

## GROWTH OF TERTIARY SECTOR IN CHINA'S LARGE CITIES

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**Abstract:** *This study interprets the fast-growing tertiary sector in China, especially in 84 large cities, as a result of sectoral labor transition. Large cities in China mostly relied on the tertiary sector for urban job growth during the period from 1990 to 1997 and are ahead of the country in the sectoral labor transition. The tertiary labor share in a large city is not only associated with the per capita income, but also with the urbanization level within the city limit, the per capita foreign direct investment, and the history and size of the city. Compared with other parts of the world, China is more similar to developed countries (with a time lag) than to developing countries in the path of the sectoral labor transition. Yet, the sectoral labor transition (and the growth of the tertiary sector specifically) in China has been strongly influenced by government policies.*

**Keywords:** tertiary sector, sectoral labor transition, China, large cities.

### Introduction

It is widely known that China since 1978 has been following a similar model to that of the "Four Little Dragons" in Asia to become a newly industrialized country. Not many people realize, however, that the tertiary sector in China has actually been growing faster on average than the secondary sector in both employment and output and as such a "tertiarization" process is emerging. Before 1978, the tertiary sector was discouraged by the government and was kept to the minimum only to support the reproduction and expansion in other sectors. Cities were transformed from "consumption" centers to "production" centers. This situation was only changed when the open-door policy and the economic reforms after 1978 unleashed the long-constrained demands for the tertiary sector. The government's attitude toward the tertiary sector took a favorable turn by issuing "a resolution to accelerate the development of the tertiary industry" in 1992 (State Statistical Bureau of China, 1999b). In the following year, state investment allocation to the tertiary sector exceeded half and continued to climb up to two thirds of the total state investment in the economy by 1998 (State Statistical Bureau of China, 2000). Although the tertiary sector is second to the secondary sector in output, it has surpassed the secondary sector in employment since 1994. The economic benefits of the tertiary sector in cultivating economic growth and its social benefits in providing job opportunities to urban youths, factory layoffs, and rural migrants have also been increasingly recognized.

Despite the increasing importance of the tertiary sector in China's economy and society, there is not much English literature discussing the sector in general, except for a couple of journalist's articles in Beijing Review (Li, 1998b; Liu, 1998). This level of research is inconsistent with the growing amount of studies on China in other subjects such as regional disparities (Fan, 1995; Wei, 1999b; Gu et al., 2001), foreign direct investment

(Eng and Lin, 1996; Wu, 2000), housing reforms (Wang and Murie, 1996, 1999; Li, 2000), migration (Fan and Huang, 1998; Huang, 2001), and manufacturing (Sit and Liu, 2000). This study attempts to complement research on China's economic development by examining the growth and spatial variation of the tertiary sector in China's large cities. It is based on the sectoral labor transition model in the development literature, in the hope that the model will help provide an understanding to the current and future growth of the tertiary sector in China. In return, the Chinese experience will enrich the development literature for guiding the growth of the tertiary sector in other developing countries.

### **Theoretical Context**

The division of economic activities into primary, secondary, and tertiary sectors came originally from Clark (1940) and Fisher (1939). It was proposed by Clark and well supported from the experience of developed countries (Fuchs, 1968; Bell, 1973; Kellerman, 1985) that economic development is accompanied by a shift in labor allocation from the primary to the secondary, and eventually to the tertiary sector. The increasing share of the labor force in the tertiary sector (the tertiary labor share, in short, for the rest of the paper) results from two differences among the three sectors. One is in labor productivity growth. The productivity in the tertiary sector increases at a slower pace than either the primary or the secondary sector. As technology advances and the economy develops, the decline in the tertiary employment is the slowest among three sectors to produce the same amount of supply as in the past. The other difference is in demand elasticity. The tertiary sector has the highest demand elasticity and so experiences the highest labor increase as income rises. As a result of this sectoral labor transition, a high per capita income is usually associated with a higher proportion of the labor force in the tertiary sector.

Most developed countries today have completed this sectoral labor transition and have reached the post-industrial stage in which most people work in the tertiary (or even quaternary and quinary) sector. Accompanying this process is deindustrialization. Manufacturing is moving out to developing countries. Developed countries experienced a relative decline followed by an absolute decline in secondary employment (Beyers, 1992).

The sectoral labor transition observed historically in developed countries is not exactly replicated in developing countries. As Pandit and Casetti (1989) pointed out, the tertiary labor shares in developing countries have been larger and growing more rapidly than the secondary labor shares even at early stages of development. Many developing countries, such as Egypt, have never had more secondary employment than tertiary employment. They attributed this deviation from the experience of developed countries to changes such as the adoption of capital intensive techniques in the secondary sector and the growth of urban informal services in the developing countries. Other factors such as the size and structure of international trade are also found to distort the relationship between the sectoral labor allocation and economic development (Pandit, 1986).

In a more recent study, Berry (1997) found that the positive relationship between the per capita income and the tertiary labor share was only maintained in high-income

countries and regionally in North America, Europe, and Asia. Between 1980 and 1990, a reversal of the relationship, i.e., a lower income associated with a higher tertiary labor share, was found in lower-middle- and low-income countries and regionally in Latin America and Africa. He considered the reversal reflective of failure of growth mechanisms in these countries. Amid a rapid population increase in the early stages of the demographic transition and marketization and modernization in the primary sector, the absence of rapid industrialization causes the low-income tertiary sector in the cities to become the employer of last resort. Many developing countries therefore have a completely different process of tertiary expansion from that in the developed countries. A study on the tertiary sector in four metropolitan regions in Brazil (Lavinás and Nabuco, 1995) also tied the high tertiary labor share to false urbanization and the booming of an informal sector.

A study on the sectoral structure of China's economic regions and provinces also found a discrepancy between the sectoral labor transition model and the Chinese experience (Wei and Dutt, 1995). The growth in labor productivity between 1978 and 1988 was found to be the slowest in the secondary sector and the fastest in the primary sector, different from what Clark suggested. The tertiary labor share in China was lower than the secondary labor share in 1988 and considerably lower than that in many developing countries. A three-phase unique Chinese model of sectoral labor shift was therefore established for China.

As economic reforms continued into the 1990s, the growth of the tertiary sector changed the sectoral labor allocation in China, especially in cities where state-owned enterprises became the national reform focus. Following the next section on data and methodology, the paper will discuss the growth of the tertiary sector in China, the recent shift in sectoral labor allocation, and the tertiary sector as a major source of employment in large cities. The tertiary labor share in large cities will then be analyzed, followed by the conclusions of the paper.

### **Data and Methodology**

*Fifty Years of New China* (State Statistical Bureau of China, 1999a) provides the data for examining the national trend of sectoral labor transition in China. The main data source for this research is *Fifty Years of New China's Cities* (State Statistical Bureau of China, 1999b), which provides almost all the data for city-related analyses.

The 84 cities included in this research had in 1998 at least 0.5 million non-agricultural population in the urban districts, a criterion used to define large cities in China. More like metropolitan areas or urban regions, these cities have urban districts and suburban counties within the city limits. The urban districts are the built-up areas while the suburban counties are mostly countryside embellished with a few small cities and towns.

In China, the primary sector includes agriculture, forestry, husbandry, and fishery (State Statistical Bureau of China, 1999b). The secondary sector includes mining, manufacturing, utilities, and construction. The rest of the industries are classified under the tertiary sector. Sectoral labor allocation in a city is measured by the percentages of total employment in primary, secondary, and tertiary sectors.

In addition to basic statistics such as percentages and growth rates, a growth index is designed in this research to measure the contribution of the tertiary employment increase to the urban job growth. Mathematically, the growth index is expressed as:

$$\text{Growth Index} = \frac{T_{97} - T_{90}}{S_{97} - S_{90} + T_{97} - T_{90}} \times 100 \quad (1)$$

where 90 and 97 are the beginning and ending years and T and S represent the employment in the tertiary and secondary sectors, respectively. For a few cities, the time periods are shorter to accommodate the changes in their city limits between 1990 and 1997. There are three critical points in the growth index. If the growth index of a city is above 100, there is a job loss in the secondary sector. Between 100 and zero, both secondary and tertiary sectors experience job growth, but the tertiary sector increases more than the secondary sector if the growth index is above 50, and vice versa. Below zero, there is a job loss in the tertiary industry or even in both the secondary and tertiary sectors, neither of which is true in any of the cities in this study.

A mixed regressive-spatial-autoregression model (Anselin, 1993) is used to explain the variation in the tertiary labor share, taking into consideration the spatial autocorrelation among the 84 large cities. Spatial autocorrelation commonly exists according to Tobler's first law of geography. Ignoring it often leads to serious errors in model interpretation (Griffith, 1987). The spatial autoregressive model in this study is expressed in double-log with both sides of the equation in natural logarithms, a format often used in sectoral labor allocation analyses (summarized in Pandit and Casetti, 1989). The dependent variable is the percentage of total employment in the tertiary sector in 1997 (PE3), multiplied by 100 to ensure a positive value after the natural logarithm. In addition to per capita gross domestic product in yuan (GDPPC), the following explanatory variables are included in the regression: (1) urbanization level (URB); (2) total population (POP), (3) per capita foreign direct investment (FDIPC), and (4) a dummy variable (OLD).

The urbanization level for each city is defined here as the percentage of total population engaged in non-agricultural activities in 1997, multiplied by 100. According to the development literature (Li, 1998), this variable is expected to have a positive relationship with the dependent variable. It is included as an explanatory variable to account for the variation in the spatial extent of the cities. Some cities are spatially large with plenty of rural areas within the city limits and therefore have low tertiary labor shares. At the other extreme, cities like Shanghai are highly built up and have high tertiary labor shares.

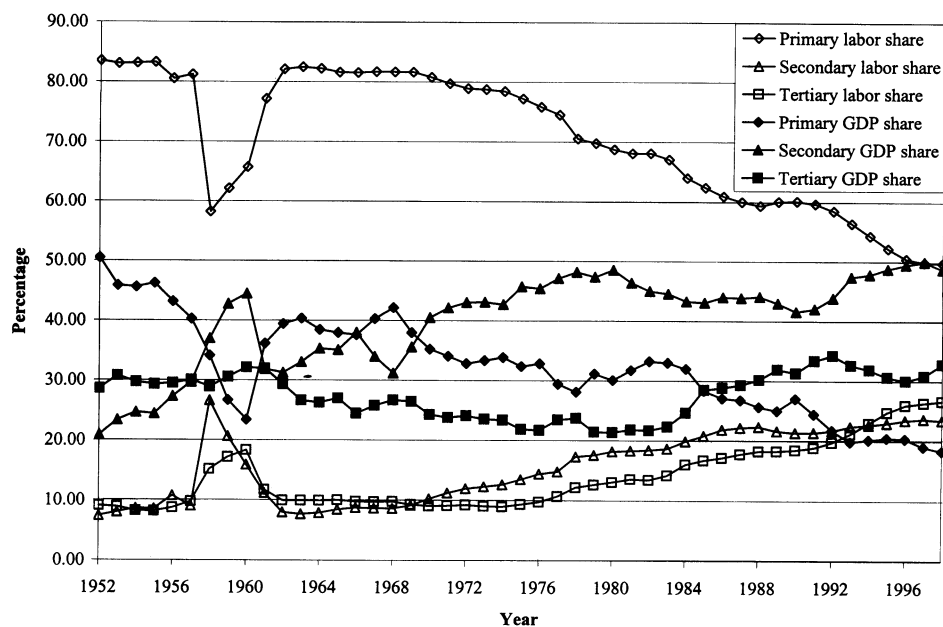
According to central place theory, a large city provides not only the low-order services a small city does, but also some high-order services a smaller city does not. Studies of urban basic/non-basic ratios using the economic base approach also found that in larger cities the basic sector is overshadowed by the non-basic component. Although the discrepancy between the non-basic sector and the tertiary sector is increasingly obvious in developed countries because of producer services, most tertiary activities in China are still non-basic. Therefore, the total population (in 10,000) variable is expected to have a positive relationship with the dependent variable. The per capita foreign direct

investment (FDI) is the average FDI (in dollar) among 1996, 1997, and 1998 divided by the total population of a city. A higher value for a city indicates a more open business environment and a more advanced urban economy. It should also have a positive relationship with the dependent variable.

The dummy variable OLD has a value of  $e(2.718)$  for cities which existed in and before 1950 and one for new cities set up after 1950. Expressed in a natural logarithm, the dummy variable (lnOLD) has a value of one for old cities and zero for new cities. New cities tend to lack the traditional business districts that old cities developed over a long period of time. Many new cities, such as Daqing and Yichun, were established as mining cities, in which the tertiary sector had, or still has, mainly a supporting role for the secondary sector. Even in new cities like Shenzhen, a high percentage of temporary residents (two thirds in Shenzhen according to Meng et al., 1999) do not help much in the local growth of the tertiary sector. This variable is expected to positively correlate with the dependent variable.

### Growth of the Tertiary Industry

Looking from either the beginning of the People's Republic of China or the year of 1978 when there were significant policy changes, all primary, secondary, and tertiary sectors in China expanded in absolute employment and output (State Statistical Bureau of China, 1999a). By 1998, the tertiary sector had 186.8 million jobs and 2.6 trillion yuans (about \$0.3 trillion U.S. dollars) in gross domestic product (GDP). It was second to the primary sector in employment and to the secondary sector in GDP (Fig. 1).



Source: State Statistical Bureau of China, 1999a.

Figure 1. Change in primary, secondary, and tertiary labor and GDP structures.

The relative change, or the structural change among the three sectors, was less straightforward besides continuous decline in the primary sector's shares of total

employment and GDP (Table 1). Growth shifted from the secondary to the tertiary sector over time. During the period between 1952 and 1978, the secondary sector gained substantially in both employment and output shares (9.9% and 27.3 percentage points, respectively). The tertiary industry gained only 3.1 percentage points in employment but lost 4.9 percentage points in GDP. Between 1978 and 1998, however, the tertiary sector gained 14.5 percentage points in employment and 9.1 points in GDP, much higher than the corresponding 6.2 and 0.6 in the secondary sector. As a result, the employment in the tertiary sector has passed that in the secondary sector since 1994 (Fig. 1).

**Table 1: Changes in primary, secondary, and tertiary employment and GDP structures.**

Percentage	1952	1978	1998	1952-78 change	1978-98 change	1952-98 change
Employment	100.0	100.0	100.0	0.0	0.0	0.0
Primary	83.5	70.5	49.8	-13.0	-20.7	-33.7
Secondary	7.4	17.3	23.5	9.9	6.2	16.1
Tertiary	9.1	12.2	26.7	3.1	14.5	17.6
GDP	100.0	100.0	100.0	0.0	0.0	0.0
Primary	50.5	28.1	18.4	-22.4	-9.7	-32.1
Secondary	20.9	48.2	48.7	27.3	0.6	27.8
Tertiary	28.6	23.7	32.9	-4.9	9.1	4.3

Source: *State Statistical Bureau of China, 1999a.*

Coupled with the constrained demands for services from the past and the new demands from rising income since 1978, the sectoral difference in productivity growth explains the higher tertiary employment than the secondary employment in China today. Different from what Wei and Dutt observed in China between 1978 and 1988, the productivity growth in the three sectors between 1988 and 1998 was completely reversed in order and showed the highest growth in the secondary sector and the lowest in the tertiary sector (Table 2). The progress in economic reforms was obviously responsible for the change. Economic reforms in China started in the rural areas in the early 1980s, which resulted in the highest productivity growth in the primary sector. After the rural success, economic reforms were extended into cities in the 1990s and significantly improved the labor productivity in the secondary sector. The highest productivity growth in the secondary sector and the lowest in the tertiary sector between 1988 and 1998 were exactly the same as what Clark described for developed countries. According to the experience of developed countries, the primary employment in China will eventually decline further to make the tertiary sector number one in employment.

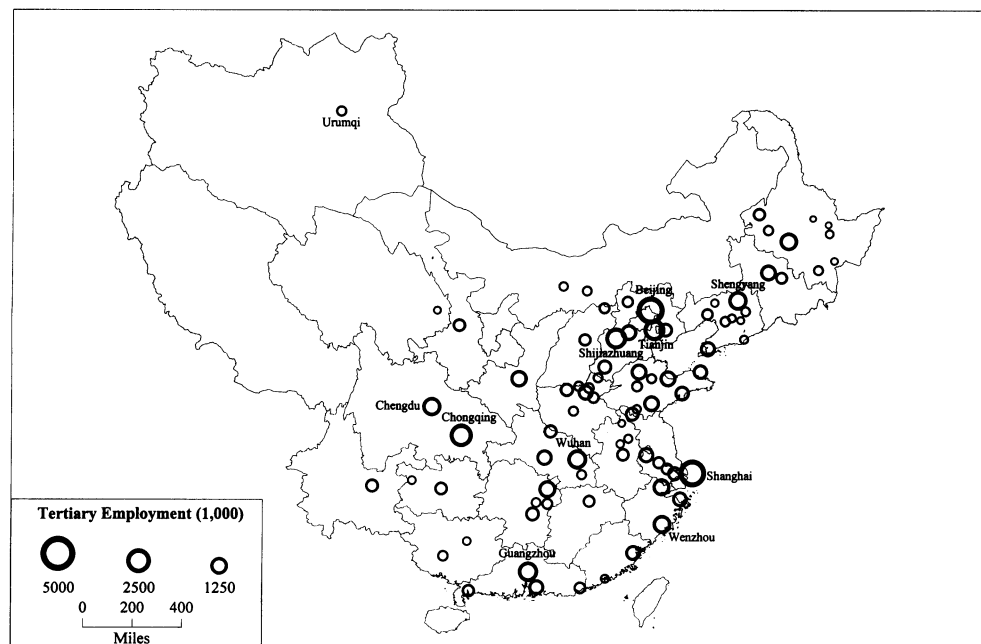
**Table 2: Sectoral productivity growth in China, 1978-1998.**

Sector	GDP (billion yuan)		Employment (million)		Yearly productivity growth (%)	
	1978	1998	1978	1998	1978-1988	1988-1998
Primary	101.84	1459.96	283.18	348.38	12.69	13.44
Secondary	174.52	3869.18	69.54	164.40	7.99	15.82
Tertiary	86.05	2610.43	48.89	186.79	9.94	11.90

Source: *State Statistical Bureau of China, 1999a.*

As shown in Fig. 1, the sectoral labor transition in China was quite different from most developing countries. Unlike typical developing countries, China had a long period of time (from 1970 to 1993) when employment in the secondary sector was more than that in the tertiary sector. In contrast to the lack of industrialization and growth mechanisms as Berry (1997) pointed out in typical developing countries, the secondary sector in China is still crucial to the economy and contributed to 48.7% of the GDP in 1998. Although China has to deal with the same issues as other developing countries, such as demographic transition, agricultural marketization and modernization, and urbanization pressure, the Chinese government had a positive impact on the sectoral labor transition by formulating population, urbanization, and economic policies. Population explosion in China was curbed by family planning policies, rural surplus labor was mostly absorbed by rural and township industries encouraged by the government, and there have been job opportunities in the cities from industrialization as a result of economic reforms and open-door policies. China's experience provides a good example for other developing countries going through the sectoral labor transition.

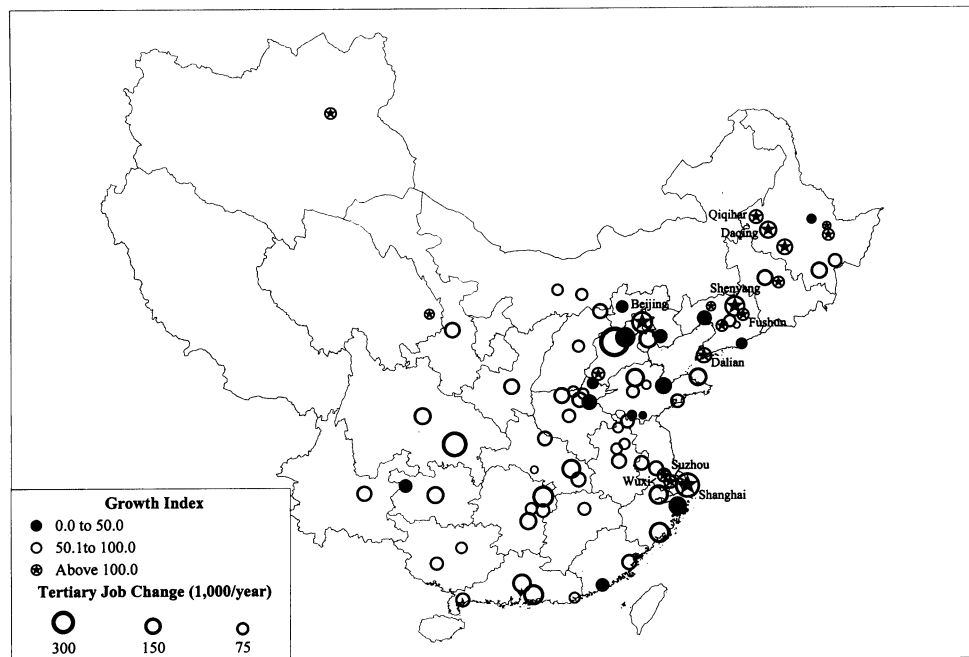
Almost three quarters of the tertiary employment in China are in cities, half of which (37.1% in 1997) in the 84 large cities being studied. Beijing being the highest and Shanghai the second highest, each had over three million jobs in the tertiary sector in 1997 (Fig. 2). Around these two cities are two obvious clusters of tertiary employment centers. Except Chongqing (the 3<sup>rd</sup> highest in tertiary jobs), Chengdu (9<sup>th</sup>), and Wuhan (7<sup>th</sup>) in the middle of the country, most large tertiary employment centers are located in coastal provinces. They range from Guangzhou (6<sup>th</sup>) in the south, Wenzhou (10<sup>th</sup>) and Shanghai in the central coast, Shijiazhuang (4<sup>th</sup>), Beijing and Tianjin (5<sup>th</sup>) in the north, to Shenyang (8<sup>th</sup>) in the Northeast.



Source: State Statistical Bureau of China, 1999b.

Figure 2. Tertiary sector's employment in 84 large cities in China, 1997.

The tertiary sector has become the main job provider in the cities. Fig. 3 maps the growth index, representing the contribution of the tertiary employment to the urban job growth in the 84 cities between 1990 and 1997. The average yearly increase in tertiary employment was also mapped in Fig. 3 as additional information to show the magnitude of the tertiary employment growth. All 84 cities increased in tertiary employment between 1990 and 1997. Only 14 out of the 84 cities had a growth index between zero and 50 and increased more in secondary employment than in tertiary employment. Fifty-two cities, mostly in the south, had a growth index between 50 and 100, which means that tertiary employment increased more than secondary employment.



Source: calculated from State Statistical Bureau of China, 1999b.

Figure 3. Growth index and yearly tertiary employment change in 84 large cities, 1990-1997.

The remaining 18 cities, interestingly, had a growth index above 100. They experienced job loss in the secondary sector between 1990 and 1997. These cities were mostly manufacturing or mining centers in the northeast, such as Shenyang, Dalian, Jilin, Qiqihar, Daqing, and Fushun. A few of them were scattered in North China, the Changjiang Delta, and the Northwest, including cities such as Beijing, Shanghai, Wuxi, and Suzhou. The reasons for this job loss in secondary employment could be many. First, many large cities such as Beijing and Shanghai changed the sectoral development priority from the secondary to the tertiary sector in the 1990s (State Statistical Bureau of China, 1999a; Han, 2000). Shanghai, for example, raised the share of total investment in the tertiary sector from 25.2% in 1981 to 35.8% in 1990 and further to



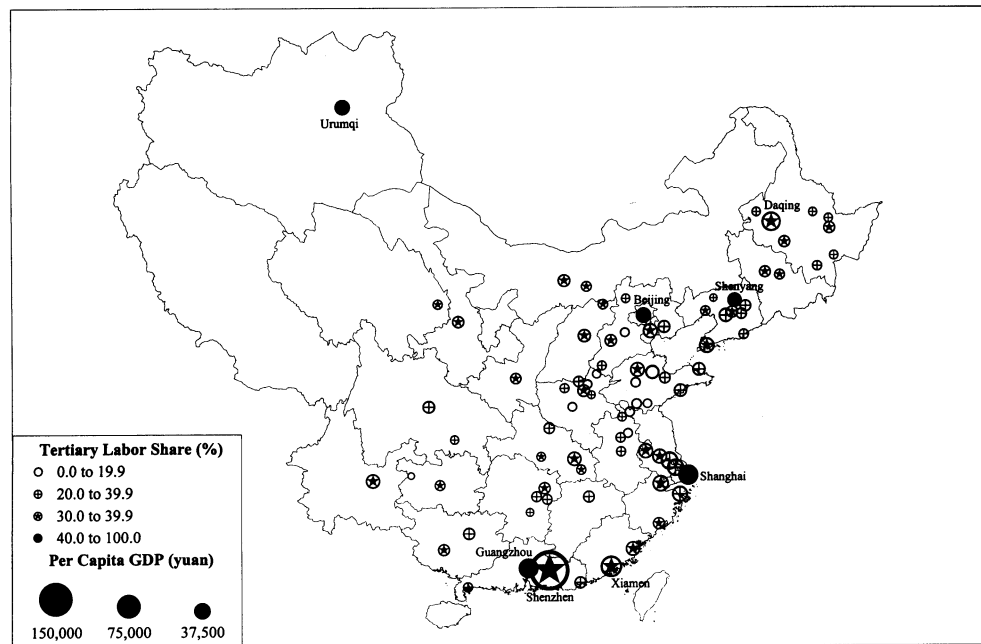
66.4% in 1998. Meanwhile, the investment share for the secondary sector declined from 72.7% in 1981 to 62.8% in 1990 and to 33.3% in 1998. Obviously, the sectoral labor transition in other countries provided guidance in the formulation of the sectoral development policy in these cities. Second, the south part of China was earlier than the north in the sequence of open-door policies (Gong, 1995). Cities in the south not only benefitted from the manufacturing jobs decentralized from Hong Kong and Taiwan (Leung, 1993; Sit, 2000) and gained in secondary employment as shown in Figure 3, but also attracted more FDI and became more competitive than those in the north. To some extent, the secondary employment in southern cities grew at the cost of the north. A study by Wu (2001), using Qinlin-Huai River as the dividing line of the north and the south, showed that the per capita FDI in the north was only half of that in the south between 1995 and 1998. The GDP per capita in the north was less than that in the south. Third, the north, especially the northeast, has traditionally had more large and inefficient state-owned enterprises than the south (Zhou and Yang, 1995; Wei, 1999a; Wu, 2001). The large-scale privatization of small and medium-sized state-owned enterprises in the 1990s caused massive layoffs in the secondary sector (Steinfeld, 1999; Putterman and Dong, 2000), which may well explain the secondary job loss in many northeastern cities. It is a natural process in the sectoral labor transition that the secondary sector discharges unneeded labor to improve productivity. Fourth, many mining cities in the northeast had very simple economic structure centered around their fossil or mineral resources. The oil and oil-related industries in Daqing, for example, accounted for about three quarters of its GDP in 1998 (Liu, 2000). As the nonrenewable resources are decreasing, the employment structures in these cities were forced to shift toward the tertiary sector and more advanced and less labor-intensive manufacturing. For whatever reasons, the secondary employment decline in these 18 cities is a sign of a labor structural shift from the secondary to the tertiary sector. While China as a whole is still far behind the stage when the secondary sector experiences absolute decline as observed in developed countries today, large cities in China are clearly ahead of the country in the path of the sectoral labor transition.

### **Tertiary Sector's Share of Total Employment**

Despite the tertiary employment growth in general and even secondary employment decline in some cities, the tertiary labor shares in the cities are still not high compared with cities or metropolitan areas in other developing countries (Lavinias and Nabuco, 1995; Morshidi, 2000). This is partially due to the nationwide low starting point of the tertiary sector in 1978 (Table 1) and that many rural areas and primary employment are included within the city limits. Only five cities had above 40% of their labor force in the tertiary sector in 1997. They are Beijing, Shanghai, Shenyang, Urumqi, and Guangzhou. Eleven cities had less than 20% of their labor force in the tertiary sector.

Is a higher per capita income associated with a higher tertiary labor share in China's cities, as suggested by Clark and supported in developed countries? Figure 4 shows that to some extent there is a correlation between the tertiary labor share and the per capita GDP. The five cities with above 40% tertiary share of total employment had relatively high per capita GDP. Shanghai and Guangzhou, for example, had the 3<sup>rd</sup> and 4<sup>th</sup> highest per capita GDP. Concentrated in areas between Shanghai and Beijing, cities with less than 20% tertiary share of total employment had relatively low per capita income. However, it is also obvious that Shenzhen (1<sup>st</sup> in per capita GDP), Xiamen

(2<sup>nd</sup>), and Daqing (5<sup>th</sup>) were only in the second highest group of tertiary labor shares. Per capital income was obviously not the only determining factor in the tertiary labor share in China's cities.



Source: State Statistical Bureau of China, 1999b.

Figure 4. Tertiary labor share and per capita GDP in the 84 large cities, 1997.

A double-log mixed regressive-spatial-autoregression model was used to identify the other factors explaining the variation in the tertiary labor share. Because of a high correlation of 0.8 between two explanatory variables of  $\ln\text{GDPPC}$  and  $\ln\text{FDIPC}$  and the problem of multicollinearity if both variables would be included in the same regression, two regressions were run. Only one of these two explanatory variables was included in each regression. The correlations among other explanatory variables are well under 0.5 and create no potential problem of multicollinearity. There is no other significant violation of statistical assumptions such as normality or homoskedasticity either.

The regressions were estimated using the maximum likelihood method in SpaceStat (Anselin, 1995). For each explanatory variable, the coefficient, the standardized coefficient (Z-value) and probability are listed in Table 3. The results for the two regressions are quite similar due to the high correlation between  $\ln\text{GDPPC}$  and  $\ln\text{FDIPC}$ . Regression II with  $\ln\text{FDIPC}$  is slightly better than regression I with  $\ln\text{GDPPC}$  because the former has a higher LIK (maximized log likelihood) and a lower AIC (Akaike Information Criterion) and SC (Schwartz Criterion).

Regression I can be expressed as:

$$\ln PE3 - (0.4719 \times W \times \ln PE3) = (-3.6305) + 0.3080 \times \ln URB + 0.1088 \times \ln GDPPC \\ + 0.1219 \times \ln OLD + 0.0691 \times \ln POP + \varepsilon \quad (2)$$

and regression II can be expressed as:

$$\ln PE3 - (0.5252 \times W \times \ln PE3) = (-2.8032) + 0.3311 \times \ln URB + 0.0390 \times \ln GDPPC \\ + 0.0923 \times \ln OLD + 0.0628 \times \ln POP + \varepsilon \quad (3)$$

where  $W$  is the simple inverse distance matrix and  $W \ln PE3$  the spatial autocorrelation in the dependent variable. Since the spatial autoregressive coefficient is positive in both models, there was positive spatial autocorrelation in the tertiary labor shares of the 84 large cities. The left side of the equations is the dependent variable after the spatial autocorrelation of itself ( $W \ln PE3$ ) has been controlled for.

In both regressions, the  $\ln URB$  variable had the highest standardized coefficient (Z-value) among all explanatory variables. This is equivalent to say that the urbanization level (URB) within the city limit, or the percentage of total population in non-agricultural population, had the most influence on the variation in the tertiary labor share.

**Table 3: Regression analyses of the tertiary sector's share of total employment in large cities.**

Regression I				Regression II			
Variables	Coefficient	Z-value	Probability	Variables	Coefficient	Z-value	Probability
$\rho$	0.4719	2.1645	0.0304	$\rho$	0.5252	2.3940	0.0167
Constant	-3.6305	-9.8563	0.0000	Constant	-2.8032	-7.8673	0.0000
$\ln URB$	0.3080	5.3072	0.0000	$\ln URB$	0.3311	6.0663	0.0000
$\ln GDPPC$	0.1088	3.0951	0.0020	$\ln FDIPC$	0.0390	3.1035	0.0019
$\ln OLD$	0.1219	2.6496	0.0081	$\ln OLD$	0.0923	1.9606	0.0499
$\ln POP$	0.0691	2.0318	0.0422	$\ln POP$	0.0628	1.8137	0.0697
$R^2$		59.60%		$R^2$		59.62%	
Adjusted $R^2$		59.63%		Adjusted $R^2$		59.66%	
LIK		35.99		LIK		36.01	
AIC		-59.98		AIC		-60.03	
SC		-45.39		SC		-45.44	

The second highest standardized coefficient goes to  $\ln GDPPC$  in regression I and  $\ln FDIPC$  in regression II. In addition to what Figure 4 shows, it is statistically proved in regression I that there was a significant and positive relationship between the per capita GDP and the tertiary labor share, similar to what Clark described. In China, a higher per capita GDP was often found in cities that were more open and attracted more

FDI. Shenzhen and Xiamen, for example, are two of the four special economic zones first open for FDI in 1980. These two cities had the highest per capita GDP and FDI in 1997. The per capita GDP in Shenzhen was almost four times of that in Shanghai, the 3<sup>rd</sup> highest in per capita GDP. As the government in China gradually opens up the tertiary sector for FDI (Liu, 1998; Li, 1998a), the impact of per capita FDI and per capita GDP on the tertiary labor share will only be more profound in the future.

In both regressions, the variables of LnOLD and LnPOP had the expected positive relationship with the dependent variable. Cities, which existed before 1950, have had a long history and tend to have higher tertiary labor shares. To a great extent, this variable explains why new cities such as Shenzhen and Daqing were not in the highest group of tertiary labor shares despite their high per capita GDP (Fig. 4). Conforming to the central place theory and economic base theory, larger cities in general had higher tertiary labor shares than smaller cities.

The regression results are good, but could have been better if all needed data were available. For example, the tertiary sector's share of total fixed-asset investment in each city is an ideal indicator of the city government's influence on tertiary development and could be a very good explanatory variable for the tertiary labor share. The data, however, are not available for the 84 large cities studied. The statistical books available have only the total fixed-asset investment in all sectors, not specific to the tertiary sector. The regression models built are thus limited by data availability.

### **Conclusions and Discussions**

The tertiary sector in China grew substantially in the period of 1978 to 1998, especially in the 1990s. The sector accounted for 26.7% of the total employment in 1998 (up from 12.2% in 1978) and 32.9% of the GDP. The tertiary employment exceeded the secondary employment since 1994, being second only to the primary employment. The rapid growth of the tertiary sector in the past two decades is a compensation for the insufficient tertiary services before 1978, but more importantly, a result of the economic progress brought about by the economic reforms, open-door policy, and one-child policy since 1978. These policies substantially increased the labor productivity in the primary and secondary sectors, causing labor shifts from these two sectors to the tertiary sector. Meanwhile, income rise as a benefit of these policies raised the demand for tertiary services and therefore for tertiary employment. Therefore, the growth of the tertiary sector is part of the sectoral labor transition recently accelerated by government policies.

In the 84 large cities studied, the tertiary sector has become the major source of job growth. In some large cities, mostly in northern China, the tertiary sector became the only source of urban job growth due to the absolute decline of the secondary employment between 1990 and 1997. Large cities in China are clearly ahead of the country in the sectoral labor transition.

It is generally true in China's large cities that a higher per capita income is associated with a higher proportion of the labor force in the tertiary sector. In addition to per capita income, this study found that other factors, such as the urbanization level within a city limit, the per capita FDI in the city, the history and the population size of the city,

affect the tertiary labor share as well. Opening to more FDI should be an effective tool in increasing the tertiary labor share in China's large cities, an experience which possibly could be extended to a greater spatial extent such as to other developing countries.

Compared with other parts of the world, China is more similar to developed countries (with a time lag) than to developing countries in the path of the sectoral labor transition. As shown in this research for large cities in China, there is a positive relationship between the per capita income and the proportion of the labor force in the tertiary sector, similar to what Clark observed in developed countries. A reversal of the relationship was found in many developing countries (Berry, 1997). While many developing countries have never had more secondary employment than tertiary employment, China had a long period of time when secondary employment was more than the tertiary employment, similar to developed countries in the late 19th and early 20th century. Most importantly, the growth of the tertiary sector, as a part of this sectoral labor transition, is associated with labor productivity growth, especially in the primary and secondary sectors, and with rising income in China. In contrast, the growth of the tertiary sector in many developing countries was a result of failure in the rural areas, false urbanization, and an oversized informal sector.

However, unlike developed countries, the sectoral labor transition in China has not been a natural process.<sup>1</sup> It was a process controlled and manipulated by the Chinese government. Because the different times in which developed and developing countries went (or are going) through the sectoral labor transition, "tertiarization" without much industrialization in many developing countries seems to be a more natural, but disadvantageous, process in today's world environment. For example, the availability of capital-intensive techniques in the secondary sector today substantially reduces the amount of labor involved in many industrial productions, while globalization makes it possible to obtain manufactured products from the world market without industrialization in the local areas. The Chinese government before 1978 avoided some disadvantages of the premature "tertiarization" by pursuing forced-draft industrialization and counterurbanization at the cost of efficiency. After 1978, government policies in economic reforms, in opening the country to foreign investment, in developing rural and township industries to absorb rural surplus labor, and in population control helped to put the "tertiarization" process on the right track. The central government played a fundamental role in the growth of the tertiary sector and the sectoral labor transition in China.

Of course, China is still in the early stage of "tertiarization," with the majority of the activities being low-order services. A long road lies ahead of the sectoral labor transition in China to further reduce the primary labor share and develop high-order services. Can China continue to follow the path of developed countries in sectoral labor transition to eventually develop quaternary and quinary services, or will it turn to rely on low-order and/or informal services to provide jobs to displaced labor from the primary and secondary sectors? This is an important question and a challenge to the Chinese government amid an increasingly market-oriented economy.

This is a preliminary study intended to lay a background for more research focusing on the growth of the tertiary sector in China's cities. Future research on the subject will

explore the internal structure of the tertiary sector and the impact of the growth of the sector on the spatial structure of the cities in China.

### Footnotes

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