growth Rate by Sectors 27
Table 2.3 Development of TVEs 28
Table 2.4 Land, Rural Population and Rural Income in China 29
Table 2.5 Bank Credit as Shares of TVEs’ Total Capital 31
Table 2.6 Capital-labor ratio in the TVE and State Sectors 33
Table 2.7 TVE Output, Employment and Firm Number by Industry and by Ownership 34
Table 2.8 Industrial Structure and Ownership Structure of the TVE Sector 34
Table 2.9 Structure Change of the Rural Industry 35
Table 2.10 Regional Distribution of the Total Output and Employment of TVEs 37
Table 2.11 Rural Input and Output Growth Rates: by Sector and by Region 38
Table 5.1 Estimation Results: Factor Contribution 107
Table 5.2 TFP Growth By Sector and by Region 108
Table 5.3. Changing Relative MPL and MPK 109
Table 5.4. Impacts of Policy Changes on TVE employment 111
Table 5.5 Estimated and Expected B_L 115
Table 5.6 Decomposition of Rural Industrial Growth 116
Table 5.7 Decomposition of Average Sectoral Growth Rate 117
Table 5.8 Interest Rates of State Bank Loans 118
Table 5.9 Balance of ABC and RCC Loans in the Two Sectors 120
Table 5.10 Repayment Rate of Bank Loans in the Two Sectors 120
Table 5.11 Estimation Results: Production Functions, Relative MPL and MPK 123
Table 5.12 Continued: Annual Changes in TFP, MPL, and MPK 124
Table 5.13 TFP Level and Growth Rate 125
Table 5.14 Changing MPL Ratio and MPK Ratio 125
Table 5.15 Nation-Wide Input and Output Level and Growth Rates 126
Table 5.16 Elasticities of the Institutional Factor, and the Expected B_L 127
Table 5.17 Decomposition of Industrial and Agricultural Growth 128
Table 5.18 A Translog Estimation Result 131
Table 6.1 Origins of TVE Workers in Sample Counties 138
Table 6.2 Workers’ Origins in TVEs and Private Firms 139
Table 6.3 Comparing Agricultural Labor Earning and TVE Wage 142
Table 6.4 The “TVOE Effect” on MPL Ratio: the Estimation Result 156
Table 6.5 Calculated “TVOE Effect” on MPL Ratio 157
Table 6.6 Ownership Structure and “TVOE Effect” by Region 157
Table 7.1 Shares of the State and Non-state Sectors in Industrial Output 161
Table 7.2 Employment Level and Growth in the State and Non-state Sectors 163
Table 7.3 Input and Output Growth in the TVE and State sectors 164
Table 7.4 Measures of Innovation Achievement and Capacity 168
Table 7.5 Estimation Results 176
Table 7.6 Contribution of the TFP andExternality to Growth 178
Table 7.7 Marginal Factor Productivity in the TVE and State Sectors 180
Table 7.8 Technical Indicators for the State Industrial Branches 183
Table 7.9 Growth Rates of the NSE and SOE Sectors
Table 7.10 Direct and Indirect Contribution of the NSE Sector to Economic Growth
Table 7.11. Estimation Results
Table 7.12 Calculated Parameters for the Three Models
Table 7.13 Some Results of Diagnostic Tests
Table A1.1 Different Calculations for TVE Output Level and Growth Rates
Table A1.2 Derived TVE Output in Current Prices by Province
Table A1.3 Derived TVE Output by Province in 1980 Price
Table A1.4 TVE Growth Rates by Province and by Region
Table A2.1 Calculated Capital Stock in the TVE Sector by Province
Table A2.2 Calculated Capital Stock in the Agricultural Sector by Province
Table A2.3 Capital Stock and its Growth Rate in the TVE and Agricultural Sectors
<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Industrial Output Value of the State and TVE Sectors</td>
<td>28</td>
</tr>
<tr>
<td>3.1</td>
<td>Industrial &quot;Take-Off&quot; in the Ranis-Fei Model</td>
<td>77</td>
</tr>
<tr>
<td>4.1</td>
<td>Institutional Cost to Labor Reallocation</td>
<td>84</td>
</tr>
<tr>
<td>4.2</td>
<td>Institution Effect with Endogenous Capital</td>
<td>86</td>
</tr>
<tr>
<td>5.1</td>
<td>Estimated and Expected MPL Ratio</td>
<td>115</td>
</tr>
<tr>
<td>6.1</td>
<td>Firm Behaviour and Labor Allocation in a Local Community</td>
<td>148</td>
</tr>
</tbody>
</table>