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IFPRI Discussion Paper 00705

May 2007

The Role of Clustering in Rural Industrialization: A Case Study of the Footwear Industry in Wenzhou

Zuhui Huang, China Academy for Rural Development, Zhejiang University
Xiaobo Zhang, International Food Policy Research Institute and Zhejiang University
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Development Strategy and Governance Division

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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CONTENTS

| | |
|--|----|
| Acknowledgments | v |
| Abstract | vi |
| 1. Introduction | 1 |
| 2. An Overview of the Wenzhou Footwear Cluster and Survey Design | 3 |
| 3. Overcoming Technical Constraints | 7 |
| 3.1 Features of the Entrepreneurs | 7 |
| 3.2 The Diffusion of Footwear Technology | 9 |
| 3.3 Division of Labor Lowers Technical Constraints | 11 |
| 4. Overcoming Capital Constraints | 13 |
| 4.1 The Constraints of Start-up Capital Investments | 13 |
| 5. Breaking Institutional Constraints | 16 |
| 5.1 Avoiding ownership risk | 16 |
| 5.2 Reducing Contract Performance Risk | 16 |
| 6. Lessons from this Case | 18 |
| References | 20 |

TABLES

| | |
|---|----|
| Table 1: Summary Statistics of the Survey | 6 |
| Table 2: Characteristics of Entrepreneurs at the Time of Starting Their Firms | 8 |
| Table 3: Backgrounds of the Founders of Four Enterprises Derived From the Dongfanghong Shoemaking Factory | 11 |
| Table 4: Intermediary Products of Shoes | 12 |
| Table 5: Sources of Start-up Funds | 13 |
| Table 6: The Amount of Start-up Funds During Different Periods (1000 <i>yuan</i>) | 14 |
| Table 7: Preferred Channels to Raise Working Capital | 15 |
| Table 8: The Patterns of Trade Credits from Upstream Suppliers | 15 |
| Table 9: Conflict Resolution Modes between Enterprises | 17 |

FIGURES

| | |
|--|----|
| Figure 1. The Structure of the Wenzhou Footwear Cluster | 5 |
| Figure 2. Footwear Output in Wenzhou (1978-2004) | 6 |
| Figure 3. Diffusion of Footwear Production Techniques and Knowledge in Wenzhou | 10 |

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ABSTRACT

Wenzhou used to be one of the poorest regions in eastern China. With limited arable land, poor road access to major cities, and little support from the upper level governments, this region seemed to lack all the conditions necessary for economic growth. However, over the past several decades Wenzhou has developed the most dynamic private sector in China, and has accordingly achieved one of the fastest growth rates. In particular, the footwear industry in Wenzhou has grown from a negligible market share to the largest in China. Here, we report a survey of 140 Wenzhou-based footwear enterprises of various scales, and use this information to examine the driving forces behind the dramatic rural industrial growth seen in this region. Our results show that clustering deepens the division of labor in the production process and makes it possible for small entrepreneurial firms to enter the industry by focusing on a narrowly defined stage of production. Therefore, Wenzhou represents an example of how clustering plays a significant role in helping fledgling rural industries overcome the growth constraints of capital and technology in the incipient stage of industrialization.

Keywords: cluster; industrialization; finance; economic development; nonfarm economy.

1. INTRODUCTION

Located in the mountainous south-eastern part of Zhejiang Province, Wenzhou prefecture has a very limited amount of arable land at 0.52 *mu* (15 *mu*=one hectare) per capita, about one-third of the national average (Zhang and Li, 1990). Wenzhou's proximity to Taiwan made it a likely war frontline in the planned economy era from 1949 to the late 1970s, meaning that neither the central or provincial (Zhejiang) governments were inclined to spare their limited resources for Wenzhou's infrastructural and industrial development (Tsai, 2002). From 1949 to 1981, only 655 million *yuan* of public funds were invested in Wenzhou Prefecture (Zhang and Li, 1990), compared to an investment of 2.8 billion *yuan* in the neighboring Ningbo prefecture. Wenzhou also suffered from poor transportation, relying upon a single narrow mountain road for transportation of people and goods.¹ As a result, prior to reform in the late 1970s, the per capita income in Wenzhou was only 55 *yuan*, about one third of the provincial average (Zhang and Li, 1990). Wenzhou seemed to lack all the necessary conditions for textbook economic growth. Despite such unfavorable initial conditions, however, Wenzhou has developed the most dynamic private sector in China over the past several decades, with the result that it has shown one of the fastest growth rates in the country.² The footwear industry in particular has grown from a negligible input to the largest market share in China, and today forms one of the largest industrial clusters in the country.

How did Wenzhou succeed in overcoming the capital and technical constraints of the industrialization process? What are the major factors that contributed to the formation of rural industrial clusters? Parris (1993) argued that local state corporatism was a major reason for growth in Wenzhou. Whereas Tsai (2002) stressed the importance of informal finance and other institutional innovations, and Zhang and Li (1990) identified a long list of factors contributing to the success of the "Wenzhou Model". However, it is not possible to single out specific factors as being more important than others. This paper contributes to the literature from a different perspective by arguing that clustering has helped overcome the technical and capital barriers to entry for a large number of entrepreneurs.

Here, we surveyed 140 Wenzhou-based footwear enterprises of various scales, and use the accumulated data to examine the driving forces behind the dramatic rural industrial growth seen in this region over the past few decades. Given that many developing countries and regions face similar pressures of land scarcity and poor infrastructure, the lessons and experiences drawn from the in-depth

¹ Wenzhou Airport and Jin-Wen Railway were not completed until 1990 and 1998, respectively.

² Although GDP per capita in Wenzhou was 63 percent of the Chinese average in 1978, these values equalized in the early 1990s and the GDP per capita in Wenzhou was 78% higher than the national average in 2004 (Wenzhou Statistical Yearbook 2005, and China Statistical Yearbook 2005).

case study in Wenzhou may contribute to the literature on rural industrialization in other developing countries or regions.

Section 2 briefly reviews the history of the Wenzhou footwear industrial cluster and describes our survey design. Sections 3 to 5 demonstrate how clustering helps overcome the technological, capital and institutional constraints in the process of industrialization. Finally, Section 6 summarizes the major findings and draws some lessons from this case study.

2. AN OVERVIEW OF THE WENZHOU FOOTWEAR CLUSTER AND SURVEY DESIGN

The traditional footwear industry has a history of over 500 years in Wenzhou. During the Ming Dynasty (1368-1644), Wenzhou footwear was renowned for its exquisite quality and was produced explicitly for the royal family. At the end of the Qing Dynasty and the beginning of the Republic of China (1911), the Wenzhou footwear industry began to flourish. Fuqian Street, located in the heart of the city, was lined with dozens of footwear stores.

In the 1920s, Shanghai, Xiamen and other cities employed workers from Wenzhou to make shoes. These shoemakers mastered advanced shoemaking processes, which they then brought back to Wenzhou. They became key technicians in the local footwear industry, and exerted a far-reaching influence on the development of the contemporary shoemaking industry in Wenzhou. In 1950, there were 43 family footwear workshops and 103 employees in urban Wenzhou with annual output of 4,000 pairs of shoes (Yu and Yu, 1995).³ Soon after, however, many of the private workshops and factories were nationalized or closed. The private shoemaking was largely depressed in the following three decades. By 1978, there were only 19 footwear factories left, including two state-owned, eight collectively owned and nine privately owned shops, with a combined output of 496,800 pairs of shoes per year.⁴ These “seed factories” trained a large number of technical workers, marketing specialists, and management talents, laying the groundwork for the emergence of the Wenzhou shoemaking industry in the subsequent reform era.

After 1978, the Wenzhou private shoemaking business recovered rapidly. As state- and collectively-owned businesses gradually went under, more and more ex-employees set up their own workshops and the local shoemaking business boomed. By the end of 1981, there were 99 shoemaking factories in the Lucheng district of Wenzhou alone (Wenzhou City Annals, 1998). As of 2006, Wenzhou had become the most important footwear production base in China and was nicknamed the “Footwear Capital of China.” As shown in Figure 1, since the reform in the late 1970s, Wenzhou gradually formed a highly specialized and coordinated industrial cluster consisting of over 4,000 shoemaking factories (over 30 leading companies with a yearly output value of more than 100 million *yuan*), 200 leather enterprises, 380 footwear sole enterprises, 200 footwear machine manufacturers, 168 footwear last factories, 100

³ Wenzhou City Annals, Zhang Zhicheng, Wenzhou City Annals Compilation Committee, Beijing, Chunghua Bookstore, 1998.

⁴ Wenzhou City Annals, Zhang Zhicheng, Wenzhou City Annals Compilation Committee, Beijing, Chunghua Bookstore, 1998.

footwear accessories and ornamental materials enterprises, 50 footwear design studios, and numerous specialized footwear-related information service agents, training schools, research institutes, and family workshops. These enterprises, institutions, and household workshops were linked together via numerous specialized markets, such as the Wenzhou “Footwear Capital” Market, the Hetongqiao Footwear Accessories and Ornamental Materials Market, the South Zhejiang Footwear Accessories and Ornamental Materials Market, the Original Leather Market, the Leather and Footwear Machine Market, and the Leather Chemical Market. In 2004, the total output of the Wenzhou footwear cluster amounted to 835 million pairs (including 452,980,000 leather shoes, 3,440,000 cloth shoes, and 378,630,000 rubber shoes),⁵ and the cluster employed over 400,000 people.⁶ As shown in Figure 2, total shoe production in this region increased from 500 thousand pairs in 1978 to 835 million pairs in 2004, with an annual growth rate of 33%.

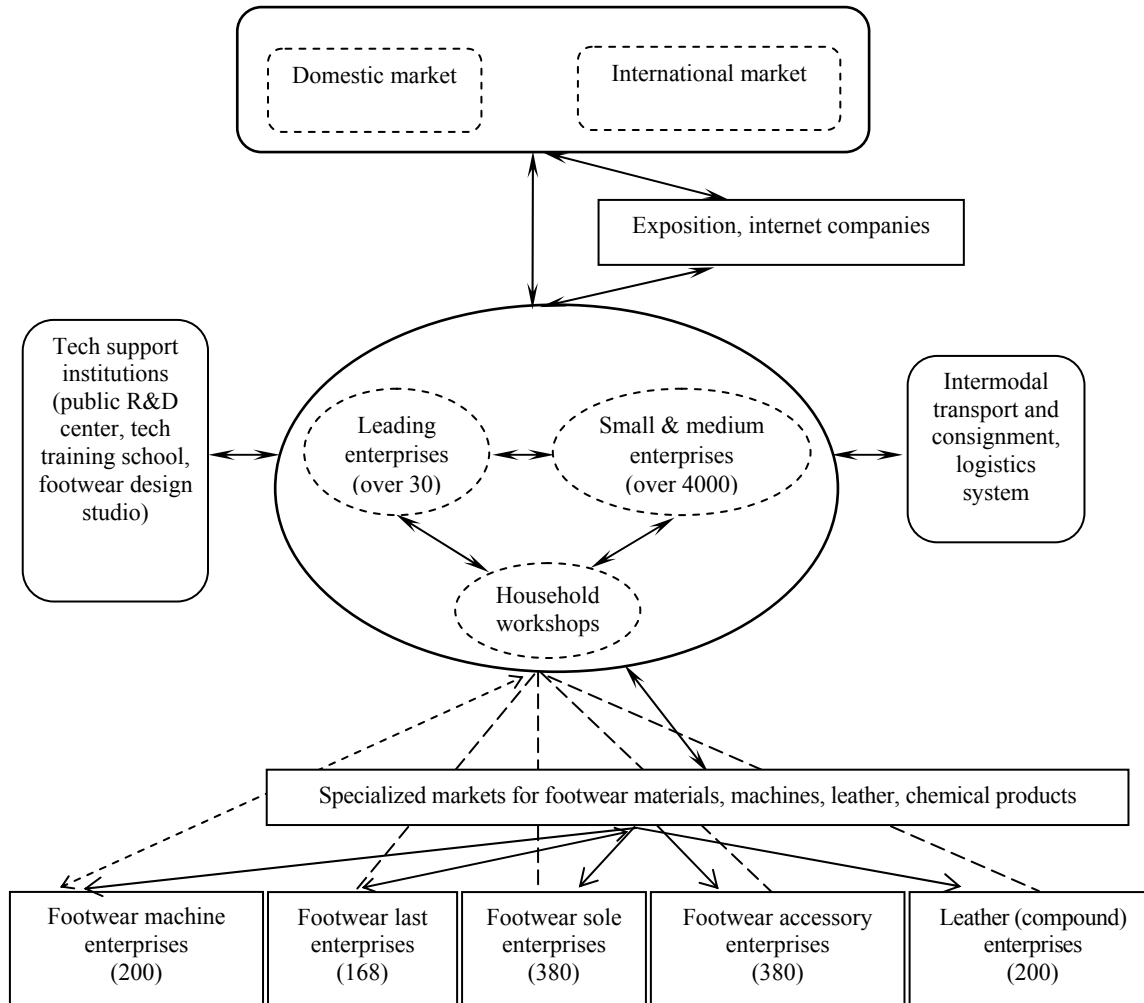
For the present study, we first interviewed numerous individuals from government agencies, industrial associations, and enterprises in order to design and pretest our questionnaire.⁷ From July to October 2005, we conducted a formal field survey in the key footwear production bases, including the Footwear Capital of China Industrial Park in the Lucheng District of Wenzhou City, the Shuangyu Industrial Park of Lucheng District, Oubei Township of Yongjia County, and Xincheng Township of Ruian City. We randomly selected our samples from firm lists provided by local governments or the industrial park administrative departments, interviewed the key managers or owners, and filled in the questionnaire. In total, we surveyed 140 footwear-related enterprises, which account for 2.77% of the total number of enterprises in the Wenzhou footwear cluster. Table 1 presents summary statistics of the survey.

⁵ Wenzhou Statistical Yearbook (2005).

⁶ Wenzhou Footwear and Leather Industry Association.

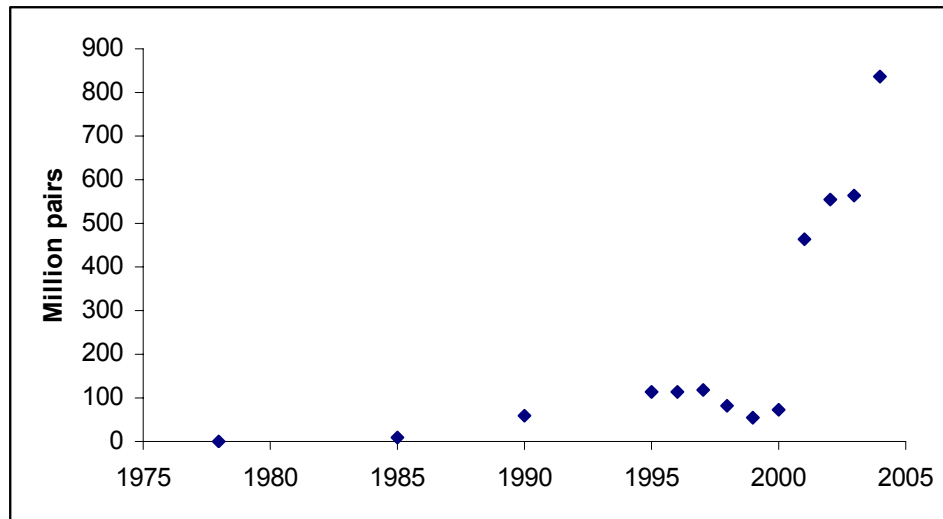
⁷ The questionnaire is available from authors upon request.

Figure 1. The Structure of the Wenzhou Footwear Cluster



Source: Footwear Leather Association of Wenzhou City, Footwear Materials Chamber of Commerce, and Authors' field survey.

Figure 2. Footwear Output in Wenzhou (1978-2004)



Source: The data for 1995-2004 are from the Wenzhou Statistical Yearbooks of the corresponding years (1996-2005), whereas the data for 1978, 1985 and 1990 are from the Wenzhou City Annals (1998).

Table 1: Summary Statistics of the Survey

| Types of products | Sample size | | | No. of employees in the sample | | | |
|------------------------------------|-------------------|-----------------------------|--------------|--------------------------------|--------------------------|------------|--------------------|
| | Number of samples | Total number of enterprises | Sample/total | Minimum no. of employees | Maximum no. of employees | Mean | Standard Deviation |
| Final products | 121 | 4,000 | 3.03% | 3 | 3,500 | 459 | 547 |
| Footwear sole | 4 | 380 | 1.05% | 30 | 1,100 | 570 | 612 |
| Footwear last | 2 | 168 | 1.19% | 10 | 80 | 45 | 49 |
| Leather | 4 | 200 | 2.00% | 8 | 170 | 62 | 74 |
| Accessories & ornamental materials | 7 | 100 | 7.00% | 30 | 200 | 75 | 66 |
| Footwear machinery | 2 | 200 | 1.00% | 90 | 500 | 295 | 290 |
| Total | 140 | 5,048 | 2.77% | 3 | 3,500 | 427 | 531 |

Note: The final footwear products include leather shoes, leisure shoes, safety footwear, children's shoes, etc. The number of enterprises reflects the situation at the end of 2004.

Source: Authors' field survey.

3. OVERCOMING TECHNICAL CONSTRAINTS

One of the major obstacles facing the small and medium rural enterprises in developing countries is that they often have difficulties in obtaining appropriate technologies. Caniëls and Romijn (2003) suggested that clustering helps existing firms to accumulate technological capabilities. The results of our present survey indicate that clustering may also help lower the technical barriers for the entry of newcomers. In the late 1970s when China started its reform, the average education level in Wenzhou was very low, and many entrepreneurs lacked sophisticated shoemaking knowledge. When clustering allowed the integral production process to be divided into small steps, however, the barriers for entry were lowered enough for many people to enter the production process.

3.1 Features of the Entrepreneurs

Table 2 displays the number of sample enterprises, the average years of schooling and *Chuangdang* of the founders, and their previous occupational backgrounds prior to entry into the footwear industry, divided by the year in which each business was started. This Chinese term “*chuangdang*” refers to the experience of working away from home, such as joining armies and doing a trade elsewhere. After leaving school, Wenzhou people tended to work or learn trades all across the country. These experiences became an asset, as they learned to obtain and use precious market information.

Several interesting facts emerge from Table 2. Most of the entrepreneurs started their business after 1980; since then, the number of newcomers in the Wenzhou shoemaking industry has remained fairly stable. The average years of schooling received by business founders increased steadily over time, similar to the findings by Sonobe, Hu and Otsuka (2004) on Wenzhou’s low-voltage electric appliance cluster. However, at the early stage of the cluster, outside work experience is even more important than a formal education. Before setting up their own footwear enterprises, most of the entrepreneurs had worked elsewhere for many years and accumulated valuable experience. Through working elsewhere or in other trades, the founders accumulated the human and social capital required for setting up their own businesses. More importantly, they were exposed to market information, and thus tended to grasp emerging market opportunities more quickly.

Although Sonobe, Hu and Otsuka (2002) found that most founders in the garment cluster of Zhejiang Province were former farmers, farming was the least prevalent profession among all the founder backgrounds identified in our survey. This may be due to the technological differences in the garment and footwear industries. In the early development period, the footwear industry lacked a specialized division of labor and coordination. Most family workshops produced whole shoes, requiring a high command of various techniques. As seen from Table 2, the proportion of newcomers with shoemaking experience has

remained relatively high, indicating the existence of technical barriers for newcomers. The participants were often ex-employees of state- or collectively-owned shoemaking enterprises in which shoes were manually produced using small machines. Thus, shoemaking “know-how” was critical for entrepreneurs to enter the business and the industry was dominated by skilled workers because technology barriers prohibited unskilled individuals (such as farmers) from entry. This point is supported by the high ratio of founders who reported having worked in shoemaking factories in the early 1980s.

Table 2: Characteristics of Entrepreneurs at the Time of Starting Their Firms

| | 1980 and before | 1981- 1985 | 1986-1990 | 1991-1995 | 1996- 2000 | 2001- 2005 |
|---|--------------------|---------------|-----------|-----------|---------------|---------------|
| <i>No. of enterprises</i> | 4 | 18 | 27 | 31 | 38 | 22 |
| <i>Years of schooling</i> | 6.25 | 7.97 | 8.02 | 9.03 | 9.70 | 9.18 |
| <i>Years of Chuangdang</i> | 5.00 | 7.38 | 8.50 | 9.68 | 11.16 | 14.53 |
| <i>Occupation %</i> | | | | | | |
| Farmers | 0.00 | 11.11 | 18.52 | 16.13 | 13.16 | 13.64 |
| Factory workers | 50.00 | 27.78 | 37.04 | 29.03 | 13.16 | 9.09 |
| Marketing specialists | 25.00 | 33.33 | 25.92 | 35.48 | 50.00 | 54.54 |
| Engineers, managers and others | 25.00 | 27.78 | 18.52 | 19.36 | 23.68 | 22.73 |
| <i>Proportion of entrepreneurs with experience in the footwear industry %</i> | | | | | | |
| Related to footwear Industry | 75.00 | 77.78 | 22.22 | 48.39 | 42.11 | 59.09 |

Note: The top row indicates the year of firm establishment. Years of schooling and years of *Chuangdang* are the averages of each respective group.

Source: Based upon the data from authors' field survey in Wenzhou.

Notably, however, the ratio of founders having prior shoemaking experience has declined over time, while the proportion of marketing specialists has risen steadily from an initially low proportion. These findings are similar to those of Sonobe, Hu and Otsuka (2004) in the low-voltage electric appliance industry. With the formation of clusters, the shoemaking industry has become increasingly specialized and the technology barrier has gradually weakened. With the rapid increase in supply in the 1980s, the market underwent a fundamental change from the demand to supply side. As the market matured, marketing skills become more crucial, and individuals with marketing skills began to enjoy a comparative advantage in the emerging competitive environment. This may explain the increasing proportion of salespeople who joined the industry in the later period.

3.2 The Diffusion of Footwear Technology

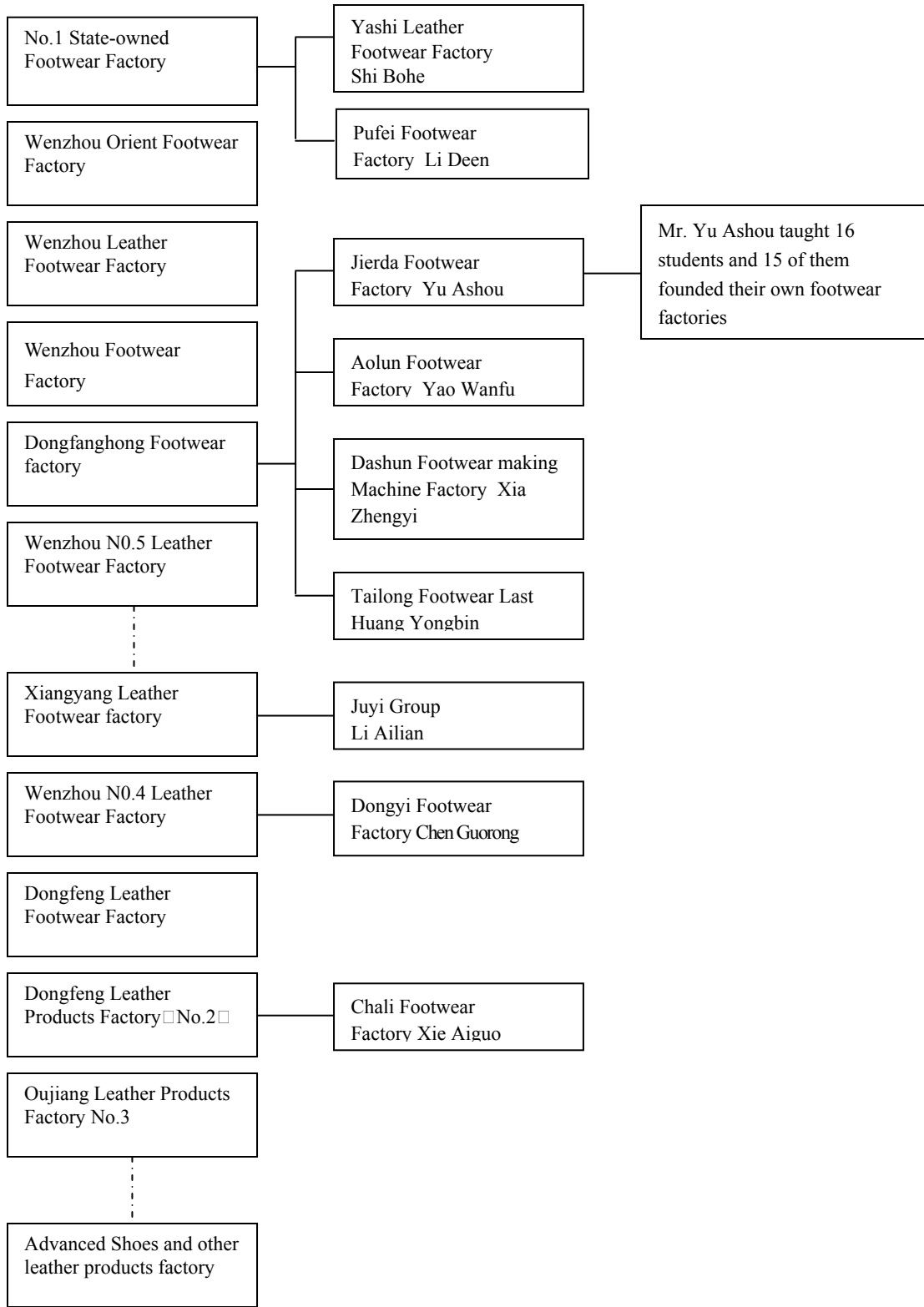
At the turn of the 1980s, when China started its transition from a command economy to a market economy, footwear products were in seriously short supply. This strong market demand prompted many employees of state or collectively-owned footwear factories, especially technicians, to set up their own footwear stalls or family workshops and produce whole shoes by themselves. Due to the highly technological requirements for whole-shoe production, most of the early newcomers to the industry were former technicians from the state or collective firms.

Figure 3 graphs the diffusion process of production technology since the late 1970s. A good example of technical diffusion may be seen in the state-owned Dongfanghong Leather Footwear Factory, which gave rise to three major enterprises, namely Jierda Footwear Co., LTD., China Aolun Shoes Co., LTD., and Wenzhou Dashun Footwear Machinery Manufacture Co., LTD., as well as many smaller enterprises, such as the Tailong Footwear Last Factory. Table 3 displays the backgrounds of the founders of these four enterprises, who were all associated with the state-owned Dongfanghong Leather Footwear Factory.

Having the experience of apprenticeship was found to be a major asset in setting up shoemaking businesses. The most prominent example of this is Mr. Yu Ashou, the founder of Jierda Footwear Co., LTD. As shown in Figure 3, he had 16 apprentices, 15 of whom set up their own companies, while the last one became his son-in-law and worked in Jierda Footwear Co., LTD. (Yuan, 2003).

Copying and spin-offs further increased footwear production and the rate of technological diffusion. Aokang and Hongqingting are two typical examples of spin-offs. Wang Zhentao and Qian Jinbo first worked as carpenters and later sold shoes together until 1988, when they co-founded a leather shoe factory. In 1995, the factory split into the Aokang Group and the Hongqingting Group, which still exist today. After the split, both groups grew into leading footwear companies. The formation of an industrial cluster is a process of production and technological diffusion through copying of others. Success of one enterprise often lures others to imitate, resulting in numerous enterprises being duplicated. As far as Wenzhou's diffusion channels are concerned, this process was accomplished primarily through relatives and friends (Zhu, 2005).

Figure 3. Diffusion of Footwear Production Techniques and Knowledge in Wenzhou



Source: Authors' field survey.

Table 3: Backgrounds of the Founders of Four Enterprises Derived From the Dongfanghong Shoemaking Factory

| Name of Enterprise | Founders | Positions in Dongfanghong before setting up enterprises |
|---|-----------------|--|
| Jierda Footwear Co., LTD. | Yu Ashou | Head of workshop |
| China Aolun shoes Co., LTD. | Yao Wanfu | In charge of production |
| Wenzhou Dashun Footwear Machinery Manufacture Co., LTD. | Xia Zhengyi | In charge of machine repair |
| Tailong Footwear Last Factory | Huang Yongbin | Senior technician |

Source: Authors' field survey.

In summary, the shoemaking technologies were available in Wenzhou prior to reform, but were quickly disseminated after reform. This then leads to the next question: why has the footwear industry in Wenzhou grown much faster than in many other places where shoemaking technologies were equally available prior to reform?

3.3 Division of Labor Lowers Technical Constraints

Here, we argue that clustering deepens the division of labor in the production process and makes it possible for small entrepreneurial firms to enter the industry by focusing on a narrowly defined stage of production. In the clusters, the spin-offs of the old firms did not only duplicate the existing technologies, they engineered many innovations in the production process. While it is generally recognized that division of labor can improve production efficiency (Smith, 2003), its role in breaking the barriers to entry has largely been neglected. Our study shows that clustering has simplified complex production processes into small steps which not only lowered technical and capital barriers to entry but also took full advantage of a wide range of entrepreneurial talents scattered in rural areas.

First, the division of labor initially decomposes complicated footwear products into numerous intermediary products, thereby enabling many entrepreneurs without shoemaking backgrounds to participate. Table 4 lists seven categories and over 20 varieties of intermediary products in the footwear cluster. From the list, newcomers can choose appropriate products according to their technological capacity.

Table 4: Intermediary Products of Shoes

| Assortments | Intermediary products |
|--------------------------------------|---|
| Upper of footwear | Leather, PV leather, PVC leather, etc. |
| Sole of footwear | Outsole, mid-sole, insole, heel, sock lining, heel pad, etc. |
| Lining of footwear | Fore-lining, back-lining, sponge, cloth material, foam, etc. |
| Materials of footwear | Filament, cement (rubber cement, neoprene), crepe, etc. |
| Matching products | Last, footwear horn, cotton flannel for footwear-polishing, brush, etc. |
| Accessories and ornamental materials | Footwear buckle, slide fastener, lace, edging, elastic band, etc. |
| Packing materials | Box/carton, brand, tag, label ticket, tissue paper, drying agent, etc. |

Source: Authors' field survey.

Second, for each of the above intermediary product, further divisions of labor were carried out to decompose the production process into smaller steps, remarkably reducing the technical difficulty. Some auxiliary steps in the production process can even accommodate the elderly and disabled. In the rural Yongjia County of Wenzhou, we found that some women used simple tools to assemble small metal components like shoe accessories and buckles during the slack farming season. Schmitz and Nadvi (p. 1503, 1999) pointed out that “clustering is particularly relevant for the early stage by helping small enterprises to grow in riskable steps.” Our case study provides support for their argument.

Finally, division of labor can also make better use of the talents of entrepreneurs. More competent entrepreneurs can accommodate more production steps into a firm or organize them within an effective vertical integration, whereas less competent entrepreneurs may only work on one or a few steps at the appropriate scale. Therefore, division of labor could adequately tap the potentials of a wide range of rural entrepreneurs that are abundant in villages and townships in Wenzhou. This point is in consistent with the observation by Hayami, Kikuchi and Marciano (1998) on metal craft industry in the Philippines.

4. OVERCOMING CAPITAL CONSTRAINTS

4.1 The Constraints of Start-up Capital Investments

Lack of access to adequate start-up capital has been recognized as an important deterrent to the growth of small and medium enterprises (SMEs) in developing countries (Otero and Rhyne, 1994; Pretes, 2002; Schreiner and Woller, 2003; Hernández-Trillo, Pagán, and Paxton, 2005). This is because banks are generally cautious in providing SMEs with loans for start-up capital. Among the 140 enterprises we surveyed, only two had received bank loans in their incipient stage: one was founded in 1996 with an investment of 500,000 *yuan*, including a 40% bank loan; the other was founded in 2000 with an investment of 500,000 *yuan*, receiving a 20% bank loan. Table 5 details the sources of the start-up capital for all surveyed enterprises. Over two-thirds of the start-up capital came from individual investments, 24.94% from relatives and friends of the founders, 8.35% from the public or other resources, and only a negligible 0.34% from banks. Among the 118 enterprises with complete answers, only six had raised funds from public sources, accounting for 20%-67% of their initial investments. In summary, Wenzhou shoemakers mainly relied on funds obtained from themselves, relatives and friends for start-up capital instead of formal financing.

Table 5: Sources of Start-up Funds

| | Founder | Direct relatives | Indirect relatives or friends | Banks | Public funds | Others | Total start-up fund |
|-----------------------------|----------|------------------|-------------------------------|-------|--------------|--------|---------------------|
| Average amount (1,000 yuan) | 1,307.48 | 287.00 | 204.40 | 6.79 | 43.58 | 120.86 | 1,970.11 |
| Percentage (%) | 66.37 | 14.57 | 10.37 | 0.34 | 2.21 | 6.14 | 100.00 |

Note: Each initial investment value is deflated by the price index of fixed capital investment of Zhejiang province, which was obtained from the Zhejiang Statistics Yearbook and China Statistics Yearbook.

Source: Calculated from authors' field survey data.

With such limited access to formal financing, how did the SMEs in Wenzhou overcome capital constraints? One strand of the literature (Allen, Qian, and Qian, 2005) argues that informal financing matters more to industrial growth than formal financing. However, informal financing alone may not be sufficient to explain how the SMEs in Wenzhou overcame capital constraints, because informal financing was available at similar levels in other places that did not experience such active growth, such as Henan

and Fujian Provinces (Tsai, 2002). Thus, there must be other factors at work. In this paper, we stress the importance of clustering in lowering the capital barriers to entry.⁸

Clustering effectively decomposed the shoemaking process into many small steps, which required much lower levels of fixed investments. Under this model, different entrepreneurs could choose different production types based on their financial resources and risk tolerance. Table 6 lists the investments required to start footwear-related businesses during different periods. The surveyed enterprises differed significantly in terms of start-up capital, ranging from 500 to 3,567,400 *yuan*, reflecting different production modes and investment timing.⁹ The minimum, maximum and average amounts of start-up investment have increased over time. Although the threshold of start-up capital has risen on average, the minimum investment remains relatively low, indicating that many entrepreneurs should still be able to afford to enter the shoemaking business.

Table 6: The Amount of Start-up Funds during Different Periods (1000 *yuan*)

| Years | Number | Minimum | Maximum | Mean | Std. Deviation |
|------------|--------|---------|---------|-------|----------------|
| Up to 1980 | 4 | 0.5 | 70.7 | 20.9 | 33.5 |
| 1981-1985 | 14 | 0.9 | 225.3 | 35.0 | 61.1 |
| 1986-1990 | 25 | 2.5 | 312.7 | 66.1 | 91.7 |
| 1991-1995 | 27 | 0.5 | 272.1 | 64.9 | 72.2 |
| 1996-2000 | 32 | 11.1 | 3,567.4 | 246.2 | 612.7 |
| 2001-2005 | 16 | 8.9 | 3,095.7 | 490.3 | 914.5 |

Note: Among the 140 enterprises we surveyed, 20 of the founders or managers failed to respond or give clear answers and 2 were new enterprises. If we deduct these 22 enterprises from the total, 118 enterprises remain. All initial investment values were revised based on the price index of fixed capital investment of Zhejiang province, which was obtained from the Zhejiang Statistics Yearbook and the China Statistics Yearbook (2006). Among the enterprises founded during 1996-2000, two had start-up funds of 3,567,400 and 3,095,700 *yuan* respectively. If these two enterprises are excluded from our calculation, then the average start-up funds of the two periods are only 139,000 and 160,700 *yuan* respectively.

Source: Calculated from data collected by authors.

Having looked at the start-up capital, we next analyze how these enterprises have overcome the constraints of working capital. Table 7 provides the prevalence of different channels adopted by the enterprises when in need of working capital. Our survey found that 44% of the enterprises preferred to borrow from indirect relatives and friends, followed by banks (20%), then from direct relatives (11%). Very few chose to raise funds publicly. This led us to question why firms depended less on direct

⁸ Ruan, Wei, and Zhang (2006) discuss in detail how clustering helps lower the barriers to entry based on a case study on the Puyan cashmere sweater industrial cluster in Zhejiang Province.

⁹ The Kangnai Group had an initial investment capital of only 500 *yuan* when it was founded in 1980, and went on to become one of the biggest shoemakers in China. This group owns 14 advanced automatic production lines, and its output reached 1.2 billion *yuan* in 2004.

relatives when raising funds for working capital versus start-up capital. Further analysis showed that funds raised from direct relatives tended not to bear interest or have definite payment deadlines. Since the borrowers could use these funds for relatively long periods without penalty, they most often spent the monies for start-up capital.

Table 7: Preferred Channels to Raise Working Capital

| Preferred channel | Direct relatives | Relatives or friends | Banks | Public fund | Others | No financial difficulty | Total |
|-----------------------|------------------|----------------------|-------|-------------|--------|-------------------------|--------|
| Number of enterprises | 15 | 62 | 28 | 4 | 16 | 15 | 140 |
| Percentage□%□ | 10.71 | 44.29 | 20.00 | 2.86 | 11.43 | 10.71 | 100.00 |

Source: Based upon authors' field survey.

Another common practice is the use of trade credits from upstream enterprises to ease working capital constraints. Members of the footwear clusters are located in close proximity to one another, leading to repeated business transactions and the formation of a certain level of trust among the upstream and downstream firms in the production chain. These entities, which are engaged in the same chain of production and well aware of each other's credit histories, form a multilateral default penalty mechanism. As shown in Table 8, we examined whether the surveyed enterprises purchased goods based on credits provided by upstream enterprises. Our results revealed that most of the investigated enterprises receive credits with a term of no longer than three months. Trade credits are an important channel by which Wenzhou shoemakers mitigate their working capital constraints. Usually, the upstream firms are big and can easily obtain loans from state banks. Meanwhile, banks are more willing to lend to established enterprises capable of mortgaging their fixed assets. Therefore, bank loans are often more readily available to firms for use as working capital versus start-up capital.

Table 8: The Patterns of Trade Credits from Upstream Suppliers

| | Credit allowed□credit period□ | | | | | Not allowed | No definite answer | Total |
|-----------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------|-------------|--------------------|--------|
| | 1 month or less | 1-2 months□including 2 months□ | 2-3 months□including 3 months□ | 3-6 months□including 6 months□ | Over 6 months | | | |
| Number of enterprises | 78 | 17 | 17 | 7 | 2 | 12 | 7 | 140 |
| Percentage□%□ | 55.72 | 12.14 | 12.14 | 5.00 | 1.43 | 8.57 | 5.00 | 100.00 |

Source: Calculated from authors' field survey.

5. BREAKING INSTITUTIONAL CONSTRAINTS

In addition to the technical and economic constraints, a series of institutional constraints have typically limited the formation of clusters. Thus, the formation of the Wenzhou footwear cluster was also a process of deepening reform. At the beginning, the founders of the Wenzhou shoemaking enterprises faced two institutional constraints: ownership risk and contract risk.

5.1 Avoiding ownership risk

At the beginning of reform, China had no market economy system in place. As a result, private property rights were still constrained by ideology. Private economic activities in this period were often branded as “illegal market activities” and were suppressed by the government. This meant that entrepreneurs faced questions regarding how to circumvent ownership risk and obtain individual economic liberty. In order to avoid direct conflicts with the legal system and ideology, and to reduce the high transaction costs caused by branding, many private enterprises resorted to some makeshift practices such as attaching themselves to a legal enterprise or organization to avoid ownership risk.¹⁰ Through these practices, they not only managed to legalize their private enterprises, but also gained access to formal financing. The role of local governments was not negligible in this process, as their acquiescence and even support for these private innovations enabled Wenzhou shoemakers to break through the institutional constraints and circumvent the crucial ownership risk (Zhang and Li, 1990).

5.2 Reducing Contract Performance Risk

A deepening division of labor creates a higher coordination cost among different parties involved in the transaction (Becker and Murphy, 1992). The efficient functioning of markets requires good contract enforcement. To be credible, the organization that enforces contracts must have the power to force people to adhere to its decisions (North, 1990). However, given that the Chinese legal system is incomplete and a credit system has not yet been established, the cost of enforcing contracts by legal means, such as through a court case, is very high. Since litigation costs often exceed the value of the transaction, it is often not economical to rely only on formal contracts. Thus, social trust is often used to help enforce contracts and reduce transaction costs. In our survey, we examined how enterprises in the Wenzhou footwear cluster generally resolved contract conflicts. Table 9 presents the results of this analysis.

¹⁰ Those that become affiliated with public enterprises were called “hang-on household enterprises” (or “guahu qiye”), since they attached themselves to state-owned enterprises by paying to use their name, stationery, receipts, and account numbers. Those that chose to register as collectives with neighborhood or village committees were said to “wear a red hat” (Tsai, 2002).

Table 9: Conflict Resolution Modes between Enterprises

| <i>Solutions</i> | <i>Court case</i> | <i>Mediation through related associations</i> | <i>Out-of-court settlement</i> | <i>Others</i> | <i>No response</i> | <i>Total</i> |
|-------------------------|-------------------|---|--------------------------------|---------------|--------------------|--------------|
| Number of enterprises | 4 | 9 | 94 | 7 | 26 | 140 |
| Percentage □ % □ | 2.86 | 6.43 | 67.14 | 5.00 | 18.57 | 100.00 |

Source: Calculated according to the data collected by authors' field survey.

Among the 140 enterprises in the sample, 94 explicitly expressed that they resolved contractual conflicts through out-of-court negotiation, whereas only four reported going to court. Due to the incomplete legal system, going to court costs both money and energy, and even if a party wins a lawsuit, the winner may not be able to receive the full compensation. Consequently, negotiation out-of-court has become a popular substitute for formal contracts.

In addition to social trust, the cluster also relies on market forces to reduce the transaction cost. Wenzhou created various specialized markets, such as the Footwear Accessories and Ornamental Materials Market, the Original Leather Market, the Leather and Footwear Machine Market, and the Leather Chemical Market, to facilitate concentrated transactions. Sonobe, Hu and Otsuka (2002) argued that the local marketplace, where enterprises can easily purchase materials and sell products to local traders, plays a critical role in easing the entry of new enterprises. With the pressure of easy entry, specialized markets maintain disciplines on transaction partners and consequently reduce the risk of transaction failure. As more potential transaction partners enter a given market, each transaction becomes more replaceable, causing competitors to increase transaction efficiency.

The presence of various specialized markets of intermediate goods also helps reduce the holdup problem often discussed in the firm literature. Hold-up problem describe a situation where one party (such as a manufacture) refrains from establishing an agreement with another party (such as a supplier) due to concerns that it may give the other party increased bargaining power, and thereby reduce their own profits. Modern transaction economics (Williamson, 1985) reckons that one key reason for the existence of a firm is to avoid the holdup problem among the chain of production in the presence of frequency, uncertainty, and asset specificity (forgone economic benefits of discontinuing a relationship). With specialized markets for major supplies of shoe production nearby, a firm can easily buy all the necessary materials from the market and does not need to worry about being held up by a big supplier. Likewise, clustering the production of both final and intermediary goods allows a firm to choose among multiple suppliers at any production stage, once again reducing the likelihood of holdup. This makes the traditional large firms with vertical integration less desirable in the Wenzhou footwear cluster, opening more opportunities for small and median enterprises.

6. LESSONS FROM THIS CASE

China's rapid industrial growth has received wide attention in the literature (Allen, Qian, and Qian, 2005). As the most dynamic private economy in China, Wenzhou provides an opportunity for us to examine the driving forces behind China's fast rural industrialization. Several lessons can be drawn from the results of our survey.

First, the formation of the footwear cluster was, to a large extent, path-dependent. Because footwear production was a major industry in Wenzhou prior to reform, shoemaking technology was readily diffused when the market demand for shoes suddenly emerged after the success of rural reform. The existence of the state and collectively-owned footwear factories in the planned economy era made it possible for the footwear cluster to blossom in Wenzhou.

Second, challenges beget opportunities. Facing adverse living and production conditions, many natives of Wenzhou fled. However, although the disadvantageous environment restricted economic development, it also created opportunities. After China's opening and reform, Wenzhou's entrepreneurs observed the dramatic rise in demand and effectively seized the opportunity to massively produce shoes. The adverse natural and infrastructure conditions also helped forge a unique regional social culture in Wenzhou, promoting entrepreneurship, risk-taking, hard working, and the value of friendships. These factors played a significant role in maintaining the functioning of clusters through contract enforcement and informal financing. The establishment of the "Wenzhou Model" is, in a sense, the result of individuals being cornered by disadvantageous factors and finding a way to turn them into advantages.

Third, the capital and technical constraints for rural industrialization in developing countries may be less serious than that generally suggested in the literature (Ayyagari et. al., 2006). When facing the constraints of technology and credit, traditional thinking emphasizes the removal of these limiting factors. Along this line of thinking, for example, micro credits have been widely promoted in many developing countries. The experience from the footwear cluster in Wenzhou, however, illustrates that the credit constraints facing many SMEs may have induced the deepening division of labor and promoted rural industrialization. Clustering lowers both the technical and capital barriers to entry and enables a wide range of rural talents to become involved in the production process. The high coordination cost as a result of increasing division of labor in the cluster has been largely overcome by the strong social capital inherent in the rural community in Wenzhou. Thus, while functional financial systems are important to economic development, they may not constitute a necessary precondition for rural industrialization.

To conclude, economic development itself is a process of continuously confronting limiting factors and identifying solutions. Innovations, both in terms of institutions and technology, are the driving

forces behind the phenomenon of the “Wenzhou Model.” Because the “Wenzhou Model” has been widely accepted and highly recognized in China, the formation and evolution of the Wenzhou shoemaker cluster is not only significant in itself, but also as a means to understand and interpret the development of China’s economy and institutional transformation.

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