

**Emerging Third Stage
Peri-Urbanization: Functional
Specialization in the Hangzhou
Peri-Urban Region**

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1. Introduction

Background

Hangzhou Municipality is the provincial capital of Zhejiang, on China's east coast. It forms part of the Yangtze River Delta (YRD) region. Hangzhou was "opened up" in the mid-1980s, following Deng Xiaoping's visit to the South, resulting in an almost immediate flood of foreign and domestic investment in manufacturing.¹ This initial investment was significantly in the peri-urban areas, i.e., outside the built-up area.² The authors have been following development in the Hangzhou extended urban region, with emphasis on peri-urbanization processes, since 2000.³ A previous APARC discussion paper describes findings of preliminary field research on the Hangzhou–Ningbo Corridor, conducted in August 2000 and March 2001.⁴ The present paper zooms in on two peri-urban clusters in the Hangzhou extended urban region, and assesses their development over time. The goal of the research is to better understand how a peri-urban region changes—particularly in terms of firm evolution, labor characteristics, and spatial dynamics—as it becomes more economically and demographically mature. This paper also examines such changes in the context of the increasing cost structures and emerging competitors, primarily from other areas in China, that the Hangzhou peri-urban region now faces.

Objectives and Themes

Manufacturing based peri-urbanization has been underway in the Hangzhou vicinity for approximately twenty years. In fact, Stage I peri-urbanization, based on Township and Village Enterprises (TVEs), started even earlier. The people of Zhejiang Province have long been known for their entrepreneurial spirit, and they were among the first to take advantage of policies that allowed establishment of TVEs. As has been argued elsewhere,⁵ in relative terms (i.e., percentage of total TVE output or employment) TVEs were largely a coastal peri-urban phenomenon. The interior and western areas were relatively more dependent on State Owned Enterprise (SOE) development.⁶ Stage II peri-urbanization, as described in the previous Hangzhou–Ningbo discussion paper, was focused to a significant extent on large-scale Economic and Technology Development Zones (ETDZs) and high-tech parks, and was also significantly associated with Foreign Direct Investment (FDI). In the YRD case, labor was largely procured in situ. Surplus agricultural labor living in the densely populated hinterland of coastal cities moved into manufacturing (and induced services), often staying put residentially or moving only short distances. Stage II peri-urbanization attracted first-generation migrants, but to a much lesser extent than in the Pearl River Delta (PRD) Region, which has attracted approximately fifteen million inter-provincial rural-urban migrants to date.

During Stage II, competition from other regions of China for manufacturing investment was relatively subdued. This was true of coastal competition—the pie was so large that there was enough investment for all, including noncoastal competition. Furthermore, there were significant differences in coastal specializations, based on differing regional development “styles.” The interior regions had not moved much beyond SOE-driven development, and so were not yet experiencing consequential FDI-driven growth or bottom-up, entrepreneur-driven, cluster-oriented economic growth. Stage II peri-urbanization was also characterized by spatial clustering of research and development (R&D), production, and management functions within firms, which was reflected in a relatively unspecialized peri-urban economic geography in the Hangzhou area. Until relatively recently, the high level of internalization of producer services within firms, even in the private sector, reinforced the latter pattern.

This discussion paper focuses on the implications of a changing environment for manufacturing-driven peri-urbanization in the Hangzhou Region, which is characterized by the following:

- (i) Emergence of competitor noncoastal regions exhibiting much lower cost structures (for land, utilities, buildings, and to a somewhat lesser extent, labor). The leading example of such a region would be the Chengdu–Chongqing Corridor, the fourth largest urban cluster in China.⁷
- (ii) Increasing pressure by both domestic and international purchasers to obtain intermediate and finished goods at lower prices (frequently creating deflationary dynamics), often while simultaneously demanding higher quality. For example, large international purchasers such as Wal-Mart are increasingly buying directly from Chinese coastal manufacturers, eliminating the “middle man,” and demanding high quality goods at very low prices.⁸
- (iii) An emphasis on design content and customization of products by coastal firms facing the foregoing pressures. This enables coastal firms to move up the value chain, in an attempt to remain competitive.

(iv) Significant decline in the size of the in situ agricultural sector labor pool who are available and willing to work in manufacturing. Much of the young population in the YRD that wishes to work in the manufacturing sector has already made the transition.

(v) The existence of significant numbers of older, first generation migrants in the Hangzhou peri-urban region (and throughout much of the YRD) who have stayed on, and the emergence of second generation migrants, i.e., their children, now teenagers or in their twenties.

(vi) More liberalized *hukou* (household registration) systems, particularly outside the Hangzhou metropolitan *city proper* area.

The primary objectives of this discussion paper are to:

(i) Explore how this changing context is resulting in new economic geographies and the implications for labor, households, and the built environment;

(ii) Generalize to the extent possible the issues and dynamics that concern emerging Stage III peri-urbanization;⁹

(iii) Put forward policy implications.

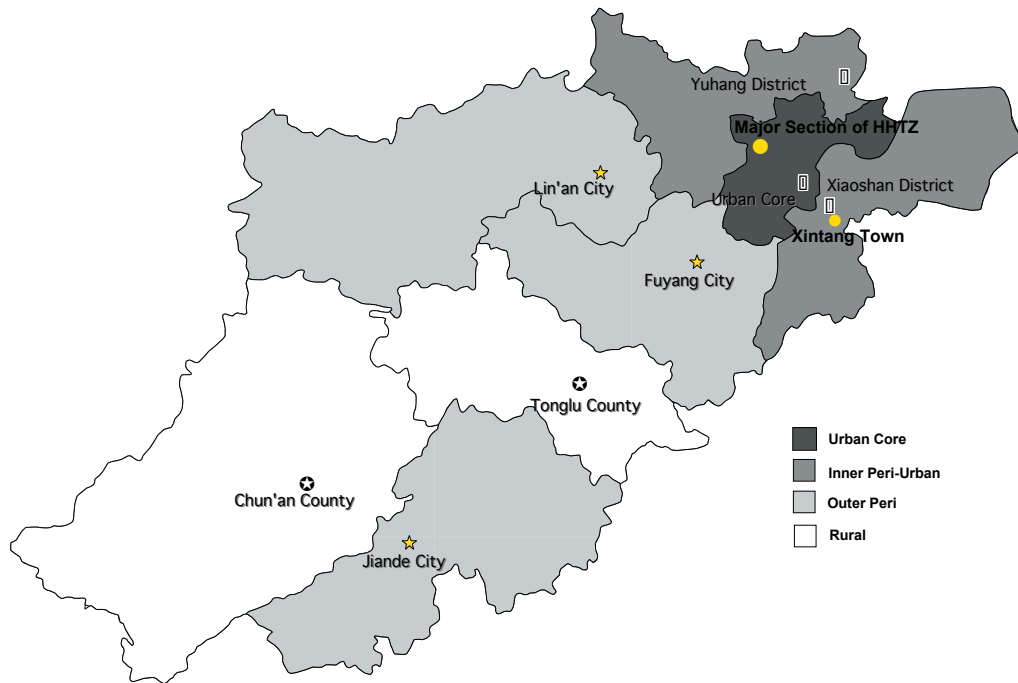
We are particularly interested in the extent to which peri-urban clusters or activities are being spatially spun off from the Hangzhou peri-urban region; how peri-urban clusters are moving up the value chain; how the labor mix is changing; and whether the geography of production (manufacturing, R&D, producer services, management) is becoming more spatially specialized and/or separated. In sum, we explore the adaptation behavior of firms, labor, and communities in a mature peri-urban region that is increasingly under pressure from other competitive regions, changes in buyer behavior, and rapid changes in market preferences of buyers and end consumers.

A secondary objective of the research project is to compare emerging peri-urban dynamics in the Hangzhou Region with a western China peri-urban region—the Chengdu peri-urban region—the subject of a companion discussion paper.¹⁰ Much of this comparative analysis is found in the discussion paper on peri-urbanization in the Chengdu peri-urban region.

2. Methodology

The methodology is micro in focus, complementing earlier, more macro work. The study region is Hangzhou Municipality. Its counties and districts have been classified into four settlement types: urban core, inner peri-urban, outer peri-urban, and rural areas, as described in Map 1. Limitations of secondary data, and the nature of the paper's objectives, which requires knowledge of intra-firm dynamics, make a micro-, firm-, and employee-based research approach necessary and appropriate.

Map 1. Hangzhou Municipality



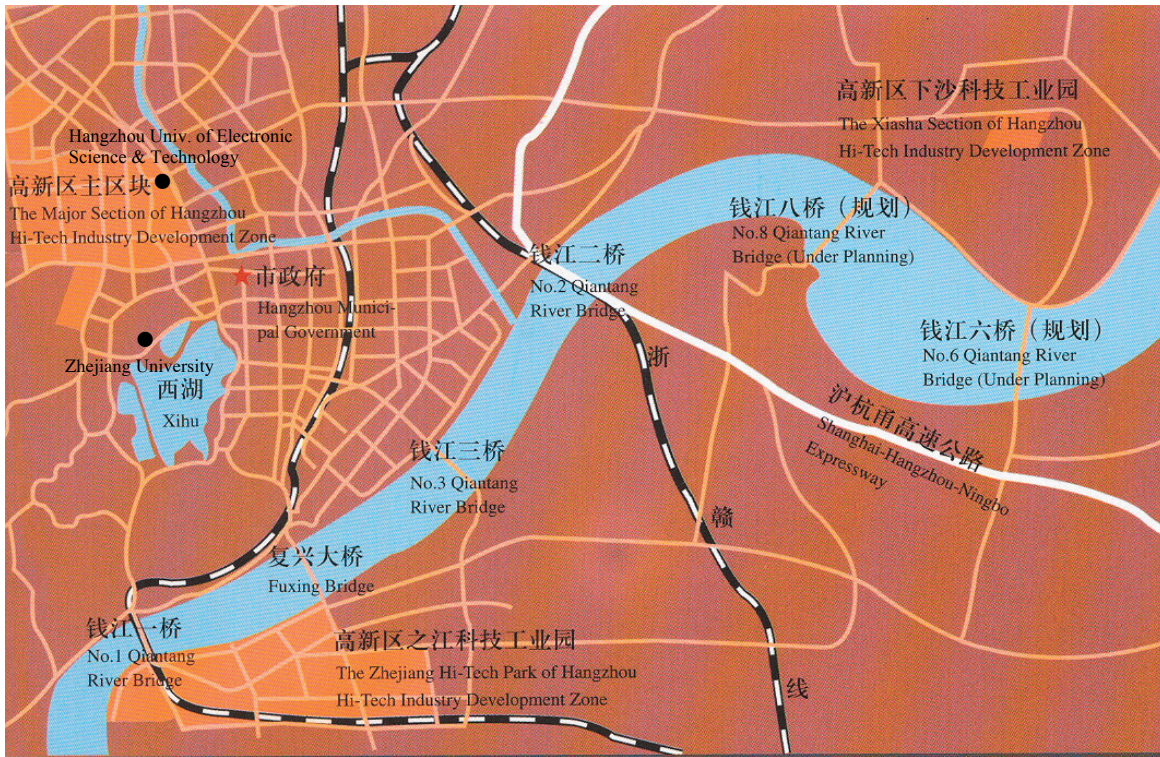
The analysis commenced with rapid assessment of readily available secondary data for the study region as a whole. Key findings from this task are summarized in Section 3. However, the focus of the research was on two economic clusters in the study area. Like much of coastal China, and Zhejiang province in particular, Hangzhou Municipality is known for its many dynamic economic clusters. For example, in Tonglu County, 200 firms produce 2 billion ballpoint pens annually, and Fuyang City has 20–30 firms producing 20–30 percent of the fiber optic cable consumed in China.

For this study, two clusters were chosen, one specializing in the development and manufacture of high-tech electronic instruments, and the other in the production of down products, such as ski jackets and quilts. At the down cluster, in Xiaoshan District, two firms were the focus of detailed assessment; in the high-tech cluster, we examined four firms. Cluster analysis included (i) an interview with firm management, based on a check list, which lasted approximately two hours, (see Appendix 1); (ii) employee questionnaires based on a stratified sample (see Appendix 2); and (iii) a firm operations questionnaire completed by enterprise management (see Appendix 3). Supplementing the firm-based interviews, we held discussions with relevant local government officials in each case. Provincial government officials worked with the research team and provided background information as needed.

Selection of the clusters involved several considerations. First, we attempted to relate the Hangzhou analysis to clusters analyzed in the Chengdu case (women's shoes, tourism, and diversified light manufacturing) in July 2002.¹¹ The high-tech cluster widened the spectrum of cluster types studied, while the down cluster represented a more mature, but otherwise comparable version of a labor-intensive cluster, similar to the shoe cluster in Chengdu. Second, the down cluster was included because we had engaged in a preliminary study of this cluster in March 2001. A third consideration, given the temporal focus of this research, was to include an area that had formerly been a peri-urbanizing area, but had since

been absorbed into the city fabric. Accordingly, we chose firms in the first zone developed in the Hangzhou High-Tech Industry Development Zone (HHTZ). This area, on the northwest edge of Hangzhou City’s built-up area, next to West Lake, is known as the *Major Section*. (see Map 2.) Two additional zones have been developed as part of the HHTZ. *Xiasha Scientific and Technological Garden* is located on the northern bank of Qiantang River, next to the Hangzhou Economic and Technological Development Zone. *Zhejiang Scientific and Technological Garden* lies on the southern bank of Qiantang River, opposite the Six-Harmony Pagoda (see Map 2).

Map 2. High-Tech Cluster



Source of base map: “Hangzhou High-Tech Industry Development Zone” Brochure (n.d.)

The Major Section is typified by electronic instruments industries and the many technical colleges and institutions that support these firms. When the Major Section was developed in the early 1980s it was a typical peri-urban zone: an area of farms, dispersed residential settlement, and pockets of industrial development.¹² By contrast, the down cluster in Xintang Township of Xiaoshan District, considerably further out from Hangzhou City core (about twenty kilometers; see Map 1), is a typical peri-urbanizing environment, with large areas of green/agricultural space interspersed with industrial parks and worker housing.

3. The View from Above: The Hangzhou Peri-Urban Area

3.1 Population Dynamics

In 2000, according to the 5th census, the population of Hangzhou Municipality was 6.8 million. Over the previous ten years, the municipality (which is geographically large, 16,596 km², and contains vast rural areas of rough terrain) grew moderately, adding one million people, for an average annual growth rate of 1.7 percent (see Table 1).¹³ Based on comparison of the 4th and 5th censuses, almost all of the demographic growth occurred in the urban core, which grew at a very rapid average annual rate of 5.2 percent over the ten-year period. The peri-urban areas experienced slow rates of population growth, less than half a percentage annually, while the rural areas lost population. As a result, the core has gained share of the total municipal population. It now accounts for over one-third of the population (35.6 percent), up from a quarter in 1990.¹⁴

These population dynamics are typical of a mature extended urban region, in which manufacturing tends to locate in the peri-urban area and becomes relatively less important in the extended urban region's economy, relative to the service-oriented component of the economy, which is centered in the urban core.

Among the districts and counties in the Hangzhou Municipality, Xiaoshan District (in the inner peri-urban area) is the most populous, with 1.23 million people in 2000. During the 1990s, it added a total of 100,000 people, for an average annual growth rate of 0.87 percent, the highest rate among the noncore districts and counties. The other district that composes the inner peri-urban area is Yuhang. It experienced a negative rate of growth of -0.51 percent over the same period. It is obvious that there is high variance in inner peri-urban demographic growth rates, largely related to the geographic direction of development. In the case of peri-urbanization in the Hangzhou region, development is being driven strongly to the east, along the Hangzhou–Ningbo Corridor, while the northern vector stagnates.

Table 1: Census Population¹⁵

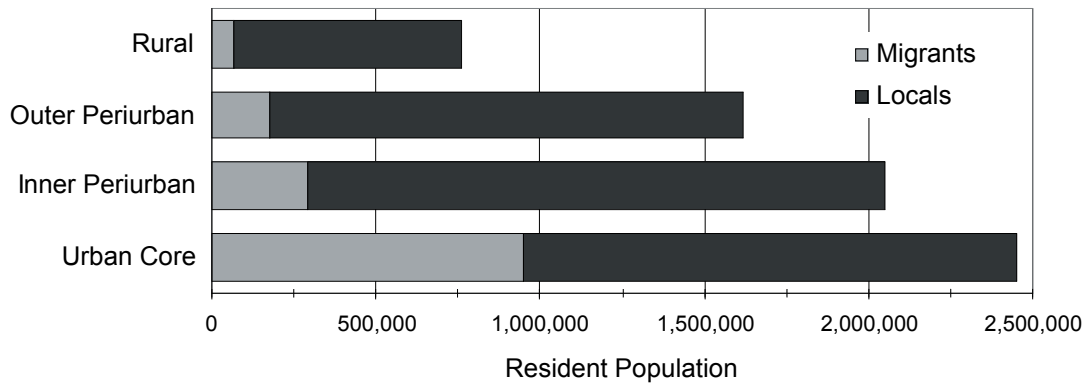
	1990 4 th Census (1,000 persons)	2000 5 th Census (1,000 persons)	Annual Rate of Change (%)	1990 Share of Total Population (%)	2000 Share of Total Population (%)
Urban Core	1,477.2	2,451.3	5.2	25.3	35.6
Inner Peri-urban	1,991.4	2,051.1	0.3	34.1	29.8
Outer Peri-urban	1,552.5	1,615.9	0.4	26.6	23.5
Rural	812.1	760.4	-0.7	13.9	11.1
Municipality	5,832.1	6,878.7	1.7	100.0	100.0

Source: Based on data from the 4th and 5th National Census, 1990 and 2000.

3.2 Migration Dynamics

The best available migration figures are from the 5th census.¹⁶ Over two-thirds of all the migrants to Hangzhou Municipality reside in the urban core, giving the core area the highest percentage of migrants-to-locals (38.8 percent) of all settlement types in the municipality (see Figure 1). The inner peri-urban area has the second highest percentage of migrants. The inner peri-urban area absorbed nearly 300,000 migrants, or 20 percent of total in-migrants, resulting in a migrants-to-locals level of 14 percent. The corresponding figures in the outer peri-urban and rural areas are 11 percent and 9 percent respectively. Unfortunately, equivalent figures from the 4th Census are not available.¹⁷ The 2000 census figures indicate that, of the total resident population in the municipality, 22 percent were migrants (1.48 million out of a total 6.88 million residents).¹⁸

Figure 1. Composition of Resident Population by Settlement Type, Hangzhou Municipality, 2000

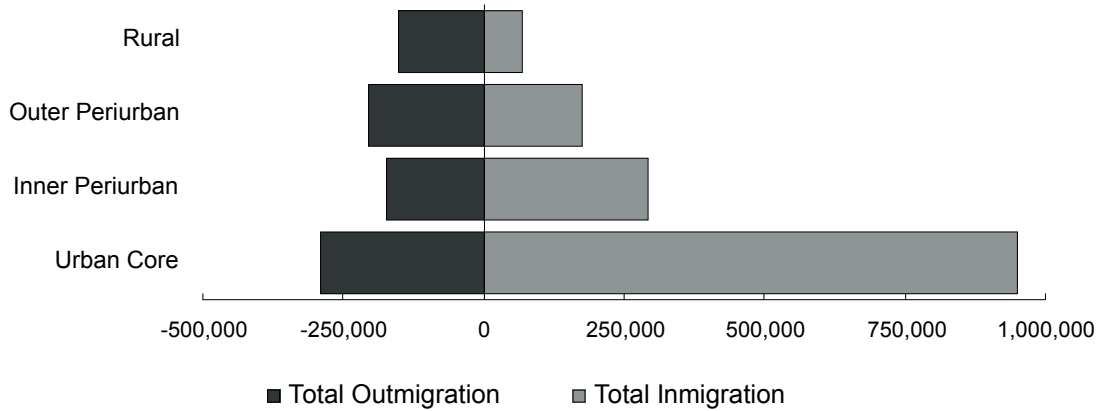


Source: Based on figures in the 5th National Census, 2000.

Because migrants do not locate evenly across the municipality, but rather cluster in a few host towns and cities that offer employment opportunity, especially in the inner peri-urban area, migrants-to-local ratios can be much higher than these figures suggest in highly favored destination localities. For example, in Xintang town in the inner peri-urban district of Xiaoshan (where the down cluster is located), the migrants-to-locals ratio exceeds 1:1. According to local officials, the township's *hukou* population in 2002 was 47,000, whereas the migrant population numbered approximately 50,000.

The municipality has been a net recipient of migrants: 662,629 more people arrived in the municipality than left it in the five years prior to 2000. (Out-migration totaled 821,852.) However net migration dynamics vary greatly by area. As shown in Figure 2, core and inner peri-urban areas have experienced net migration gains, while outer peri-urban and rural areas have experienced a net exodus of people.

Figure 2: In-Migration and Out-migration by Area, 2000



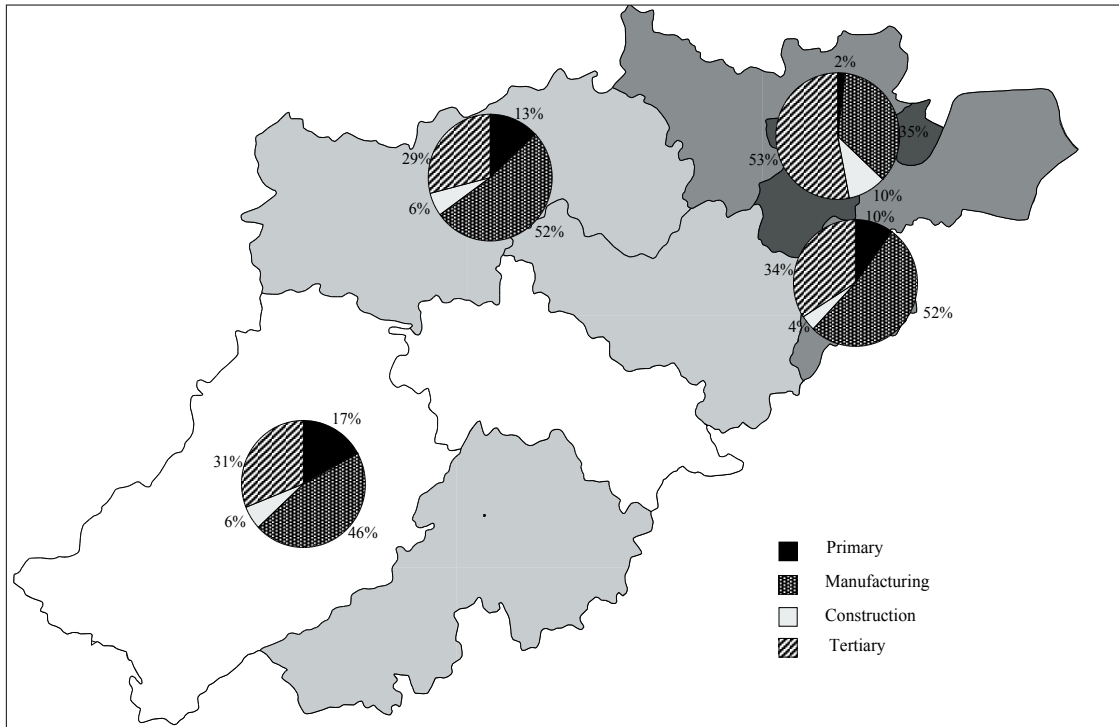
Source: Based on data from the 5th National Census, 2000.

3.3 Economic Structure

The economic structure of the core is quite distinct from the remainder of the municipality, with the core having a much lower share of primary (2 percent) and much higher share of tertiary activity (53 percent) (see Figure 3). Over the past ten years, the share of manufacturing production in the core has been declining, due to the rise of a service-oriented economy that increasingly functions as the government and business service hub for the municipality and the larger province. Yet the level of manufacturing in the core is still relatively high compared to other urban centers in East Asia at similar stages of development. This may result from over-bounding of the city proper and the relative underdevelopment (until recently) of business and producer services in Chinese cities. In addition, manufacturing firms that have moved production out of the core often maintain headquarters in the city, and the value of their production may officially accrue to the core.

As is typically the case in China, economic distinctions among the inner peri-urban, outer peri-urban, and rural areas are not pronounced. The primary sector accounts for an increasing share of the economy as one moves away from the core, but not to the extent anticipated. The rural area has unexpectedly high shares of manufacturing and tertiary activity, compared with other developing East Asian extended urban regions. The three noncore areas have experienced similar dynamics throughout the 1990s. Primary sector shares have fallen across the board. The 1991 shares were 23 percent in the inner peri-urban area, 32 percent in outer peri-urban, and 41 percent in the rural area. In all three noncore areas, the tertiary sector is gaining share, topping out around 30 percent of the GDP of each area. The corresponding 1991 share figures were 18 percent, 20 percent, and 20 percent respectively.

Figure 3. GDP Structure by Settlement Type, based on GDP in 2001



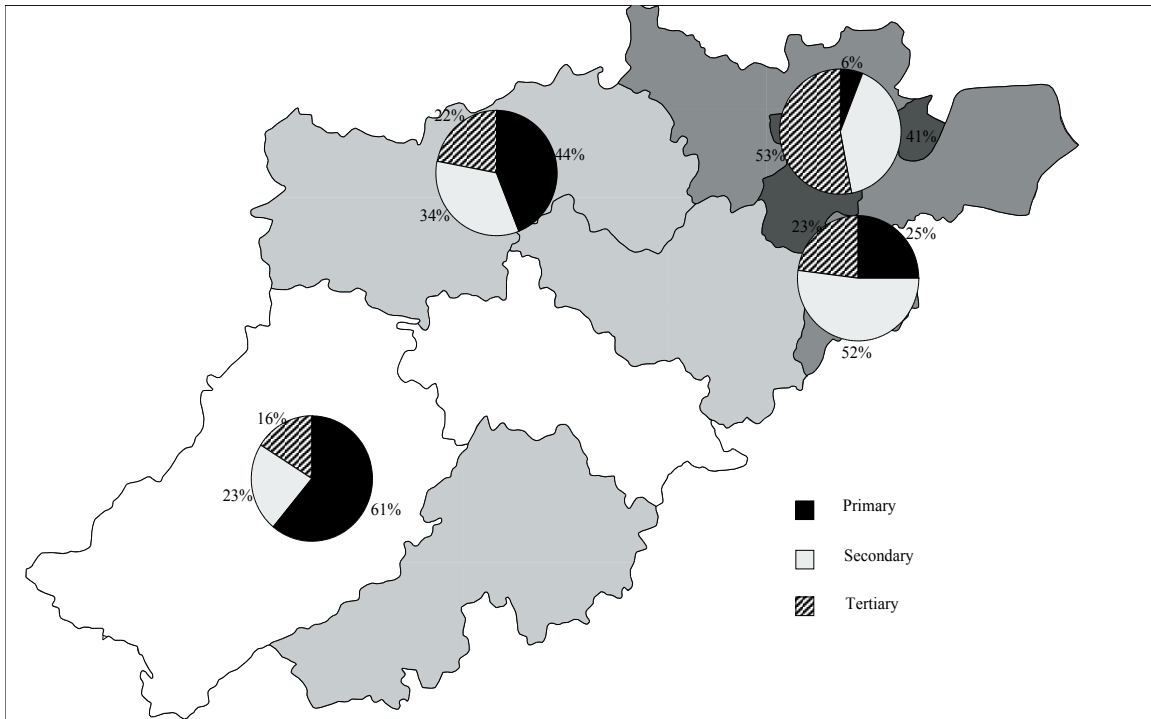
Source: Based on data from the *Hangzhou Statistical Yearbook 2002*.

3.4 Employment Structure

When analyzed in terms of employment structure, the distinctions across the four settlement types may be better understood—and appear much more pronounced—as illustrated by Figure 4. The primary sector is still the leading source of employment in the rural and outer peri-urban area, accounting for over 60 percent of employment in the former, and 44 percent in the latter. The secondary sector still accounts for less than one-quarter of rural employment, but has grown to account for over one-third of all outer peri-urban jobs. By contrast, over half of all employment in the inner peri-urban area is already in the tertiary sector; the other half is almost equally split between the primary and secondary sector. In the urban core, the service sector employs over half the workforce, with most of the remaining employment in secondary activities.

Employment share trends in the four settlement areas parallel those in the economic structure. In all four settlement areas, employment in the primary sector has fallen, while employment in the tertiary sector is on the rise. In 1990, primary employment accounted for over half of all employment in peri-urban areas, and three-quarters of employment in the rural area. Secondary employment share fell in the urban core (it accounted for over half of urban employment in 1990), but rose in noncore areas. The largest secondary employment gains were in the inner peri-urban areas, where the share of employment in secondary activities rose from 37 percent to 52 percent.

Figure 4. Employment Structure by Municipal Area, 2000

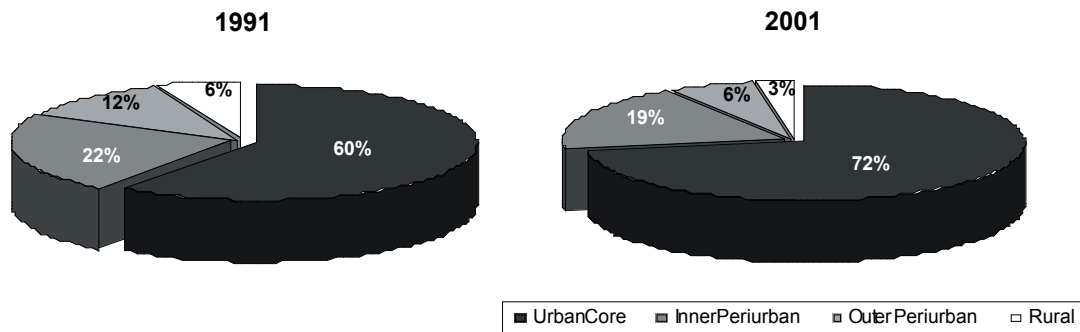


Source: Based on figures from the 5th National Census, 2000.

3.5 Investment in Fixed Assets

As shown in Figure 5, an increasing majority of investment in fixed assets is going to the urban core. Investment in the inner peri-urban area remains strong, particularly in Xiaoshan District, which continues to see robust growth. However, the share of investments in the outer peri-urban and rural areas declined in the latter half of the 1990s. Combined, the urban core and inner peri-urban area accounted for 17.68 billion RMB,¹⁹ or 91 percent of total municipal investment in fixed assets in 2001, with the lion's share of the inner peri-urban investment going to Xiaoshan District.

Figure 5. Total Investment in Fixed Assets by Settlement Type, 1991 and 2001



Source: Based on figures from the *Hangzhou Statistical Yearbook* 1991 and 2002.

3.6 Loss of Cultivated Land

The municipality lost 8 percent of its total cultivated land in the ten-year period between 1991 and 2001, as indicated in Table 2. Most of the loss occurred in the inner peri-urban area, where approximately half of the municipality's total cultivated land is located. Over 10 percent of the cultivated land area in the peri-urban area, or over ten thousand hectares, was lost between 1995 and 2001 alone. The 1991–2001 rate of loss in the inner peri-urban area was 4.78 times faster than its rate of population growth. The municipality's outer regions are also losing cultivated land, although the rate of loss has slowed considerably. A counterintuitive development in the urban core has been a 40 percent increase in cultivated land since 1995, which parallels the growth in value of agricultural production in the urban core, discussed in Section 3.3 above. More investigation is needed to understand this dynamic. Nonetheless, the amount of cultivated land gained in the urban core is very small compared to the losses in the peri-urban area.

Table 2. Cultivated Land

	Amount of land (ha)			Percentage Change (%)		
	1991	1995	2001	1991-95	1995-01	1991-01
Urban Core	9,780	7,820	13,722	-20.0	75.5	40.3
Inner Peri-urban	102,320	98,500	87,727	-3.7	-10.9	-14.3
Outer Peri-urban	61,853	58,870	57,837	-4.8	-1.8	-6.5
Rural	28,113	27,030	26,680	-3.9	-1.3	-5.1
Total Municipality	202,067	192,220	185,966	-4.9	-3.3	-8.0

Source: Based on figures from the *Hangzhou Statistical Yearbook* 1991, 1996, and 2002.

3.7 Inner Peri-urban Dynamics

Situated as it is along the increasingly important Hangzhou–Ningbo Corridor, Xiaoshan District's inner peri-urban development is clearly highly differentiated. Further, Xiaoshan District is growing much faster than Yuhang District, located in the economically and demographically stagnant inner peri-urban area to the north.²⁰ In grouping the two inner periurban districts into a single category, a canceling-out effect results, which understates the vibrancy of Xiaoshan District, and thus of the inner peri-urban area to the east.

Infrastructure construction in support of the Hangzhou–Ningbo Corridor includes an expressway system, a new international airport in Xiaoshan District, and two additional bridges across Qianting River, which divides Xiaoshan from the core of Hangzhou City. The development focus of Hangzhou City is also shifting east, along the Qianting River, at the interface of the core and eastern inner peri-urban area. Thus, while the western part of the inner periurban area (Xiaoshan District) increasingly integrates with the urban core, both physically and economically, the northern area (Yuhang District) is becoming relatively less dynamic.

4. Firm and Cluster Dynamics

4.1 The Major Section, Hangzhou High-Tech Industry Development Zone (HHTZ)

The HHTZ was legally established in March 1990 and its implementation approved in 1991. The Major Section, the site of the High-Tech Study Cluster, was developed earlier under a Science Park Commission; it was merged with the HHTZ when the latter was established. The HHTZ is the only national level High-Tech Zone in Zhejiang Province. It is under the administration of the Provincial and Municipal Government, with the latter playing the lead role. The product of \$525 million (U.S.) in investment, the HHTZ, as a whole, consists of four hundred firms, with total annual sales of 17.54 billion RMB (to March 2001). The Major Section was established to support the electronic instruments industry and to provide sites for educational institutions to cluster geographically in the Hangzhou urban region. It is not an industrial park in the conventional sense. Rather, it is an extensive, mixed-use zone in the northwest of the city, consisting of approximately ten separate sites of four to five multi-story buildings each, interspersed with other uses, such as housing, office, retail, and educational facilities.

When established in the early 1980s, the Major Section was mostly rural. Many of the roads were still dirt, and land prices were low. UNITOP, one of the study firms, occupies a seven-story building that was the first high building in the area, and for several years was considered a landmark in western Hangzhou. Recently, high-rises have sprung up around the HHTZ's development sites, and the area continues to urbanize rapidly.

Most of the firms are engaged in developing and manufacturing what could be called mid-tech products (i.e., middle-level technology), which are appropriate and affordable in the domestic market given China's current level of economic development. These products would be appropriate in many other developing countries, but because of the strength of the domestic market, Chinese firms have pursued these export opportunities only to a limited extent. This large niche market for appropriate technology in China, in the form of electronic instruments drives the science and technology R&D that is occurring in the Major Section. The firms are small and medium-sized enterprises (SMEs), characterized by capital intensive manufacturing processes and a high percentage of spending and staffing on R&D, engineering, and management. All firms are engaged in developing and manufacturing electronic products, but there is wide variation in the specific products developed and produced within this SME bracket.

The following four firms studied typify the range of companies found in the Major Section:

- (i) *The Hangzhou Zhede Hyflux Hualu Membrane Technology Co. Ltd.* was established by professors in the Polymer Division of Zhejiang University. It focuses on water filter membranes of a quality and price suitable for the Chinese market, for filtering piped water and for use in wastewater treatment. Hyflux of Singapore acquired a 55 percent equity stake in the firm in 2001. Hyflux has an international profile, ranked by *Forbes* as one of the two hundred leading SMEs in the world. Hyflux has recently benefited from considerable international media exposure, having developed "pure" water in Singapore—bottled drinking water produced from wastewater. The firm employs seventy people; just over half are production workers.

(ii) *Zhongli Broadcast Technology* develops radio broadcast receiving technology and products. It started in 1992 as a spin-off of the Tian-Yian fiber optic company (as noted, Zhejiang is the site of a major fiber optics manufacturing cluster), focusing on product sales, but later shifted its focus to R&D and production. Its synchronized network broadcasting technology is the basis for new international standards in broadcasting. Its products are sold to over twenty provinces in China, as well as internationally (e.g., Vietnam). The firm employs eighty staff, of which just fifteen are production workers.

(iii) *UNITOP Ltd. Co.* develops and sells mobile transmission equipment for radio and mobile telephone communications. The company started in Hainan Province in 1984 to take advantage of China's Open Door policy. In 1987, the founder opened a branch in Hangzhou, his hometown, and shifted most of the company's investment and activity to the new location. Originally a producer of telephone switching equipment, in 1999 UNITOP began developing new technology to take advantage of market opportunities in the fast growing mobile telephone industry. Among the products it developed is a mobile telecommunications unit, which can be moved wherever a telecommunications company is experiencing congestion on their wireless network, such as at special events. Two of China's three largest telecommunications companies account for approximately 50 percent of its sales. The company employs ninety staff, thirty of whom are involved in R&D, twenty-five in sales, and fifteen in management and administration. Only twenty work in actual production.

(iv) *Xianfeng* (or Pioneer) develops and produces "smart" gas meters for households and industries. The firm began as a distributor of British-made gas meters in 1991, but later developed its own technology to bring costs more in line with what the average Chinese household could afford. Xianfeng's basic household meter costs only 400 RMB compared to 2,400 RMB for a comparable British meter. By 1998, the firm was manufacturing and selling its own meters. Xianfeng is the largest producer of "smart" gas meters, which use stored value cards, in China. Demand for its products has grown so rapidly that the firm has plans to double capacity by 2004. The company received an international patent for its gas valve design, which reduces risk of gas leaks and explosions. Its "smart card" meter technology—households buy a stored value card from the bank and use gas on a pay-as-you-go basis—is becoming popular with gas companies that are having difficulty collecting user fees. Unfortunately, Xianfeng is experiencing similar bill collecting difficulties, as most of their customers are SOEs facing financial problems. At present there are twenty-one cities and provinces using their technology including Beijing, Shanghai, Xi'an, and Inner Mongolia. The firm employs 125 staff, of whom twenty-five are engaged in R&D; production workers number over seventy.

Cluster Competitiveness

Why has this high-tech cluster developed in peri-urban Hangzhou? Our research indicates that the two most important factors driving the cluster's development are (i) personal ties to the Hangzhou area (e.g., the owner or major investors are from the area), and (ii) Hangzhou's growing reputation as second-tier national research center (Beijing and Shanghai are first-tier).

Hangzhou's research reputation is primarily based on the reputation of Zhejiang University. This university attracts top students and professors to the region, who provide the firms with a talented local labor pool, research partners, and consultants. Some firms subcontract product development to groups of professors at Zhejiang University. The success of the technology development firms, in turn, has strengthened a number of technical educational institutions in Hangzhou, creating a virtuous cycle. Many of the leading educational and research institutions are located in the Major Section, such as the Hangzhou University of Electronic Sciences and Technology. The nearby technology-oriented firms provide application opportunities for researchers, further contributing to Hangzhou's national research standing. Combined with Hangzhou's high quality of life, this reputation enables the firms to compete with Beijing, Shanghai, Guangzhou, and Shenzhen in attracting quality researchers, engineers, and investment.

All of the study firms indicated that, when looking for a place to locate in the Hangzhou area, they chose to locate in the Major Section to take advantage of preferential tax policies and low land lease rents. The firms continue to receive tax advantages on all new products. Another reason for locating in the Zone is that the park's administration can help to speed up approval of applications for new projects and products (a nationally mandated requirement in China). In most cases, at the time the firms in the Major Zone were established (including the study firms), the two other zones of the HHTZ were not yet developed. Essentially, then, the Major Section was the only option for the location of high-tech activity.

More recently, pressures have emerged, sometimes negative, that are driving firms' adaptive behavior. Some of these are specific to the geographic location, others relate more generally to SME R&D in China. Geographically specific pressures include:

(i) **Rising costs of living:** High land and housing costs affect firms' labor costs and their ability to recruit and retain staff. Hangzhou, as a leading tourism and historical city and the provincial capital and economic center, is experiencing significant real estate appreciation. Hangzhou has the fifth highest housing costs in China, after Beijing, Shanghai, Guangzhou, and Shenzhen.²¹ Housing supply and choice are limited by the lack of fast public transit routes to suburban and peri-urban areas, combined with the fact that most personnel still do not own private vehicles.

(ii) **Financial resource limitations:** There is a lack of venture capital available, particularly relative to Beijing.

(iii) **Product approval backlog:** Because so many new products are introduced in the area, there is a queue for government approval of new products.²² Given the importance of being the first to unveil new high-tech products, this is a serious impediment vis-à-vis competing areas. Local official standards agencies, depending on their degree of product and technology understanding, and cooperation with local technology based firms, may also affect competitiveness, since developers of new technology must adhere to set national standards.

(iv) **The Shanghai shadow effect:** Hangzhou competes with Shanghai to recruit and retain top researchers and investors. There is a constant risk of losing talent to Shanghai. On the positive side, however, this competition pushes Hangzhou to

innovate and to undertake activities that can deliver financial rewards. Hangzhou's quality of life is a further compensating factor that somewhat counterbalances the higher wages for first-rate technical talent in Shanghai. Another plus for Hangzhou is that Shanghai's knowledge resources are readily accessible—it is less than a two-hour trip by expressway or high quality train between the two urban areas.

More generic (nonspecific to Hangzhou) pressures on technology clusters include local protectionism, which makes it difficult to develop national markets. For example, local regulations that protecting local producers have excluded Xianfeng from selling its gas meters in certain markets. Such protectionism ultimately limits China's ability to develop national technology clusters of excellence. The middle level of technology, the focus of activities in the Major Section, is particularly hard hit by protectionism. High-end technology breakthroughs are more likely to be produced in only one location in China and thus not subject to protectionism. By contrast, low technology products, such as garments, are often deemed not worthy of protection.

Cluster Dynamics

Because of the diversity of products produced by firms in the Major Section, inter-firm linkages are limited. Rather, the main *cluster effect* occurs between knowledge institutions (academia, research institutions) and the firms. There are 78 research institutes, 16 colleges and universities, 13 technical institutes, 19 natural science research organizations, and 9 vocational and national laboratories located in the Major Section. Linkages to Zhejiang University, in particular, are often critical to technology development and staff recruiting. Nonetheless, educational linkages are not limited to Hangzhou. Many of the firms have close relationships with top technical research institutions in other parts of the country. UNITOP, for example, maintains close linkages with Xi'an and Chengdu Universities. A few firms also partner with international academic and research institutions. Partnerships with research institutes, and the resulting geography of linkages, are thus highly product-specific. In addition to partnerships with research institutions, firms may enter into joint ventures with other firms in order to innovate. For instance, UNITOP has a joint venture with a California-based company.

Inputs tend to be sourced from a wide geography—regional, nationwide, and international. Parts movements tend not to be affected by protectionism, unlike intermediate and consumer goods. Business services, however, such as legal and accounting services, tend almost always to be purchased locally. This occurs not because of any industrial specialization (e.g., law firms specializing in technology), but because interpretation of national administrative guidelines and local practices and laws, varies widely by province and municipality. Also, personal contacts between professional firms and government officials are important in these matters. Banking, too, is done locally.

As is the case throughout China, firms in the Major Section do not have any formal mechanism (such as a tenants' organization) for interacting with each other, or for dealing with official agencies as a group. The fact that the Zone as a whole, and the Major Section in particular, is physically fragmented and its products diverse further works against interaction, formal or informal, among the firms. The fact that suppliers are not allowed to locate in the Zone reduces potential positive cluster dynamics, such as knowledge spillovers and co-development. The medium-size tech firms take supplier relationships seriously, and frequently second staff to supplier companies as part of training and information exchange initiatives.

Relationships with local governments are mixed, but highly valued. As noted above, local governments can significantly affect competitiveness, based on the speed with which they process approvals for new products or interpret standards to the advantage of local firms. Sometimes relationships are particularly close. For example, Zhongli has a close relationship with the provincial government, which enables the firm to test their broadcast technology products. Because of product development firms depend so heavily on local governments, local government agencies can be supportive and/or rent-seeking. Experiences vary widely, underscoring the importance of these relationships. If good ones exist, firms are less likely to relocate, and to spend the considerable time it takes to establish new social and business networks at the new location.

Spatial Dynamics

The separation of manufacturing and R&D functions has emerged as a significant trend. Many firms are moving production to the Ningbo peri-urban area to take advantage of lower labor and land costs, more attractive tax incentives, simpler approval processes for new products, and reduced levels of bureaucracy. Ningbo enjoys subprovincial status, and therefore—unlike Hangzhou—does not have overlapping responsibilities with the provincial government. For example, UNITOP has already moved its production to the ETDZ in Ningbo Municipality. Similarly, Hangzhou Zheda Hyflux has moved one of their production lines to peri-urban Ningbo.

These firms have chosen, with good reason, not to move their R&D and sales functions out of the Hangzhou extended urban region. Retaining technicians and researchers who are reluctant to leave the amenities and technical networks of Hangzhou City is of paramount importance. Firms also know that they must maintain access to soft support from the municipal and provincial governments. Accordingly, on the one hand, privileges accrue from Hangzhou urban core headquarters, even as the companies manufacturing functions reap additional benefits in peri-urban Ningbo. Further, by keeping the R&D function in Hangzhou City, the firms maintain cooperative linkages with research and educational institutions, which reduces their risk of falling behind Shanghai technically.

Another option that many firms are considering is to move to the newer Zhejiang Scientific and Technology Park across the river (the second zone of the HHTZ), in the recently annexed Xiaoshan District (see Map 2). Several of the firms interviewed have outgrown their current locations, and they need more room to expand research and production. In this case, firms have the option of keeping all their functions together in the new Park across the river. Hyflux may make the move in order to be near big-name locators (large multinational corporations) that are situated in the new Park. These high profile firms lend a brand image to the Park and its fellow tenants, and also serve as a potential customer base (e.g., for water filters), both of which enhance the value of locating at the newer site.

The Major Section was built about twenty years ago. As such, the multistory buildings are not ideal for modern manufacturing, and room for expansion and the flexibility to reconfigure internal spaces is limited. The lack of an active tenants' association or strong support from the Major Section's administration for product development means that there are few countervailing advantages to staying there. The fact that the headquarters of the HHTZ is now in the new Park across the river is an additional factor encouraging firms to relocate. In effect, it appears that the more successful firms in the Major Section "graduate" to the zone across the river, and that this dynamic is likely to continue.

4.2 The Eider Down Cluster

The *Xiaoshan Feather and Down Industrial Garden* is the world's leading feather and down production cluster. It accounts for over 50 percent of the world production of down products, and 85 percent of world production of feathers. While there are individual down factories elsewhere in China, there is only one other cluster starting to emerge (in Tongliang County in Chongqing Municipality in western China), and it only processes feathers.²³ Feather and down production has been designated a pillar industry by the Zhejiang provincial government. Indeed, feather and down production account for 80 percent of the GDP of the township of Xintang, in Xiaoshan District of Hangzhou Municipality, where the cluster is located. The enterprises have been physically grouped in a township level industrial park called the Xiaoshan Feather and Down Industrial Garden. The Industrial Garden was opened in April 2000, a product of cooperation between the local township government and the down firms. Previously, the enterprises had been scattered in villages and towns of Xiaoshan County. The Industrial Garden is already filled to capacity; an ETDZ (Municipal Level) is being built two kilometers distant that will accommodate the overflow, along with other types of enterprises.

The Industrial Garden contains approximately two hundred feather and down firms, employing thirty thousand people. About half of the firms focus on export; the other half, typically the smaller firms, concentrate on the domestic market and some subcontracting to the larger firms. (It is more difficult for the smaller firms to obtain export rights and licenses.) Large-scale processing and use of feathers, obtained primarily from Sichuan and Chongqing,²⁴ and employment of large numbers of low cost (primarily female) labor characterize the cluster. The Industrial Garden restricts entry to producers of down and related products; suppliers (e.g., textile producers and packagers) are not allowed to locate in the Garden.

There are about twenty large firms. We focused on Hangzhou Wellmei Home Textiles Co. Ltd. (brand name: Wellness), a large bedding products firm that employs about seven hundred staff; and the largest firm in the cluster, CNGG Zhejiang North Swan Dress Holding Co. Ltd. (Brand Name: Beitiane), which produces feathers and down garments.

Cluster Competitiveness

Given its location in Hangzhou's relatively high cost peri-urban area, the down cluster, as a labor-intensive industry, might appear vulnerable. The wages of the large labor force have increased more than five-fold over the last ten years from 200–300 RMB per month to 1,400 RMB. Labor is considerably less expensive in western China. The cluster is also characterized by higher taxes, stronger enforcement of environmental regulations, and fewer and lower tax incentives, than competing areas. The Hangzhou down firms identify this lack of a level playing field, particularly in terms of environmental standards, as a key concern. Further, cluster firms obtain their prime raw materials, feathers and textiles, from other regions of China. The feathers come from 2,000 kilometers away in Sichuan, where a competitor cluster is trying to establish itself, as noted above, in the Chongqing peri-urban area. Textile inputs are sourced from a wide variety of locations in China, e.g., Jiangsu, Shandong, and Northeast China. Locally produced textiles are deemed to be of insufficiently high quality to justify the significant costs and market expectations associated with down products (e.g., performance sports equipment marketed in North America and Europe). But even local officials and firm owners of the competing feather cluster in Chongqing see the Xintang cluster as too embedded to dislodge, except in terms of basic feather processing.²⁵ How can this be?

Ironically, much of the explanation relates to pressures facing firms in the industry as a whole. As a slow-growing, very competitive and fast-changing industry, connections with buyers and a reputation for reliable delivery of quality products are vital. The cluster itself has global name recognition, and the larger firms enjoy brand name recognition. In addition, the ability to deal with buyers, such as Wal-Mart and JC Penney, using sophisticated computerized design, ordering, and distribution systems, under strong deflationary conditions, is very important. The firms in this cluster also benefit from skilled management, an ability to recruit and retain good technical staff, and many years of experience in responding to the fashion world's fluctuating designs, products, and market conditions. One down side of the cluster location is that these firms employ many production laborers, who are more expensive in coastal areas, such as Hangzhou, than in the interior. However, this is not a serious threat to their viability because labor only accounts for 7–10 percent of their overall costs. This higher cost of labor, relative to other regions, can thus be justified, given the competitive advantage that other Xintang-specific factors provide to the down firms. Synergy among the firms produces further benefits, discussed below. Accordingly, as the industry becomes more competitive, its location in Xintang may actually convey advantage to this well-established cluster rather than to lower labor cost competitors elsewhere.

Cluster Dynamics

Most of the firms in the down cluster started as privately owned entities, but were officially designated TVEs. Thus, their corporate cultures are highly entrepreneurial and all are locally owned with strong ties to the area. The firms enjoy strong support from provincial and local governments. The relationship with the township government is especially strong, based on personal connections. Close relationships with local governments are manifest in local public policy, decision-making, and investments that are favorable to the cluster.

The Industrial Garden is a major asset. The township does not provide tax incentives, as this power is not delegated to townships. However, the firms benefit from subsidized land leases, and the economies inherent in sharing the cost of key infrastructure and facilities. For example, the Industrial Garden centrally provides water, gas, and power supply at lower bulk rates.²⁶ These advantages attracted most of the scattered down cluster firms to the Industrial Garden.

The firms have formed a Xiaoshan feather association, which is strongly linked to the national feather association (Enterprise of China Feather Industrial Vice Council). The North Swan General Manager is vice chair of the national association.²⁷ Many of the firms are also members of the Xiaoshan Chamber of Commerce. A key role of the district feather association is to host conferences on seasonal styles and markets, arrange seminars on new techniques, conduct market research, disseminate information through a newsletter, and advocate the interests of the firms with local and senior governments. Further, the association works to strengthen networking among firms. The proximity of firms in the Industrial Garden leads to knowledge spillovers and considerable informal networking on problems, issues, and innovation. Networking, in turn, leads to more effective production (e.g., subcontracting within the Cluster), especially when demand is too high for one firm to handle.

The larger firms producing down garments, such as North Swan, have adopted computer-assisted design and production processes. To address their need for technically trained design staff, North Swan has developed close links with the Xiaoshan Zhashan Professional School, located in nearby Linpu town. Focused on garment production and

design, the school provides technical personnel, and its faculty occasionally teach training courses at the firm. However, the linkages between the down garment firms and the school are weaker than those that exist between the science park firms and their nearby universities. In the case of down garment firms, the schools have no funded research or product development role. But as the industry becomes more dependent on IT-supported processes, connections to technical educational institutions will likely become stronger.

Spatial Dynamics

At the same time that the cluster has become more physically concentrated, it has developed closer relationships with the outside world, both near and far. Transportation infrastructure to Hangzhou City core has improved substantially. This enables firms to access certain high level services there, and to deal with the provincial government. However, most producer services, such as banking, are obtained locally in Xiaoshan City (a district level city of the municipality). The 2001 relocation of the Hangzhou international airport nearby has enhanced the Cluster's location advantages, which include easy access to Hangzhou's port and the expressway to Ningbo.

Interestingly, managers in the cluster made it clear in our interviews with them that they have no intentions of moving to lower cost production regions, whether nearby Ningbo (with its lower cost structure and large-scale, efficient ETDZ) or further afield (e.g., western China). Nor do they see a need to separate management, design, and production functions. Local ownership is one reason for keeping the cluster in Xiaoshan. Most managers and personnel are also local. More important factors include the cluster's overall reputation, which attracts skilled workers who engage in innovation and learning; preferential policy treatment from local governments; and marketing relationships with overseas buyers who are already familiar with the Hangzhou area. In other words, the cluster is highly embedded locally.

In many ways, the Eider Down Cluster would seem similar to the women's shoe cluster studied in the Chengdu region.²⁸ But in that case, and the case of the men's shoe cluster that has migrated to the Chongqing region, coastal areas (in Guangdong, Fujian, and to a lesser extent Zhejiang Provinces) have witnessed rapid downsizing of shoe manufacturing. Why the difference? We have no definitive answer. It may be that the down cluster is more concentrated—it is essentially the only one in China—whereas shoe manufacturing was located in a number of clusters along the coast. The fact that labor represents a higher percentage of the cost structure in shoe manufacturing may also provide part of the explanation. And, of course, the main physical input by value, feathers, are light in weight, which minimizes transportation cost advantages of locating near the source of the raw material in western China.²⁹ An alternative explanation is that the down cluster is actually more vulnerable than it is perceived to be, and that it will eventually migrate to the Chongqing region.

In summary, the surprising geographical staying power of this cluster is built on long-established, trust-based relationships with major buyers; strong, experienced managers and technical staff; and institutional support from local governments and associations. Although labor is more costly than in most of China, attracting migrants from low-wage regions, such as Sichuan or Hunan, is not difficult. The actual production of the products is much less a source of competitive advantage than relationships with buyers, design knowledge, production experience, institutional support, and synergy benefits associated with clustering.

5. Labor Dynamics, Relationships, and Perspectives

Extensive employee interviews were undertaken in the two clusters that are the subject of this paper³⁰ as well as in the three clusters analyzed in the Chengdu peri-urban region.

The following discussion of peri-urban labor dynamics in the two Hangzhou clusters is based both on analysis of formal questionnaires, and on information obtained through open-ended discussion between employees and interviewers. Because employee profiles between the two Hangzhou clusters exhibit substantial differences, we have, where relevant, differentiated between the two clusters in discussing worker characteristics and perspectives. We found that insights into opportunities and pressures that workers face could often be best obtained by asking employees to describe their life histories. Five of these life histories, of female workers, are presented as boxed case studies.

In the high-tech cluster (Major Section), the situation is more complicated. Firstly, degree holders from accredited universities (researchers, engineers, technicians) can obtain an urban *hukou* relatively easily.³¹ In response to our questionnaire, many employees thus identified themselves as local (based on their *hukou* status), though few had lived in the area for more than ten years. These managerial and technology workers tend to be aged 25–30, and educated. The relaxation of *hukou* control in Hangzhou city proper—degree holders are encouraged to migrate to the city, as is the case in most large Chinese cities—is the prime reason why so many of the high-tech cluster migrants have *hukou* status, and consider themselves to be local. By contrast, in the case of the down cluster, those who identify themselves as locals were truly so, having been born in Hangzhou. Their families have lived in the area for many generations.

The geographic origin of migrants to the high-tech cluster is wider than in the case of the down cluster. Whereas the latter draws its workers from poor provinces, particularly the rural areas, the high-tech cluster draws skilled graduates from across the country, from cities and rural areas, from both affluent and poor regions.

Employee Composition

In both clusters, most employees are not local. In the down cluster, this is clearly the case. For example, at North Swan, 350 of 610 staff (57 percent) are migrants. Wellmei management reports that 75 percent of their staff are migrants. Migrants to the down cluster are primarily from Henan, Hunan, Anhui, Jiangxi, and Sichuan provinces, and Chongqing Municipality.

Reasons for Migration

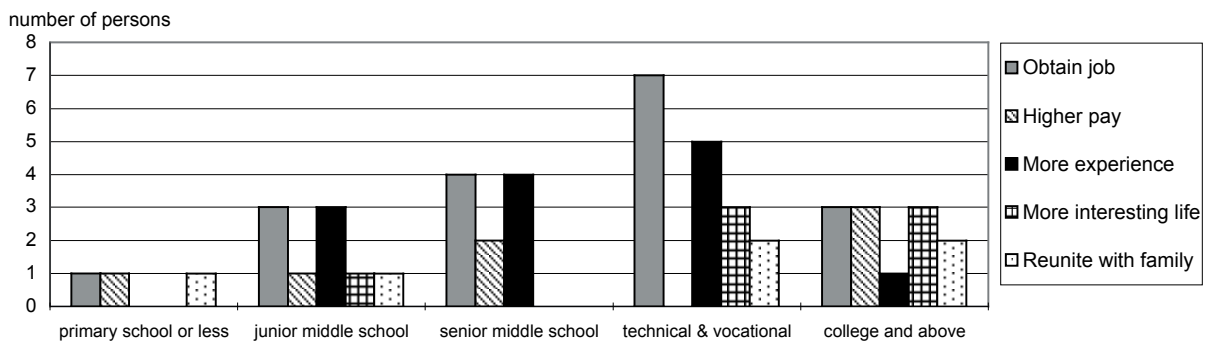
When we questioned study area workers on their reasons for migration, we found considerable variation based on education (see Figure 6). Workers with college or university education tend to migrate for salary and lifestyle (quality of environment) reasons, while those with less education, including those with technical and vocational education, seek employment opportunities and more work experience. In addition, we found evidence of a second generation migrant effect—young adults, who are the children of migrant workers, come to Hangzhou to be reunited with their parents after being schooled in the family's home town (see Case Study 4).

Case Study 1: Seeking personal development opportunities
The story of a female technician at North Swan Company in the down cluster

I am thirty years old and a local resident here in Xiaoshan District. In 1992, when I graduated from high school, I went to Shenzhen with my sister and sister-in-law to get a job there as a production worker. At that time, the opportunities in my hometown were not yet as good as in Shenzhen. But after Deng Xiaoping's tour to South China, my hometown, along with other places in China, sped up its development pace. It began to enjoy preferential policies, which previously only applied to Shenzhen and other SEDZs. My hometown was thus full of opportunities for personal development. Therefore, after one year working in Shenzhen, I decided to come back to Xiaoshan, my hometown. I got my job through an introduction by my local friend and have already worked in this company for almost ten years. Now I have been promoted from production worker to a technician and enjoy a higher salary. So far as I know, a lot of people here have had a similar experience.

Implications: To young high school graduates, it is more important to seek challenging opportunities to gain skills and experience, but their hometown is still their first preference when the opportunity is there. This is echoed in the case in the shoe cluster in Chengdu municipality, where quite a number of employees are returned migrants who worked in either the Pearl River Delta or Yangtze River Delta before they came back to their hometown. The story also indicates how national development policies can differentially affect the fortunes of places and their residents.

Figure 6: Reasons for Migrating, by Level of Education



Source: Based on Hangzhou worker surveys conducted by the authors, January 2003.

Job-Seeking Behavior

Many channels are utilized to find jobs in urban China, including relatives and friends in source and host areas, government-sponsored employment agencies (run both by source and host local governments),³² private employment agencies, walk-ins (sometimes in response to factory gate postings), advertisements (newspapers, Internet), and university recruiting. In general, as indicated by Table 3, higher educated employees tend to have more channels available for finding employment, and rely less on friends and personal connections. Local employees in the high-tech cluster use a wide range of channels to find

Case Study 2: Seeking a good stable job

The story of a female production worker at Pioneer Company in the high-tech cluster

I am twenty-two, and from Linan County of Hangzhou Municipality. It takes me about three hours to get here by a long distance bus. I graduated from a vocational high school and came to Hangzhou seeking a job with the help of my relatives, who are local residents in Hangzhou City. I came to Hangzhou in 1998. My first job was selling clothes in a small shop. I came to work at 8 o'clock in the morning, but worked till very late at night until the shopkeeper was pretty sure that there would be no more customers. I hated this nonstop working environment and quit the job after only two days. I thought this situation might be just an exceptional case, so I found a similar job in another shop. But the same situation occurred. I tolerated it for one month while trying to find a new job. Eventually I got my current job in this company, which has a normal eight-hour workday. I have already worked here for more than four years. I am a production worker in the company and enjoy the work, even though my salary here is lower than my previous ones, where I could earn a high bonus if I sold more clothes, which I did. Currently I rent a room nearby. I like this stable job and would like to become a local resident here if possible.

Implications: To most relatively short-distance migrants without a degree or special skills, it is more important to have a stable job that allows time for other activities, and to stay in the area, rather than to make more money. This is somewhat different from long-distance migrants, who sometimes prefer to have a more demanding job but correspondingly higher pay.

Table 3. Means of Finding Current Job, by Education Level

Unit: Percentage of workers (%)

Education Level	Friends	Walk-ins	Labor Market Exchanges	Newspaper Want Ads	School Placement / Job Transfer
Primary School	100.0	0	0	0	0
Middle School	56.0	20.0	16.0	0	8.0
Senior Secondary	46.7	20.0	13.3	10.0	10.0
Technical & Vocational	34.6	24.0	15.4	15.4	11.5
College & University	4.0	32.0	24.0	40.0	0

Source: Based on Hangzhou worker surveys, conducted by the authors, January 2003.

their jobs, particularly official employment agencies, introduction by friends, newspaper advertisements, and walk-ins. Local employees in the down cluster, on the other hand, usually obtain employment through friends and relatives.

The government-run employment agencies are very important to migrant workers. Over 21 percent of all migrants find their job through these labor markets. More skilled and educated job seekers tend to use employment agencies operated by higher levels of government, such as at the municipal or district level. Unskilled job seekers rely on

township level labor exchanges, which are more directly associated with the firms. Chain migration, whereby workers learn of job opportunities from friends and relatives who have migrated ahead of them, remains important for all migrants. Migrant production workers in the high-tech cluster normally obtain their jobs through introductions from hometown friends who work in the same enterprise or nearby. Down cluster migrants also rely on hometown introductions, but to a lesser extent.

Salaries and Training

Fifty-nine percent of white collar (managerial and administrative) and fifty-three percent of technical workers earn over 1,500 RMB per month. The majority of production workers (85 percent) earn between 700 and 1,500 RMB per month. Pay among support staff (cleaners, drivers, etc.) can vary widely, but 40 percent earn less than 700 RMB per month. Gender-based salary disparities are not large; the disparities are widest in white collar work: 67 percent of men earn over 1,500 RMB per month versus 52 percent of women. However, male and female technicians earn similar wages, and female production workers earn more than their male counterparts.³³

Workers in the high-tech cluster are more likely to receive training (44 percent) than those in the down cluster (18 percent). Training is highly associated with one's role. Across the clusters, 51 percent of white collar workers (managers, administrators) had received training, compared with 28 percent and 23 percent of technicians and production workers, respectively. Forty-one percent of males, but only 28 percent of females received training—this may be partially explained by the higher percentage of women in production roles.

Position and Mobility: Intra-firm and Inter-firm

As expected, position in firms is related to educational attainment. However, in the case of the down cluster, *hukou* status also plays an important role. Our research indicates that migrants have less chance of being promoted to technician roles, let alone management roles. The opposite situation exists in the high-tech cluster, where the production workers are predominantly locals, and the migrants do occupy management and research positions. Firms higher up the value chain tend to rely more on merit in making promotions, and rely less on local connections. However, in the case of Hyflux, when the newly appointed manager from Singapore applied merit and credential principles to the virtual exclusion of all others, including relationships and seniority, stress within the firm increased substantially.

Inter-firm mobility is low in the case of both clusters. Job turnover rates are low in general. In the down cluster, turnover rates are only 10–15 percent annually. And when employees do move, they are likely to take similar work in a nearby enterprise. This is very

different from the PRD area, particularly Dongguan, where many workers change their jobs and enterprises quite often.³⁴ Employees in the Hangzhou region report being generally satisfied with job conditions and pay. This may be related to the fact that the distribution of salaries within firms is less skewed in the YRD (of which Hangzhou is a part) than in the PRD. Another factor that contributes to better employer-worker relations in Hangzhou SMEs may be that wealth in the study area is less dependent on windfalls from increases in land values and more dependent on actual production profits. This is an incentive for employers to treat workers better, and thereby retain them longer. Also, migrant workers

Case Study 3: Escaping from unfair treatment

The story of a female designer at North Swan Company in the down cluster

I am thirty-two, and from Zhoukou region in Henan Province. I graduated from high school and opened my own tailor shop in my hometown with a good income. The business was interrupted when I became pregnant. Some years later, I moved to Zhengzhou, the capital of Henan Province, where I opened a private occupational school for teaching tailoring. It was generally successful and my school became well known by local people. Begrudged by some people in the similar line of business, I was squeezed out. Considering my unfair treatment and that my school could be no longer operate properly, I gave up my struggle. My family then decided to migrate to Xiaoshan, based on the introduction of my hometown friend, who had held a job in the host area for some years. I got my current job as a designer through an appointment with the company, and have worked here for nearly three years. I need to earn more money to support my family and make ends meet. I am still not sure if we can earn enough money to support my child's schooling here since the cost for schooling here is very high, at least in the eyes of us migrants. We need to pay a supplementary fee for our children's schooling here if we want them to have an equal education to the local children. Because of this high schooling cost, we might have to send our kid back to stay with relatives, or our whole family will move back to our hometown. But before this happens, I will try my best to earn more money. Relying on my high skill and good experience, I hope I can find a job with higher pay.

Implications: In the lagging regions, particularly West China and some parts of Central China, market rules and fair play are still fragile and easily broken by the intervention of either local governments or other forces. This encourages talented local people to leave, and discourages young local entrepreneurs. The case also indicates how the issue of children's schooling for non-*hukou* migrants can affect their decisions to stay, and cause personal hardship.

in the Hangzhou peri-urban area are more likely to stay on, and settle down than return to their home region. This is in contrast to migrants in the PRD and newly developing western China. In the PRD, migrants often feel unwelcome; in western China, young workers express less desire to settle down in the peri-urban areas.

Not surprisingly, job shifting results in higher wages for 71 percent of those interviewed. However, nonlocals are more likely to take a job that pays the same or less than their previous job (35 percent) than locals (25 percent). This may indicate that nonlocals have less market power because they cannot sustain themselves for long periods without a job. It may also indicate that nonlocals have greater difficulty in having their experience recognized as a basis for higher pay or position, as indicated in Case Study 3 and discussed above.

Housing and Transportation

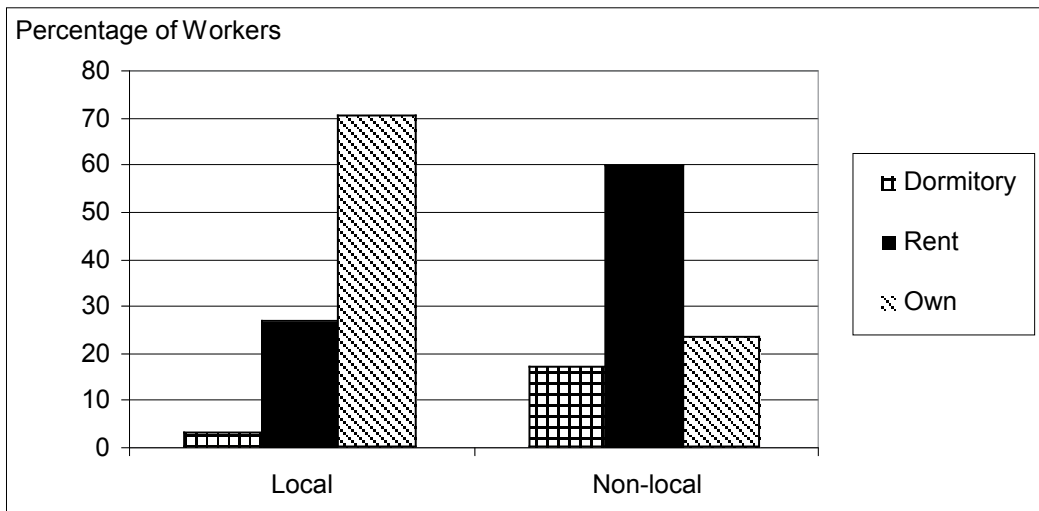
In the down cluster, migrant workers tend to live nearby (in the township), either in dormitories (North Swan only) or rented rooms. Firms that do not have a dormitory normally provide a housing subsidy that partially covers housing costs. A greater share of migrant workers commute to work on bicycle or on foot, rather than by motorcycle, although motorcycles are becoming more popular with migrant workers. Local workers usually own their own homes and commute by motorcycle.

Despite recent significant improvements in public transportation and roads, employees in the down cluster rarely travel to the Hangzhou central business district (CBD)—only 15 percent travel to the CBD more than twice a month.³⁵ Lives of the workers are highly localized, centered on the local community. By contrast, 75 percent of the high-tech cluster workers travel to the CBD more than twice weekly.³⁶ Age is not a factor in explaining frequency of travel to the CBD.

In the high-tech cluster, most employees own an apartment, even in the case of relatively recent migrants. Banks readily provide mortgages to those with secure employment and urban *hukou* status. The exception is non-*hukou* migrants (production workers) who collectively rent an apartment or house in an urban residential quarter or nearby village. Forty-five percent of employees interviewed in the high-tech cluster indicated that they used private motorized transportation (cars, taxis, or motorcycles) to commute to work; 39 percent commute by bus. Previously, employees lived closer to the workplace. But, with the privatization of the housing market and improvements in the urban bus system (associated with this formerly peri-urban area being enveloped into the contiguous urban fabric), workers are more geographically scattered. This in turn has led to the cessation of firm-provided bussing, which was an important mode of travel to work ten years ago.

For both clusters, as indicated by Figure 7, most locals own their own housing (70.3 percent) whereas nonlocals are more likely to live in a dormitory or rent (76.6 percent). Owning a house is not correlated with income levels, but with migration status, as indicated above, and with age. For example, only 22 percent of 18–23 year olds own their own housing unit, compared with 63 percent of those aged 30–39.

Figure 7. Type of Residence, by *Hukou* Status



Source: Based on Hangzhou worker surveys conducted by the authors, January 2003.

Social Services

Although *hukou* status is not an impediment to obtaining employment, it does affect access to social services and benefits.³⁷ *Hukou* status is becoming easier to obtain in the peri-urban area, but it is still beyond the reach of many production workers, unlike in more remote regions (e.g., peri-urban Chongqing).³⁸

Migrant workers in Xintang are eligible for a local (township) *hukou* when they have held a secure job in the area for at least three years and own a local residence. However, this is something of a “Catch 22” because without a local *hukou*, workers are not eligible for a commercial home mortgage, and do not qualify for subsidized housing. The local government subsidizes the latter by providing low-cost land to certain developers who agree to pass on the subsidy. As a result, the rapidly rising cost of housing in both study areas has a greater impact on the migrant workers than the locals. Migrants find it more difficult to come to the region on a speculative basis, without some form of supportive social network in place, thereby increasing the importance of chain migration.

Another area where *hukou* status makes a big difference is children’s schooling. Non-*hukou* parents have to pay substantial additional fees to send their children to local schools. Thus, in many cases, children are sent back to the migrants’ hometown for schooling. Unofficial schools run by migrants for migrants’ children now exist in peri-urban Hangzhou, as in other large extended urban regions, which children can attend for a low fee. However, the quality of these schools may be low, and the credential is not normally recognized if the child wishes to pursue a higher level of education. By contrast, in new peri-urban areas, as our research in the Chengdu peri-urban area has indicated, workers are younger and less likely to have children. Access to education for children is a bigger issue in coastal peri-urban areas. The problem is exacerbated by the fact that it is much harder for production workers to obtain a *hukou* in peri-urban coastal areas such as Hangzhou than in western peri-urban areas such as Chongqing, or to a somewhat lesser extent, Chengdu.

Non-*hukou* workers cannot collect certain other benefits that the enterprises provide jointly with local governments, such as unemployment insurance, health care, health insurance, and pensions. All firms contribute to pensions (the enterprise contributes 70 percent, the employee 30 percent), and some pay into unemployment and health care delivery schemes. However, community-level government units are responsible for delivering many of these benefits, and they require that a worker has a local *hukou* to collect these benefits. Therefore firms do not make contributions on behalf of non-*hukou* workers.

Health insurance coverage varies significantly between the clusters. Ninety-two percent of employees in the high-tech cluster have coverage, versus just 33 percent of employees in the down cluster. Production workers (50 percent are covered) are less likely to have health insurance coverage than those in white collar or technical positions. In both clusters, migrants are more likely (53 percent) to rely on pharmacies and in-house enterprise clinics for medical advice—instead of hospitals—than are locals (40 percent).

Most of the firms obtain temporary resident permits for their production workers. Interestingly, fees for these temporary resident permits are lower than in the PRD region (8 RMB per month versus 10–30 RMB per month in the PRD).

Future Intentions and Expectations

Our research queried workers with regard to their future location and work expectations. There is wide variance between the Hangzhou clusters in this regard. Ninety percent of employees in the high-tech cluster want to stay in the Hangzhou region, whereas only 38 percent in the down cluster were certain that they wanted to stay. Still, in contrast to the situation in the Chengdu peri-urban area, based on the same methodology, more of the production worker migrants in the down cluster expect to settle in the Hangzhou extended urban region, if possible. There are several reasons for this expectation. First, Hangzhou

Case Study 4: Seeking to be an urban resident
The story of a female second generation migrant
at North Swan Company in the down cluster

I am twenty years old and from a village in Shangrao region in Jiangxi Province. When I was five, I came to this place with my parents. Three years later, my parents thought it was high time for me to go to school before it was too late. But the cost of schooling here, then and now, was too expensive for us. So my parents sent me back to my hometown. I had my schooling there for nine years. After I graduated from middle school, I immediately came back to this place because I had such nice recollections of my three years of childhood here. Up to now, I have worked in this place for four years. When I first came back, I worked at a hotel as a room cleaner with a monthly salary of 500-600 Yuan. I worked there for two years. Later, my mom thought it might not be good for a girl to work as a cleaner for life, so she introduced me to her clothes-making factory, where I was hired as a sewer with a monthly salary of 700-800 Yuan. After a half year there, I met my current boyfriend, who is a local resident in this small town. Because my factory is far from this town, twenty minutes by motorbike, my boyfriend urged me to come to this North Swan factory. I am now working here as a quality controller with a monthly salary of more than 1,000 Yuan and live in my boyfriend's home. I plan to marry my boyfriend. By doing so, I will become a local resident here, which I have dreamed to be ever since I was a child. Both my aunt and cousin have already become local residents here by marrying local people. My parents still work in the nearby place. My younger sister didn't come to this place after she graduated from a vocational school. Instead she is now working somewhere in Guangdong with a monthly salary of 1,000 Yuan too.

Implications: The second generation migrants often do not feel strong ties to their parents' hometown. They are extremely keen to become official urban residents of their adopted home. One way they can obtain a local *hukou* is through marriage.

is a more mature peri-urban area. Many nonlocal workers are either second generation migrants—the children of migrants who may have been sent back to their parents' hometown for schooling—or first generation migrants who have stayed in the host area for many years. As a result, ties with source areas have weakened, especially for second-generation migrants, and thus are less important in their future plans. Second, as peri-urban areas in the Hangzhou region mature, their attractiveness as places to live increases, encouraging people to settle there. The local environment is especially appealing to those who have migrated from poor areas in the central and western regions. As migrants remain in the area, they become more familiar with urban life, and realize that staying on is an attainable expectation. By contrast, in the Chengdu shoe cluster we studied, many Sichuan rural migrants still view staying on in the urban area as an unattainable dream.³⁹

Migrants who want to stay, but do not meet *hukou* requirements, often marry locals (see Case Study 4). If at least one person has a local *hukou*, then the spouse and children also gain *hukou* status.⁴⁰ Marriage to a local resident provides an easy way around demanding *hukou* criteria.

Some workers have indicated that they wish to leave the Hangzhou region. As shown in Figure 8, the prime reasons for wanting to leave relate to the education of their children, followed by the unfriendliness of local people/not being accepted locally. The latter effect was reflected in difficulties that migrants had in being promoted in the down cluster firms, as described above.

Case Study 5: Seeking a better life for the future
The story of a female university degree holder at Zhongli Broadcast
Technology Co. Ltd in the high-tech cluster

I am twenty-six years old and graduated from Yunnan University three years ago with a bachelors degree. I got a job as a technical researcher in Hunan Province, my home province, right after graduation. I worked there for just one year and then came to Hangzhou through the encouragement of my boyfriend, who was working in the city at the time. My boyfriend is from Jiangxi Province and studied with me at the same university where we fell in love. I got my current job through the Hangzhou personnel market and have worked in this enterprise for nearly two years as a technical researcher developing broadcast equipment. My salary here is much higher than in Hunan. Currently, my boyfriend and I rent an apartment at a cost of 1,000 Yuan per month, but we have already bought an apartment at a cost of more than 400,000 Yuan. We are now decorating it. We believe we will have a better life and future in this city.

Implications: Degree holders in China have higher mobility in job markets. Therefore, in seeking a better future, there is a big incentive to change jobs and location of work.

Figure 8. Reasons for Moving Out



Source: Based on Hangzhou worker surveys conducted by the authors, January 2003.

In the high-tech cluster, future intentions were more certain, and push factors encouraging out-migration much weaker. The fact that most of the technical workers have obtained an urban *hukou* indicates that they have adopted Hangzhou as their new home.

6. Emerging Third Stage Peri-Urbanization Dynamics

A new set of dynamics is coming to the fore in peri-urban regions in the YRD: we call this Stage III peri-urbanization. These dynamics, based on the case of the Hangzhou peri-urban region, can be summarized as follows:

(i) The fate of coastal peri-urban clusters is highly variable. Lower costs of factors of production in western and interior China will not automatically induce clusters to move. Although this has happened in some cases (e.g., women's shoe manufacturing moved from the coast to the Chengdu urban region and men's shoe manufacturing moved from the coast to the Chongqing peri-urban region), other clusters seem deeply embedded. The down cluster assessed in this paper is an example of a deeply embedded cluster. The Xiaoshan down cluster is highly specialized, and dominant both domestically and globally. As such, it is the venue of localized knowledge and distribution systems, which makes it difficult for competing clusters to arise. As design, marketing and distribution systems become more technologically advanced, this specialized knowledge conveys greater locational advantage. This is different from seemingly similar industries, such as shoe manufacturing, where the knowledge and distribution systems are much more dispersed.

Amenities can also be a factor, making the location more desirable to factory owners and managers. It is noteworthy that Hangzhou authorities have paid considerable attention to amenities in siting and designing the two new campuses of the HHTZ. For example, the Zhejiang Scientific and Technological Garden lies on the southern bank of the Qiantang River, opposite the Six-Harmony Pagoda.

(ii) In the case of firms more dependent for their competitiveness on technology than on just-in-time marketing, distribution and frequent design changes, there appears to be a tendency to fine-tune location decision-making, and to disconnect manufacturing spatially from other firm functions. This enables these firms to remain strong in innovation, the source of their competitiveness, but still benefit from lower manufacturing costs elsewhere. In the case study firms, lower-cost peri-urban Ningbo offered an attractive location for manufacturing high-tech products, but R&D and management functions remained in more cosmopolitan Hangzhou, with its greater prevalence of research and technical institutions. Technology and management interface needs often require locations that are justifiable in terms of innovation benefits, but which are too expensive and unaccommodating to production workers' costs of living to be competitive. In the case of Hangzhou's electronics instruments cluster, production activities have been spun off and relocated—not to western China or other remote locations—but instead to relatively nearby Ningbo, an established industrial city where costs are lower. This trend suggests that high-tech cluster firms want to keep their manufacturing functions and their R&D and management functions relatively close together.

(iii) In the Hangzhou case, there is clear evidence that the former peri-urban area (the Major Section) and the current peri-urban area are becoming much more livable. These peri-urban areas were once sterile in appearance, as are newly developing peri-urban areas in places such as Chongqing and Chengdu. In the Major Section, flooding

and drainage problems have been addressed, new higher-end housing has been built, attractive shopping complexes have sprung up, and substantial landscaping has been undertaken. Even in Xiaoshan District, where the urban landscape is starker, a much better environment is clearly in the making. Facilities such as large theaters have been constructed, landscaping is under way, and basic infrastructure, from road paving to curb construction, is rapidly proceeding. Another factor improving the quality of life in coastal peri-urban areas is greater access to city cores. This is the result of expressway connections—such as the new expressway connecting Xiaoshan District and Hangzhou’s city core—and improved public bus services between the city core and peri-urban areas.⁴¹

Local officials’ performance is usually measured according to quantitative indicators, such as a GDP growth and investment. They therefore have an interest in raising the quality of the local environment in order to attract higher levels of investment associated with capital intensive and higher value industries. Higher quality environments are also needed to attract and retain more highly skilled labor (talent), as the economy moves up the value chain. The causality goes both ways. As the labor force shifts to a higher share of technical workers and managerial staff, resident demands for higher quality local environments increase. Better environments, in turn, encourage people to settle in the area. Peri-urban residents in mature (coastal) areas perceive peri-urban areas as places not only to make money for a few years, but as places to settle down.

(iv) As the peri-urban migrant population ages, and a cohort of second generation migrants emerges, the effects of unequal access to social services related to *hukou* status becomes more serious. Long-term migrants tend to perceive themselves as locals, yet often cannot access services, or must pay more to access them. The lack of *hukou* status has knock-on effects that compound the problem—many migrants, for example, cannot obtain a housing mortgage. Obtaining a *hukou* is becoming easier, particularly in peri-urban districts, but it is still much more difficult than in comparable peri-urban areas in the west.

(v) The secondary data presented in Section 3 indicated that the outer peri-urban area in Hangzhou Municipality is stagnating, demographically, economically and in terms of investment. Such dynamics can be seen around most large Chinese cities. This hypothesis, presented in an earlier discussion paper in this series,⁴² appears further corroborated by the present paper’s research results.

Even within the inner peri-urban area, considerable “sorting out” has occurred in terms of the geographic vector of development. Growth is clearly to the east (Xiaoshan District), driven by the importance of the Hangzhou–Ningbo Corridor, with the northern inner peri-urban stagnating. Again, this dynamic is seen in other extended urban regions of China. Often, the extended urban region displays stronger growth in one direction than another; in some cases this occurs contrary to official plans, and is based on driving forces such as perceived status of an area, inter-city infrastructure corridors, and new airport locations. Development to the north, in the case of Beijing, and to the west, in the case of Chengdu, further exemplifies this dynamic. In other words, mature peri-urban areas become more differentiated in terms of the developmental strength of corridors or sectors radiating from the city core.

(vi) As indicated by data in Section 3, third stage peri-urbanization is less about dramatic inflows of migrants and rapid demographic growth, and more about continued movement of in situ human resources into more productive roles within maturing firms. Continued moderate migration feeds the labor system, both with production workers, and with skilled technical and managerial labor.

7. Policy Implications

Key policy areas that warrant further consideration with respect to peri-urban development include the following:

(i) The design of physical facilities, especially high-tech (science) parks, should take into account the future evolution of clusters that they host. Constructing overly large science parks in inner peri-urban areas may be a mistake if production spins off to more distant peri-urban areas, or even to remote regions as the cluster moves up the value chain. Inner peri-urban areas may become suburbia, or part of the contiguous city fabric, as in the case of the Major Section. These areas may have too much land reserved for one specialized use, especially in large contiguous plots, that could inhibit future urban development. In a way, the interspersed pattern of the Major Section is an advantage, leaving space for educational institutions, housing, shopping, and so forth, while still allowing the urban fabric to adapt as the area's role rapidly changes. This scenario is the norm in large Chinese urban areas.

(ii) Technology-based functions in peri-urban areas are highly dependent on research and academic linkages. To the extent that they are located nearby, the high value R&D and headquarters functions are likely to be maintained locally even as the firm's output grows rapidly, and manufacturing activities relocate. More sustainable peri-urban areas will likely be those that include research and educational facilities whose curricula and research are aligned with the needs of key clusters.

(iii) Coastal peri-urban areas are obviously maturing, becoming more livable. Their populations are also aging, which makes *hukou* reform more necessary. Second generation migrants—the children of migrants—are experiencing problems. They consider themselves part of the peri-urban community, but are not legally so.

(iv) Access to mortgages should not be related to *hukou* status. Otherwise, a situation can arise whereby long-term peri-urban residents cannot buy housing because of their *hukou* status, but at the same time cannot obtain a *hukou* because they do not own a house locally.

(v) As firms in peri-urban areas move up the value chain, amenities matter more. The reasons include: (a) to recruit and retain talented staff; (b) to please buyers who visit the area; and (c) to generate competitive and comparative advantage vis-à-vis competing areas that have lower cost structures. Amenities include the built environment, better connections with the core city, improved social and entertainment facilities, heritage and cultural resources, and better local shopping.

(vi) Based on current market and urban dynamics, inner peri-urban areas are more likely to have embedded clusters that are moving up the value chain fast enough to compete with lower cost regions. On the other hand, outer peri-urban areas lack endowments (higher educational facilities, urban amenities, access to producer and business services in sophisticated coastal core cities, etc.) to provide much advantage over more remote, lower cost regions. Thus, the outer peri-urban areas appear most vulnerable under increasingly competitive conditions. Care should be taken to avoid over-investing in outer peri-urban areas. (Settlements or nodes along major inter-city corridors may prove exceptions to this rule.) The fact that China's population will level off by mid-century, drastically reducing demographic pressures on urban regions, will exacerbate this dynamic.

(vii) The inner peri-urban area contains approximately half of the total cultivated land in the municipality. The 1991–2001 rate of loss of cultivated land in the inner peri-urban area was 4.78 times faster than its rate of population growth. This pattern is typical of large Chinese cities that grew up around highly fertile agricultural production. However, high capability land loss in inner peri-urban Hangzhou appears especially pronounced. (The ratio is more usually less than 2:1.) The outer regions of the municipality are also losing cultivated land, although the rate of loss has slowed considerably. Serious measures must be enforced to steer peri-urban development away from high capability farmland and to encourage compact development.

(viii) Opportunities for collaboration between peri-urban areas in coastal regions and western China exist. The fact that certain components of coastal clusters need to be spun off for cost reasons, while other components remain on the coast can provide a key impetus to such cooperation. The down cluster is an excellent example. Feather processing can be done most economically in the Chongqing or Sichuan areas, where the feathers originate and labor and other factors of production are less expensive. The actual production, and most important, design, international marketing, and distribution of the products are best done in the coastal area. The market will rationalize most of these relationships, but public policy support initiatives could speed the process.

(ix) As international competition becomes more intense in a deflationary East Asia, the efficiencies of long-established peri-urban clusters in coastal China—particularly in dealing with foreigners, relating design changes and production to demand on short notice, and sophisticated logistics—should not be underestimated. The role of logistics centers and functions will become more important and their development should be encouraged in mature peri-urban regions. This dynamic is already under way in Shenzhen.⁴³

(x) In the longer run, a more “level playing field” for investment in peri-urban areas across China may be desirable, not least to enforce better environmental regulations. Otherwise, unhealthy competition, leading to “race to the bottom” dynamics, could result. Creating a more level playing field would be a function of the national government.

Appendix 1. Firm Management Interview Check List

1. How did your firm get started making products in this line of business?
2. How do you intend to add value to your products (move up the value chain)?
3. What are the major problems faced by your firm in improving your business?
4. What are the advantages/disadvantages to being located in this cluster?
5. What, if any, significant links do you have with other firms nearby?
6. What, if any, links do you have with other support organizations nearby, e.g., technical schools, government organizations, industrial associations?
7. Does your firm offer opportunities for staff to upgrade their skills? If so, how?
8. Do your staff take training courses on their own? If so, what types of courses?
9. Are your employees registered with the local government? If so, who registers them? Does the firm do it, or do the employees do it themselves?
10. What are the major problems faced by your employees? (Local residents / Migrants)
11. Are you satisfied with government (all levels of government) support to your firm and industry?

Appendix 2. Employee Interview Questionnaire

Date: _____

Cluster: _____

Enterprise: _____

1.1 Did you grow up in this area (within 25 km)?

- (1) yes (2) no

1.2 If no, where?

- (1) within municipality (2) outside municipality, inside province
 (3) outside province (specify:_____)

2. How did you find this job?

- (1) friends in host town (2) friends in hometown (migrants only)
 (3) local people (4) government (5) newspaper (media)
 (6) sign (7) walk-in (8) placed by school after graduation
 (9) transfer between enterprises (10) other (specify:_____)

3. **Personal Data**

3.1 Sex: (1) male (2) female

3.2 Age Category:

- (1) 18 or younger (2) 19–23 (3) 24–29 (4) 30–39 (5) 40+

3.3 Education:

- (1) postgraduate (2) college (3) technical and vocational school
 (4) high school (5) middle school (6) primary school
 (7) not finished primary

3.4 Are you married? (1) yes (2) no

4.1 **Your position in this enterprise**

- (1) clerical (2) technician (3) production worker
 (4) support staff (5) short term contractor (6) salesperson

4.2 How long have you worked at this job?

- (1) <=6 months (2) 7–12 months (3) 1–3 years (4) >3 years

5. **Immediate Previous Job**

5.1 How long did you work at your previous job?

- (1) unemployed (2) <=6 months (3) 7–12 months
 (4) 1–3 years (5) >3 years

5.2 Where was your previous job located?

- (1) within 25 km (2) outside locality, inside municipality
 (3) outside municipality, inside province (4) in another province (specify:_____)

5.3 Type of work:

- (1) support staff (2) production worker (3) technician
 (4) clerical (white collar workers) (5) farmer (6) soldier
 (7) businessperson

5.4 Salary per month

- (1) higher than current job (2) lower than current job (3) almost the same

6. Job Before Previous Job

6.1 How long did you work at your previous job?

- (1) unemployed (2) <=6 months (3) 7–12 months
 (4) 1–3 years (5) >3 years

6.2 Where was your previous job located?

- (1) within 25 km (2) outside locality, inside municipality
 (3) outside municipality, inside province
 (4) in another province (specify:_____)

6.3 Type of work

- (1) support staff (2) production worker (3) technician
 (4) white collar worker (5) farmer (6) soldier
 (7) business person

6.4 Salary per month

- (1) higher than current job (2) lower than current job (3) almost the same

7. *Hukou* status

- (1) unregistered (2) registered (temporary) (3) local urban *hukou*
 (4) local rural *hukou* (5) hometown urban *hukou* (6) hometown rural *hukou*

8. Health Services

8.1 When you are sick, where do you *normally* obtain medical services?

- (1) pharmacy (2) clinic within enterprise (3) hospital (township)
 (4) private clinic (5) municipal hospital (6) don't use any services
 (7) other

8.2 Do you have health insurance? (1) yes (2) no

8.3 If yes, who provides it?

- (1) enterprise (2) host local government (3) home local government
 (4) personal insurance (5) social groups/organizations (e.g., labor bureau)

9.1 Are you taking part in any training program?* (1) yes (2) no

9.2 If yes, who delivers the training?

- (1) enterprise (2) local government (3) private institution/other
* e.g., informal distance learning, continuing education, adult education

10. What other local government services do you use? List (e.g., temporary residency center, travel center, labor bureau).

11. What other local government services would you like to receive? List.

12.1 In what type of housing do you live?

- (1) enterprise dormitory (2) dormitory provided by local government
 (3) board (4) rent housing unit
 (5) buy housing unit (6) free (with relatives, friends)
 (7) substandard structure (8) other

12.2 How much do you pay for housing per month? _____ Yuan per month

13. How do you normally travel to work?
 (1) walk (2) bicycle (3) motorbike (4) enterprise bus
 (5) public bus (6) taxi (7) private vehicle (8) enterprise car

14. **Travel to the City Center**

14.1 How often do you travel to the city center for business? _____times per month

14.2 For personal reasons? _____times per month

14.3 How do you travel to the city center (mode used most often)?

- (1) walk (2) bicycle (3) motorbike (4) enterprise bus
 (5) public bus (6) taxi (7) private vehicle (8) enterprise car

15. **What is your plan for the future?**

15.1 Do you plan to stay living in this community?

- (1) yes (2) no (3) uncertain

15.2 If no, where do you intend to move?

- (1) return to your hometown (2) move to another community (specify: _____)

15.3 If you want to move, what is your reason?

- (1) children's education (2) better job
 (3) reunite with family (4) better living conditions
 (5) job transfer (6) start own business
 (7) unfriendly local people (8) other (specify: _____)

16. What is your current salary? _____ Yuan per month

FOR MIGRANTS ONLY

(Hometown located 25 km or more away)

17. Why did you migrate to this location?

- (1) obtain job (2) higher pay (3) more interesting life
 (4) better social service (5) reunite with family (6) other (specify:_____)

18. If married, where did you meet your spouse?

- (1) here (2) hometown (3) other

19.1 Do you have children of school age? (1) yes (2) no

19.2 If yes, where does s/he study?

- (1) in hometown (2) in private school in host town
 (3) in public school in host town

19.3 If your children attend public school in the host town, do you pay an extra fee?

- (1) yes, specify amount: _____ Yuan (2) no

20. What is the amount of your remittance? _____ Yuan per year

Appendix 3: Firm Operations Questionnaire

Date: _____

Cluster: _____

Enterprise: _____

1. Location

1.1 Has your enterprise moved? (1) yes (2) no

1.2 If yes, where was original location?

(1) within the same cluster (2) outside cluster, inside town

(3) outside town, inside county (4) outside county

1.3 If within the same cluster, what was the reason for relocating?

(1) required by government (2) only way to obtain land

(3) access to good infrastructure (4) nearby related firms

(5) preferential policies (6) other (specify: _____)

2. Type of ownership:

(1) township enterprise (2) village enterprise (3) shareholding

(4) joint venture (5) private (6) HK and Macao investments

(7) other FDI (8) other type (specify: _____)

3. When did your enterprise start operating? Year: _____, Month: _____

4. Accumulated fixed assets as of December 2001: _____ 10,000 Yuan

Net fixed assets as of December 2001: _____ 10,000 Yuan

5. Total profits in 2001: _____ 10,000 Yuan

Taxes paid (local and national) in 2001: _____ 10,000 Yuan

6. Total number of staff by end of year 2001: _____. Of this total, how many:

(1) finished primary school: _____

(2) finished junior middle school: _____

(3) finished high school: _____

(4) finished technical or vocational schools: _____

(5) finished college: _____

(6) are technicians or engineers: _____

(7) are male: _____

(8) are younger than 20 years old: _____

(9) are 20–35 years old: _____

(10) are 36–55 years old: _____

7. Source of staff: number of staff that originates from:

(1) within a 25 km radius of the work site: _____

(2) outside 25 km radius, but within municipality: _____

(3) outside municipality but within province: _____

(4) outside province: _____

8. Do you provide a dormitory for staff? (1) yes (2) no
- 8.1 If yes, how many staff reside in the dormitory? _____. What percentage? _____%
- 8.2 Is the dormitory on factory property? (1) yes (2) no
9. The average salary is _____ Yuan per month, of which
- (1) Average salary for production workers is _____ Yuan per month
- (2) Average salary of technicians and junior office workers is _____ Yuan per month
- (3) Average salary of management and professionals is _____ Yuan per month
10. List the main products of the enterprise: _____
- _____
11. The major markets for your products (by value) are:
- (1) within municipality (2) outside municipality, inside province
- (3) outside province (4) outside China
- If (4), what percentage of products (by value) is exported _____ %
- List the major countries: _____
12. **Employment Benefits**
- 12.1 Which year did your enterprise start paying pensions? _____
- Cost of pension: _____
- 12.2 Which year did your enterprise start paying unemployment insurance? _____
- Cost of unemployment insurance: _____
- 12.3 Which year did your enterprise start providing health care insurance? _____
- Cost of health insurance: _____
13. Percentage of waste water generated that is treated: _____
14. From where does your enterprise obtain skills and technology?
- (1) other firms inside cluster (2) learning by doing
- (3) internal R&D (4) buy information from intermediary firms
- (5) government (6) educational institutions
- (7) business partners* (8) industry associations
- (*e.g., investor, client, partner)
15. Major difficulties experienced: _____
- _____
- _____
16. Desired policies, programs, or services from local government: _____
- _____
- _____
17. Development history of enterprise

Year	Staff (persons)	Output value (10,000 Yuan)	Investment (10,000 Yuan)	FDI (% of investment)	Land area (μu)
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					
2001					

Notes

¹ Zhejiang entry in Hutchings, G., *Modern China: A Companion to a Rising Power*, London: Penguin, 2000.

² Webster, D., *On the Edge: Shaping the Future of Peri-Urban Asia*, Discussion Paper, Urban Dynamics of East Asia Series, Stanford: Asia-Pacific Research Center, Stanford University, 2002 .

³ The peri-urbanization research team is a joint effort of the Asia-Pacific Research Center of Stanford University, and the Beijing Geography Institute, Chinese Academy of Science.

⁴ Webster, D., and Muller, L., *Challenges of Peri-urbanization in the Lower Yangtze Region: The Case of the Hangzhou–Ningbo Corridor*, Discussion Paper, Urban Dynamics of East Asia Series, Stanford: Asia/Pacific Research Center, Stanford University, 2002.

⁵ *Ibid.*

⁶ By 1995, collectively and/or privately owned industries, mostly at the township level, produced 6 percent of industrial output (Hutchings 2000, p. 490).

⁷ For details, see: Zhao, S.X., Webster, D., Zhang, T., Cai, J., *Chongqing Report*, Hong Kong: Hong Kong University, 2003 (prepared for Shui On Corporation).

⁸ For example, in February 2002, Wal-Mart set up a new independent sourcing unit, based in Shenzhen, to buy directly from Chinese factories. In China, average prices of consumer goods have declined by nearly 20 percent. Similar trends are occurring in Japan and in the United States. For example, in the United States, television set prices have fallen on average by 9 percent per year since 1998; sports equipment prices are declining at a 3 percent annual rate. For details, see Leggett, K. and Wonacott, P., “Burying the Competition”, *Far Eastern Economic Review*, October 17, 2002, pp. 30–5.

⁹ The PRD is recognized to as a special case. Generalizations are thus more applicable to the YRD.

¹⁰ Webster, D., Cai, J., Muller, L, and Luo, B., *Peri-Urbanization in Chengdu, Western China: From Third Front to Market Dynamics*, Discussion Paper, Urban Dynamics of East Asia Series, Stanford: Asia-Pacific Research Center, Stanford University, 2003.

¹¹ Webster, Cai, Muller, and Luo 2003.

¹² For further discussion of characteristics of the peri-urbanization process, see Webster 2002.

¹³ Census data are used instead of the official population registration statistics, as the latter data do not include nonregistered population in their population figures, and therefore undercount the number of people residing in the municipality. The Chinese 5th ten-year census is widely regarded as the most accurate census to date, based on the principle of counting people where they actually live.

¹⁴ However, it is not clear that the numbers presented in Table 1 present an accurate picture. It may be that much of the unofficial population, especially in the peri-urban areas, was undercounted in the 5th census.

¹⁵ The urban core corresponds to the old city proper, before a major amalgamation occurred in 2001. The five urban districts are Shangcheng, Xiacheng, Jianggan, Gongshu, and Xihu. As of 2001, the urban core also includes the newly formed Bingjiang District, which is composed of the three HHTZ zones. The Inner Periurban area consists of the two newly annexed districts, Xiaoshan to the east, and Yuhang to the north. The Outer Periurban comprises the three city-level counties in the municipality: Jiande City, Fuyang City and Lin’an City. The Rural comprises the two remaining counties, Tonglu and Chun’an. See Map 1.

¹⁶ Official migration statistics count only those migrants that have local *hukou* status, thus the figures do not accurately portray the migration dynamics in the region.

¹⁷ The 4th census was not based on the principle of counting people where they actually live.

¹⁸ In the census, migrants are defined as those who have arrived over the last five years.

¹⁹ 1 US dollar = 8.28710 RMB in 2002.

²⁰ Yuhang District is very agriculturally fertile. This may explain the economic and policy rationale behind the strong eastern direction of peri-urban development.

- ²¹ Prices range from 0.5 to 0.75 million RMB for a basic housing unit.
- ²² Depending on the value of the product, approval responsibility is mandated to different levels. The bottleneck in this case is at the municipal level.
- ²³ Feather processing firms in Tongliang County employ 1,000 people and the output value is US \$20 million per year.
- ²⁴ The cluster engages over 100,000 agents in western China to obtain the feathers.
- ²⁵ Interview by Douglas Webster with local officials, Tongliang County, Chongqing Municipality, October 29, 2002. Data supplied by the county.
- ²⁶ Local utility pricing is based on the true cost of provision, reflected in volume discounts.
- ²⁷ He is also vice chair of the China Chamber of Commerce for Import and Export of Textiles, Food, Machinery, and Electronic Products.
- ²⁸ Webster, Cai, Muller, and Luo 2003.
- ²⁹ Ironically, some newly arisen shoe clusters in Western China, such as the one in Chengdu, import leather materials from the coast, because leather tanning has been banned locally for environmental reasons.
- ³⁰ One hundred eleven employee interviews were conducted in the Hangzhou case—seventy-one in the high-tech electronic instruments cluster and forty in the down cluster.
- ³¹ There is a spatial differentiation in *hukou* criteria—it is much more difficult to obtain an urban *hukou* than a rural one. Within the urban category, it is more difficult to obtain a *hukou* for the municipal city proper than for a district or county level city. Furthermore, *hukou* regulations are more strict in coastal areas such as Hangzhou than in western areas, such as the Chongqing extended urban area, where it is easy to obtain county and district level city *hukous*. In terms of the Hangzhou City Proper *hukou* policy, the ease of application varies by education levels as follows: (a) masters degree holders are actively encouraged to apply; (b) bachelors degree holders from standard accredited universities (excluding distance education and night college degrees) are eligible for a *hukou* even without having a job; (c) technical school (polytechnic) degree holders, in fields that are in demand, are encouraged to apply, otherwise additional criteria have to be met; (d) migrants with only secondary education or less will have difficulty obtaining a Hangzhou City Proper *hukou*. In the Xintang Township, in Xiaoshan District, migrants are eligible for Xintang's rural *hukou* if they have worked at a steady job for at least three years and own a residence in the jurisdiction.
- ³² Of interest is the rise of local government-sponsored agencies from source areas that operate in host areas, passing information back to the source area and essentially encouraging out-migration from areas of high economic and employment stress. See Dolven, Ben, "Take Our Workers Please", *Far Eastern Economic Review*, February 27, 2003, pp. 24–6.
- ³³ Gender income disparity analysis does not control for experience and education.

³⁴ Based on research by the Beijing Geography Institute, many enterprises in the PRD only employ workers younger than age twenty-five (except for highly skilled positions). This forces workers to eventually change jobs, looking for work in other areas (e.g., the service sector), which exacerbates tensions between employees and employers.

³⁵ There is a pricing penalty on bridge tolls for vehicles with Xiaoshan licenses going into the urban core. Xiaoshan vehicles pay 20 RMB, whereas Hangzhou City vehicles pay only 10 RMB. This may reduce the affordability of frequent travel into the core for down cluster workers. The effect of the policy is to encourage localization of urbanization within the extended urban region.

³⁶ Two factors appear to be in play. The Major Section is much closer to the CBD than the down cluster, and the high-tech employees may be more urbane, and have more disposable income, and therefore use more of the services available in the CBD.

³⁷ The constraints associated with non-*hukou* status have been diminishing over time. Previously, one could not officially purchase subsistence items, such as food, without a local *hukou*. Now the concerns of non-*hukou* holders have shifted to higher order needs, such as schooling and home ownership.

³⁸ For example, most periurban counties and districts in Chongqing (the Western Corridor) will provide a *hukou* within six months if a person has a steady job and a place to live. In some local jurisdictions in the Chongqing peri-urban area, issuance of a county level urban *hukou* is almost immediate.

³⁹ There may be a methodological problem. Young, new migrants in Chengdu may have been too shy or felt it inappropriate to express to the interviewers the expectation that they would stay in the urban area.

⁴⁰ Transferable *hukou* status is new to China. Previously, *hukou* status could not be transferred to the spouse, and children were assigned the same *hukou* as the mother. Now, couples/children can assume the *hukou* of either spouse/parent.

⁴¹ Four bus lines run between downtown Hangzhou and Xiaoshan, with a bus running every eight minutes on each line during the day. Fares range from 2–4 RMB, depending on air conditioning and travel time (because of tolls incurred on the shorter routes).

⁴² Webster 2002.

⁴³ Frej, A., Christensen, M. et al., “Shekou Logistics Center”, in *Business Park and Industrial Development Handbook*, Washington: Urban Land Institute, 2001 (second edition), pp. 254–59.

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