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BASIC FEATURES AND TRENDS OF THE ECONOMIC BASE OF BEIJING

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ABSTRACT: In China, systematic studies on economic base of a single city are very weak. Based on the 1990 census and relevant statistics during 1990 - 1994, a comparative study is conducted on Beijing, Shanghai and Tianjin. The major conclusions are as follows: (1) Beijing is not only the national political and cultural center, but also the national economic center, viz the commercial service center and the low water-consuming, light polluting, external economy-typed and knowledge-intensive manufacturing industrial center, which is appropriate for Beijing's comparative advantage. (2) The high water-consuming, heavy polluting and regional market-oriented industry is overdeveloped as far as Beijing's scarce water and other natural resources are concerned. (3) Beijing's industrial base is smaller, more regional market-based, and the service base is more diverse, larger and more national market-based than Shanghai's and Tianjin's. (4) With the development of socialist market economy and implement of sustainable development strategy, the external economy-typed and knowledge-intensive manufacturing industry with lower input of water and less environmental pollution, and information-intensive service industries will centralize further, and the industry with higher input of water and/or severe environmental pollution will decentralize.

KEY WORDS: Beijing, Economic base, Economic center, World city

1 INTRODUCTION

Beijing is the national political and cultural center and the second largest city, and occupies a decisive position for China to take the initiative in future globalization and regional integration. This paper applies the classic economic base method to comparative study on Beijing, Tianjin and Shanghai. The fundamentals read as follows:

1) Basic sector: if $LQ_i > 1$, the i-th type of economic activity is basic sector; conversely, if $LQ_i <$ or $= 1$, then non-basic sector. The computing formula is:

$$LQ_i = \frac{E_i/E}{N_i/N}$$

where LQ_i and E_i are the location quotient of and the scale of the i-th type of economic activity in study region, E is the total scale of economic activities in study region, N_i and N are respectively the total scale of the i-th type of economic activity and the total scale of all economic activities in the whole regional system.

Based on the whole country and the national urban system respectively, We computed two classes of location quotients of Beijing, Tianjin and Shanghai. If the first $LQ > 1$ but the second $LQ < 1$, then the sector is defined regional base; if the second $LQ > 1$, then the sector is defined national base. To take into account (1) regional variation of consumption, although the second LQs of coking products, gas and coal products, and furniture sectors are larger than 1, they are defined regional bases; (2) difference among labor productivity of different cities' financial institutions, although the second LQ of Beijing's finance and insurance is close to 1, while Shanghai's is only 0.75, the finance and insurance is defined national

base.

2) Basic scale: namely the absolute scale of basic activity in every sector. It shows as follows:

$$S_i = \begin{cases} 0 & \text{if } LQ_i \leqslant 1 \\ (\frac{E_i}{E} - \frac{N_i}{N})E = (1 - \frac{1}{LQ_i})E_i & \text{if } LQ_i > 1 \end{cases}$$

where S_i is the basic scale of the i - th sector in study region.

By adding up S_i in every sector, we can get the total basic scale in study region:

$$\sum S_i = \sum (1 - \frac{1}{LQ_i})E_i$$

3)Basic proportion, namely the proportion of basic scale to the scale of basic sector:

$$P_i = \frac{S_i}{E_i}$$

To seek accuracy and comparability, this paper is based on employment data by sector and branch in the 1990 census and supplemented by relevant statistical data during 1991 - 1994. The study area is Beijing proper, but substituted by administrative region when change of the bases during 1990 - 1994 is studied.

2 SCALE, GRADES AND TYPES OF BEIJING'S ECONOMIC BASE

2.1 Industrial Base

1)Scale: The scale of Beijing's industrial base is 898.0 thousand persons, only 45.1% of Shanghai's, 75.9% of Tianjin's. Only 11 sectors of Beijing are larger than Tianjin's, among them furniture and printing are 3.5 times the scale of Tianjin's; only 8 sectors are larger than Shanghai's, among them furniture is 16 times as large as Shanghai's; most of other sectors are smaller than Shanghai's (Table 1).

2)Basic proportion: Here refers to the percentage of basic employment to total employment. The basic proportion of Beijing's industry is 61.0%, namely about 61 persons per 100 workers are serving external market. The figure is lower than Tianjin's 72.4% and Shanghai's 77.2%, which indicates Beijing's more internal market-oriented industry. However, some industrial sectors such as beverage, sewing, furniture, printing, handicraft article and building materials are more external market-oriented.

3)Grades: Table 1 shows regional and national bases of Beijing. The latter are mainly low water-consuming and light-polluting industries. Beijing's regional base is 3.7 times and 6.9 times as large as Tianjin's and Shanghai's, while the national base is only 44% and 24% of Tianjin's and Shanghai's. Obviously, Beijing is a more regional market-oriented industrial center.

4)Structure: According to Table 2, 1) Beijing's light - polluting and low and middle water-consuming industrial base is 81.9% of the total, 3.1 percents higher than Tianjin's 78.8%, 1.4 percents lower than Shanghai's 83.4%, while the heavy-polluting and high water-consuming base is 15.7%, lower than Tianjin's 18.4% but higher than Shanghai's 14.8%. So compared to Shanghai's, Beijing's industrial base is unfavorable to environmental protection and water conservation and not fit for Beijing's scarce water and environmental resources; 2) Beijing's light polluting, low and middle water-consuming and knowledge-intensive industrial base is 49.6% of the total, 10.7 percents and 2.3 percents higher than Tianjin's 38.9% and Shanghai's 47.3%, which reflects that Beijing is the knowledge-intensive national cultural center; 3) Beijing's light polluting and low water-consuming non-knowledge intensive industrial base is 22.7% of the total, 5.1 percents and 9.7 percents higher than Tianjin's and Shanghai's, which reflects Beijing's comparative advantage in the external economy-typed industries such as printing and sewing.

2.2 Service Base

Analysis reveals that, of 30 service sectors Beijing has 28 national bases, while Shanghai has 26, Tianjin has 23; Beijing's service base scale is 2.30 and 1.39 times as large as Tianjin's and Shanghai's respectively, and basic proportion is 8.0 and 4.9 per-

cents higher than Tianjin's and Shanghai's, These all indicates that Beijing is a larger, more external market-oriented and comprehensive service center.

To identify the position of all kinds of services

Table 1 Scale and proportion of Beijing's industrial bases and their times over Tianjin's and Shanghai's

Item	Scale (10 000 persons)	Tianjin's (%)	Shanghai's(%)	Proportion(%)	Tianjin's(%)	Shanghai's(%)
Total industrial base	89.8	0.45	0.76			
Regional base	43.0	3.70	6.94			
National base	46.8	0.44	0.24			
Coal*	1.3	—	—	25.9	—	—
Leather and Furs*	0.7	0.58	0.38	45.1	0.71	0.68
Furniture*	1.3	4.68	16.37	54.9	2.06	7.42
Timber*	0.4	0.52	0.53	31.9	0.47	0.69
Printing**	4.9	3.52	1.52	84.5	1.28	1.10
Beverage*	0.6	1.77	1.99	38.0	1.25	1.86
Building Materials*	5.1	1.75	1.80	50.1	1.19	1.47
Handicraft Article**	2.0	1.42	2.78	59.8	1.05	1.89
Feed**	0.2	1.36	—	54.2	0.96	—
Sewing**	5.2	1.45	1.01	65.6	1.05	1.03
Coking*	1.6	1.09	1.07	82.8	0.96	1.02
Transportation Equipment**	10.6	1.40	0.81	81.1	1.02	0.98
Instruments and Meters**	3.5	1.66	0.51	86.5	0.10	0.94
Electric Equipment and Machinery**	6.2	0.82	0.46	75.1	0.91	0.87
Electronic and Telecom**	8.0	1.45	0.63	87.4	1.02	0.96
Textile Industry*	2.4	1.15	0.07	26.1	0.35	0.32
Stationery, Educational and Sports Goods**	1.7	0.88	0.35	78.6	0.93	0.87
Pharmaceuticals*	1.5	0.75	0.53	71.5	0.89	0.89
Food*	3.1	0.74	0.68	50.0	0.79	0.88
Machinery*	14.5	0.68	0.33	67.9	0.85	0.79
Chemical Fibers*	0.2	0.64	0.18	51.6	0.79	0.63
Plastic*	1.3	0.64	0.41	54.2	0.77	0.74
Ferrous Metals*	2.2	0.61	0.16	57.3	0.78	0.65
Petroleum Processing*	0.5	0.51	1.13	60.6	0.76	1.04
Rubber*	1.4	0.40	0.37	67.6	0.77	0.80
Metal Products**	4.4	0.40	0.44	65.3	0.76	0.82
Chemical Products*	3.9	0.38	0.48	56.5	0.69	0.79
Nonferrous Metals*	0.2	0.34	0.08	30.0	0.50	0.36
Paper*	0.8	0.26	0.38	37.9	0.50	0.63

Note: (1)"—"indicates non-basic sector in Tianjin or Shanghai.

(2)Computed from "China Census Data, 1990" (Vol.2) Table 6-1 and Table 6-2.

(3) * indicates regional base, * * indicates national base.

Table 2 Structure of industrial bases*

Classification (Pollution// Water Consumption //Intensive Type)	Beijing		Shanghai		Tianjiang	
	10000 persons	%	10000 persons	%	10000 persons	%
Light// Low// Knowledge	43.1	48.0	91.4	45.9	44.1	37.3
Light// Low// Non-knowledge	20.3	22.7	26.0	13.0	20.9	17.6
Light// Middle// Knowledge	1.5	1.6	2.8	1.4	1.9	1.6
Light// Middle// Non-knowledge	8.6	9.6	46.0	23.1	26.3	22.2
Light// High// Knowledge	0.5	0.5	0.4	0.2	0.9	0.8
Light// High// Non-knowledge	0.6	0.7	0.3	0.2	0.3	0.3
Severe// Low// Knowledge	0.2	0.2	2.7	1.4	0.6	0.5
Severe// Middle// Non-knowledge	1.3	1.4	0.0	0.0	0.0	0.0
Severe// High// Knowledge	7.9	8.8	24.5	12.3	15.8	13.3
Severe// High// Non-knowledge	5.9	6.5	5.0	2.5	6.0	5.0
Salt Mining	–	–	–	–	1.6	1.3
Total	89.8	100.0	199.1	100.0	118.4	100.0

* Knowledge-intensive industries have higher proportion of scientific and technical personnel than total average; conversely, non-knowledge intensive industries have lower proportion. Low, middle and high water-consuming industries consume $<50m^3$, $50-100m^3$, $>100m^3$ water per 10000 yuan output value respectively. Light-polluting industries discharge less waste water, waste gas, waste residue per 10000 yuan output value than total average; conversely, heavy-polluting industries discharge more. Data are from (1)"China Census Data, 1990"(Vol. 2), (2)"China Industrial Statistics, 1993", (3)"Beijing Statistical Yearbook"pp. 205, (4)"China Environmental Statistics Yearbook, 1993" pp. 74, 76-77.

clearly, we roughly divided service activities into politics, culture and business. According to Table 3, Beijing is:

1) the single national political center. Beijing's government and party agencies are both national bases, of which the scale are 166 and 4 thousand persons and the basic proportions are 72.6% and 47.0% respectively, while Tianjin's and Shanghai's are not. Corresponding to the position as the capital, Beijing is the single national political center.

2) the largest and the most comprehensive national cultural center. Beijing's cultural activities are all national bases, total scale of which is 1.8 times that of Shanghai, 3.2 times that of Tianjin. Therefore, Beijing is the largest and the most comprehensive national cultural center, while Shanghai is the second largest cultural center, Tianjin is only the cultural center in Northern China.

3) the largest national commercial service center. Beijing's commercial service base is 1.16 and 1.99 times as large as Shanghai's and Tianjin's. Beijing is the largest national engineering service center, real estate management center, information service center, business management center, financial center, airway and highway transportation center, residential service center and the second largest national commercial center only inferior to Shanghai.

However, does the commercial service center's position correspond to Beijing's capital function? We can say "yes". Generally, capital supplies services to the nation by way of cross-border supply, consumption abroad, commercial presence and presence of natural persons. In the process, labor and capital are inputted, while information and human resources are produced. The concentration of input and output may develop a capital into the national economic center, especially the commercial service center. However, the transformation from possibility to reality will be finally decided by the composition and scale of capital's function, namely:

Table 3 Scale and proportion of Beijing's service bases and their ratio to Tianjin's and Shanghai's

Item	Scale			Basic Proportion		
	10000 persons	Shanghai's(%)	Tianjin's(%)	%	Shanghai's(%)	Tianjin's(%)
Total Scale	194.7	138.9	230.3			
Regional Base	0.0	0.0	0.0			
National Base	194.7	143.6	266.0			
1 Politics & Culture	**73.9**	**207.3**	**311.2**			
1.1 Politics	17.1	378.0	296.0			
Government Agencies	16.6	368.4	290.2	72.6	182.4	134.9
Party Agencies	0.4	–	1271.8	47.0	–	566.3
1.2 Culture	56.8	182.5	316.2			
Education	18.3	422.9	282.5	66.7	124.0	122.2
Science & Research	17.6	265.8	583.9	96.0	107.7	114.7
Sports & Health Care	9.7	114.3	222.9	73.7	106.5	119.8
Culture & Arts	7.0	248.1	764.3	90.3	115.5	145.6
Social Organizations	3.5	243.3	360.5	84.2	125.7	128.9
Broadcasting & TV	0.6	597.4	–	78.7	247.5	–
2 Commercial Service	**120.9**	**115.6**	**198.8**			
2.1 Engineering	35.2	161.4	232.0			
Civil Engineering	28.3	167.9	232.0	88.4	109.7	109.5
Circuit, Pipeline & Equipment Installation	3.6	85.8	199.1	88.3	99.2	107.6
Reconnaissance & Design	3.3	422.9	282.5	92.8	125.6	108.7
2.2 Real Estate Management *	5.5	119.6	392.9	87.3	104.4	124.7
2.3 Information Service	7.4	202.9	188.6			
Polytechnic Service	4.5	338.0	504.6	95.2	111.0	113.3
Post & Telecommunications	1.9	106.0	286.6	74.7	102.6	132.0
Consulting	9.5	202.1	311.4	93.0	101.9	115.7
Geological Exploration & Prospecting	0.0	–	0.0	0.0	–	0.0
2.4 Business Management	10.5	239.1	358.4	89.4	116.9	119.7
2.5 Finance & Insurance	1.7	167.0	203.8			
Finance	1.6	166.2	201.7	54.9	135.6	125.3
Insurance	0.1	183.7	254.4	48.9	125.4	145.1
2.6 Transportation	7.6	286.1	264.2	64.5	179.7	132.2
Railway * *	5.1	548.9	293.6	67.3	270.3	137.1
Highway * *	1.9	175.5	200.0	53.1	145.1	119.9
Airway * *	0.7	102.9	304.3	87.5	102.9	114.1
2.7 Commerce	29.1	82.0	132.7			
Wholesale & Retail	20.2	85.8	199.1	59.3	94.6	104.0
Catering Trade	4.5	103.9	197.7	69.9	104.0	117.3
Supply & Marketing	2.2	85.2	158.4	73.3	98.1	108.1
Storage	2.2	67.6	56.9	78.8	93.9	88.1
2.8 Social Service	13.9	166.6	538.0	83.7	113.1	152.5
2.9 Public Facilities	9.2	73.5	152.7	89.8	97.9	101.9
2.10 Transportation Subsidiary * *	0.9	16.9	41.5	41.9	53.0	59.3

* Computed from employment data in "China Statistical Yearbook, 1995"pp. 86 – 87.

* * (1)Computed from staff and workers in state-owned transportation units in pp. 465 and employment data in pp. 86 – 87, "China Statistical Yearbook, 1995". Other data are computed from relevant data in "China Census Data, 1990" (Vol. 2)pp. 366 – 383. (2)On the whole, Beijing's transportation sector is not national base because of lack of waterway. So we subdivide transportation sector and list waterway and transportation subsidiary individually.

1) whether the capital is a pure political center or a political and cultural center. A pure political center has a small population and little advantage of human capital and information, while the consolidation of political center and cultural center will greatly enlarge the population, improve the quality of human capital and information. For instance, none of pure political centers such as Washington. as the capital of U.S., Canberra, as the capital of Australia, are national economic centers, but political and cultural centers such as Tokyo in Japan, London in England, Paris in France, are all national economic centers. The consolidation of political center and cultural center is the decisive factor to make Beijing the national economic center. As was stated above, Beijing's political employment serving the whole country is 170 808 persons. If everyone supports a family member, the total is 341 616 persons. Added up 132 000 official business persons from other places, the total population only corresponds to a middle - sized city. However, if further added up cultural employment serving the whole country and their family members, relevant 758 000 travelers and other 442 000 floating persons, the total 2809 thousand persons is up to a metropolis.

2) whether the capital is in a unitary country or a federal country. A unitary government collects much power and government offices are concentrated in the capital, so the capital has a large population and superior human capital and information. Conversely, a federal government has less power and government offices are relatively dispersed, so the capital has a smaller population and worse human capital and information. Therefore, generally the capital in a federal country is not the national economic center, but the capital in a unitary country is the national economic center. In our unitary country, the Party Central Committee and State Council have very high authority, and the government and party agencies highly concentrated in Beijing, which certainly helps Beijing become the national economic center.

3) the status of the state-owned economy and the degree of national intervention in economy. The capital generally collects the representatives of state-owned economy and regulators of national economy. Therefore, the more higher the status of the state-owned economy is, the more stronger the economic intervention is, the more possible a capital become the national economic center. The state-owned economy is dominant in our country and government's intervention to economy is strong, which is sure to strengthen Beijing's role of economic center.

3 TRENDS IN BEIJNG'S ECONOMIC BASE

Tab.4 and Tab. 5 show the change of Beijing's industrial and service bases during 1990 - 1994. Generally speaking, Beijing's industrial base has been decentralized and service base centralized since 1990. The trend in every sector is as follows:

1) The *LQ*s of electronic and telecommunication equipment, transportation equipment and printing have been decreasing, which doesn't suit Beijing's superior external economies and scarce water and other resources. Except for them, the *LQ*s of other low water-consuming and light polluting industries have been increased, and except textile the *LQ*s of middle water-consuming and light polluting industries have been decreased, which corresponds to Beijing's comparative advantage.

2) In other industries, smelting and pressing of ferrous metals and chemical products have been decreasing, which suits Beijing's comparative advan tage. The others have been increasing, which doesn't suit Beijing's comparative advantage.

3) In service bases, engineering service, transportation, catering trade, supply and marketing and storage have decentralized, while politics and culture, information service, finance and business management have centralized, which reflects Beijing's intensive information and corresponds to the requirement to construct Beijing into a world city.

Table 4 Changes of location quotients of industrial bases *

Industrial Type	Increasing *LQ*	Decreasing *LQ*
Knowledge-intensive		
Low water-consuming, Light-polluting type	Machinery(1.03/1.42)	Transportation Equipment (1.75/1.54)
		Electronic and Telecom. Equipment(1.75/1.54)
	Electrical Equipment(0.77/0.78)	
	Instruments & Meters(1.38/1.38)	
Middle water-consuming, Light-polluting type		Pharmaceuticals(0.86/0.83)
High water-consuming, Light-polluting type	Petroleum Processing & Coking(0.20/1.28)	
High water-consuming, Heavy-polluting type		Ferrous Metals (2.55/1.71)
		Chemical Products(2.27/0.79)
Non knowledge-intensive		
Low water-consuming, Light-polluting type	Garments(1.64/1.87)	Printing(2.36/2.33)
	Feather, Fur & Down(0.53/0.76)	
	Furniture (1.43/2.61)	
	Stationery & Sports Goods (1.59/1.65)	
	Metal Products (0.90/1.20)	
Middle water-consuming, Light-polluting type	Textile(0.53/0.69)	Food(1.02/0.79)
		Timber-processing(1.01/0.69)
		Rubber Products (1.01/0.45)
		Plastic Products (0.71/0.53)
High water-consuming, Light-polluting type	Beverage(0.78/1.61)	
High water-consuming, Heavy-polluting type	Nonmetal Mineral Products(0.73/0.88)	
	Paper & Paper Products(0.51/0.52)	

* Sources: "China Statistical Yearbook, 1991", pp. 399 - 400; "Beijing Social and Economical Statistical Yearbook, 1991", pp. 292; "China Statistical Yearbook, 1994", pp. 388; "Beijing Statistical Yearbook, 1995", pp. 209.

Table 5 Location quotients of service bases in Beijing

Sector	1990	1994
Industries	1.94	1.73
Geological Prospecting, Exploration & Water Conservancy	1.35 *	1.60
Engineering Service	2.39	1.95
Transportation, Post & Telecommunication, Storage	2.25 *	1.37
Commerce, Catering Trade, Goods Supply & Marketing	2.25 *	1.79
Real Estate Management, Public Facilities, Residential and Consulting Services	5.13	7.98
Health Care, Sports & Social Welfare	2.29	2.77
Education, Culture & Arts, Radio, Film and TV	2.51	2.67
Scientific Research & Polytechnical Services	13.53	13.66
Finance & Insurance	1.67	2.01
Government Agencies, Party Agencies & Social Organizations	2.92	3.21
Other Sectors	1.00	0.78

* Computed from 1990 census data, other data computed from "China Statistical Yearbook"(1991 & 1995).

Under market economy, a city should develop those industries intensively employing its abundant factors and import goods and services intensively employing its scarce factors. Beijing has intensive knowledge and information and superior external economies and is also one of the few cities defined by the State Council to be built into modern international cities, but has scarce water and other natural resourc-

es. Owing to the imperfection of market mechanism and environmental policies and laws, Beijing's advantage and disadvantage can't be fully transformed into market signals to effectively impact decisions of enterprises and government departments. These are the fundamental reasons why some trends in economic bases unsuitable to Beijing's conditions appeared. It can be expected that along with the development of market mechanism, Beijing's potential in factors, external economies, and demands and strategic behavior is sure to be transformed into real advantage, thereby the advantageous trends can be strengthened, while the disadvantageous trends be checked and reversed.

4 POLICY RECOMMENDATIONS

1) Define Beijing's position as the national economic center. Beijing's is not only the national political and cultural center, but also the national economic center, namely the largest national service center and low water-consuming, light-polluting, knowledge and non-knowledge intensive industrial center, which corresponds to Beijing's comparative advantage, favors to coordinate economic development of the South and the North and maintains the country's peace and order for a long time, so the state should define this idea strategically.

2) Actively develop producer service base. In 1993, the State Council made an envision to build Beijing into a modern international city in "Reply to the master plan of Beijing". Beijing's producer service is far from the requirement of a modern international city. To actively develop producer service, we should first play the role of market mechanism to separate services production from goods production and realize the socialization, specialization and scale economy of service production; secondly, we should encourage native enterprises to engage in international performance and attract corporate headquarters from other places and overseas to settle in Beijing.

3) Mainly develop low water-consuming, light polluting knowledge and non-knowledge intensive industries. On account of historical reasons and imperfection of market mechanism, the high water-consuming and heavy polluting industry has overdeveloped while the low water-consuming and light polluting knowledge-intensive industry is underdeveloped and much smaller than that of Shanghai. Although non-knowledge intensive or some external economy-typed industry is larger than that of Shanghai, its potential is far from being fully played. For example, the proportions of sewing and printing & publishing to the total industrial output are by far lower than 26.9% and 12.2% of New York. Therefore, we should actively put the prices of water and other factors to the market, formulate and enforce rigorous environmental standards and policies, restrict the development of high water-consuming and heavy polluting industry, and support the development of low water-consuming, light polluting knowledge and non-knowledge intensive industries.

4) Coordinate the relation of Beijing to its periphery, and in particular, to Tianjin. Developed peripheral areas are the foundation for building Beijing into an international city, and the harbors around Bohai Sea, especially Port Tianjin are Beijing's gateways to the sea, therefore, we should foster a strategic conception that to develop peripheral region is to develop Beijing, actively enhance the mutually complementary advantage and development coordination between Beijing and its periphery, especially and Tianjin and shift those industries unsuitable to capital features out to peripheral area.

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