Global Urban Competitiveness(2010) : General Report

Cities: Everything is possible in the future.

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1. Introduction

1.1 Global urban competitiveness: The conceptual framework and index system

Global urban competitiveness is defined as a city's ability to attract and transform resources, control and dominate the market, thus creating more wealth in a faster and better manner as well as providing welfare for its citizens. , This is the result of the combination of urban enterprise operational elements with industrial systems in comparison with other cities in the world. In the light of the definition, There there are two conceptual frameworks and two index systems about global urban competitiveness in the ascept aspects of input and output

From the definition of urban competitiveness, we know it means the ability to continuously create the most wealth at the lowest cost within the shortest time. From the perspective of manifestation or output, we can assess global urban competitiveness with the following framework.

UC= F (C, S, L, A, E, P, G, I, D)

UC is urban competitiveness, also referred to as urban comprehensive competitiveness in the Report.

C = Cost, S = Economic Scale, E = Employment, A = Aggregation, L = Development Level, P = Labor Productivity, I = Innovation, G = Economy Growth, and D = Decision-making Ability.

Cost is the most important comparative advantage of a city and significant sources of urban competitiveness. Obviously, commodities of the same quality can obtain greater market share if they are sold at a lower price. The ratio of the nominal exchange rate to the real exchange rate, an important index of urban competitiveness, can partially reflect the advantage of a city in a country or region in price compared with those of other countries.

Economic scale is an important indicator of competitiveness. Economies of scale promote market competitiveness through reducing the cost of unit products. If market share is an important index of competitiveness, then the magnitude of GDP is a reflection of the market share of a city in both internal and external markets.

Economic growth is an important reflection of a city's potential competitiveness. The growth rate of GDP, especially long-term growth rate, is an important index of a city's economic speed.

Development level is for a reflection of the city's competitiveness and development. GDP per capita is an important indicator of a city or a region's development level. It is also an

important reflection of its citizens' incomes.

Production efficiency is the decisive factor for urban competitiveness and development. To a significant degree, competitiveness lies in the production efficiency. Labor productivity, the key to production efficiency, reflects the value added or wealth created by per unit of labor.

Employment also reflects a city's competitive performance in global competition. It is also an important reflection of citizens' welfare. Therefore, we consider it to be an important indicator of urban competitiveness.

Economic aggregation promotes competitiveness through a reduction of the transaction cost The aggregation effect can lead to knowledge sharing, technology spillovers, brand effect, external economies and other economic effects. GDP per square kilometer is an important indicator of output aggregation resulting from the aggregation of production factors. It is also an important indicator of efficiency, reflecting the amount of wealth created per square kilometer.

Technological innovation is at the core of urban competitiveness and its achievements are an important reflection of urban competitiveness. The number of international patent applications is another useful indicator of urban competitiveness. Due to the diffusion effect in the transformation of scientific and technological results, we use the gross index instead of the average index.

Decision-making ability show the extent to which a city controls the world economy. The ability is decided by the number of multinational corporations located in a city, and we use this as an indicator of urban competitiveness**.**

Based on the above analysis, the output index system of global urban competitiveness is listed as below.

Table 1.1 Output Index System of Urban Competitiveness

Index	Implications of the Index
GDP	A city's products and service market share
GDP per capita	A city's development level and residents' welfare level
GDP per square kilometer	Degree of economic aggregation
GDP growth rate	Economic speed
Labor productivity	Economic efficiency
Employment rate	Important macro economy performance and residents' welfare level
Ratio of nominal exchange rate to real exchange rate	Advantage in the price of commodities and services
Number of international patent applications	Ability of scientific and technological innovation
Multinational corporation score	Economic decision-making and controlling ability

1.2 Global urban competitiveness: definition of city

City usually refers to a concentrated residential area with relatively high degree of urbanization. But countries vary from each other in terms of the concrete definition of city and the definition of scope. Some take the population size as the definition standard; while others take the historical, legal or administrative concept as the defining standard of city.

The so-called city in this Report refers to the concentrated residential area under the governance of an administrative management center, including not only the urbanized area,

but also the suburb or village. From this definition, it can be seen clearly that the city we refer to is a city in the administrative concept. Nevertheless, it is still necessary to explain the difference and connection between this concept of city and urbanized area and urban area specially.

City and region The administrative division varies from country to country. Some countries set up the administrative unit of region below state (province) and above city, such as China and India and many European countries. The administrative center of these regions is usually a city; while the supreme administrative organ of the city governs some other cities. Under this circumstance, city hereof only refers to the district itself, excluding other cities under it.

City and urbanized area The difference between city and urbanized area is that city is a region in the administrative sense; while urbanized area refers to a region in the social and economic sense, namely, urbanized area means an urbanized region excluding the village. According to this difference, urbanized areas are usually differentiated from the urban area. When an area is highly urbanized, the size of the urbanized area may be larger than certain urban area, because the former probably includes some areas of other cities. While when the urbanized degree of an area is relatively low, the size of the urbanized area will be smaller than certain urban area, because the latter will include the suburb or village.

City and metropolitan area Some countries also have the concept of metropolitan area (e. g. the US and Canada). This concept is in the statistical sense, namely, when the urbanization of some countries reaches certain degree, the connection of neighboring urban areas will be enhanced in terms of economy and society and the sharing degree of infrastructures will be high. In order to reflect the development of this area more comprehensively, statistic institution will deem these urban areas as a unit in statistics, namely, metropolitan area. Therefore, generally speaking, the size of a metropolitan area is usually larger than that of the urban area.

What needs to be pointed out is that in the course of research, due to the accessibility of data, some cities adopt the concept of urbanized area, while others adopt the concept of metropolitan area. We have made special explanation in these parts. Cities without special explanation are the ones in the administrative sense.

1.3 Global urban competitiveness: 500 sample cities

The candidate cities are selected for the Global Urban Competitiveness (GUC) study. 500 sample cities across the world are selected for general assessment of their competitiveness.

In the first step, a rough scanning is made for cities in countries and regions of the 6 continents. Candidates are selected from major cities for initial screening.

Next, the number of sample cities in each country or region is identified within the total of 500 worldwide, referring to local population and income per capita.

Then specific sample cities are selected in each country or region sequentially according to the size and competitiveness.

Finally, adjustments are made for sample cities in each country with considerations of the availability, accuracy and standardization of the statistical data of each city. Eventually, those with more standard and accurate data available are selected as sample cities.

In terms of geographic distribution, the 500 cities selected through the above steps are located in 130 countries and regions in 6 continents. Specifically, 181 of the cities are in Asia, 143 in Europe, 100 in North America, 36 in Africa, 28 in South America and 12 in Oceania. In terms of development stage, the 500 cities may be divided into 4 groups by the standard of GDP per capita (based on official exchange rates as of 2005). 91 of the sample cities are with GDP per capita of more than 40,000 dollars, 72 between 30,000 and 39,999 dollars, 74 between 10,000 and 29,999 dollars and 263 less than 10,000 dollars. In general, these 500 cities represent the development levels of different regions in today's world. The reader should refer to the Global Urban Competitiveness Index Ranking for the 500 sample cities.

1. 4 Global urban competitiveness: specific data sources

Nominal exchange rate/ PPP exchange rate The data come from the website of World Bank (http://www.worldbank.org).

Gross domestic product The data about the gross domestic product primarily comes from official websites of the cities; municipal, regional or national statistical websites; websites of municipal, regional or national departments; municipal, regional or national statistical yearbook; statistical report of the European Union, wikipedia website (http://en.wikipedia.org/wiki/Main_Page), national GDP rank by the World Bank, websites of city mayors (http://www.citymayors.com), and relevant reports on the Internet.

GDP per capita Data source: same as the gross domestic product.

GDP per square kilometer Data source: same as the gross domestic product.

Real economic growth rate (for 5 Years) Data source: same as the gross domestic product.

Employment rate Data source: same as the gross domestic product.

Labor productivity Data source: same as the gross domestic product.

Number of international patent applications Data source: website of the World Intellectual Property Organization (WIPO) (http://www.wipo.int/).

Multinational corporation score Data source: websites of sample enterprises.

1.5 Global urban competitiveness: data processing

In view of the above data collecting channels and the challenges and complexity in data collection, the following methods are employed for data processing:

1. 5.1 Data about population and area : unified processing

For some indexes, e.g., population and area, first-hand data are available in every city. However, these data might have been collected according to different standards. In such cases, we would first study the indexes and standards of United Nations Statistical Division (UNSD), World Bank World Development Indexes, OECD Database and other international organizations. Then we would determine an approach for the conversion of data of each country and set up the most proper, comparable and widely used statistical standards for data processing. Eventually, we were able to build a uniform database to cover the 500

international cities. With regard to population, for example, some cities only provide domiciliary population, some provide permanent population, and others include temporary population in their statistics. In our study, they are all converted into permanent population. For another example, the "area" might be land area only for some cities, and the sums of land and water areas for others. In our study, adjustments are made so that the area means land area only.

1.5.2 Calculation of GDP based on other GVA

If some data cannot be obtained directly, then they can be calculated according to their quantitative relations with the relevant variables collected. For example, if we cannot obtain the accurate GDP information on a city, but can obtain its accurate GVA data, then we can calculate the country's or the city's GDP in accordance with its similar quantitative relationship with its GVA. This method has mainly been adopted in GDP data processing in the British cities, as well as some other European cities.

1.5.3 Estimation of GDP

Since this is a method of estimation, the data obtained in this way are less accurate than those obtained by the above two methods. It is the calculation of the city's variables with other relevant knowledge or experiences on the basis of the relevant variables collected. Though not frequently used, this method has been widely used. That is, it can almost be applied in the data processing of all the index systems, but only a few cities adopt it in their data processing. For example, as the GDP data of some cities in South America and Africa are hard to obtain, we can only refer to the GDP data of its country or other cities in its country, or even in other countries, and then estimate the GDP data of this city on the basis of the relevant information or sometimes the researcher's experience. Other examples can be found in the data of various index systems of several cities.

1.5.4. Direct calculation of GDP per capita, GDP per square kilometer, GDP growth rate and labor productivity

When some variable data are not directly available, we will calculate in accordance with strict logical relationship from two or more other relevant variable data. This involves three aspects. One is the reversible calculation between the equalizing value index and the total amount index. For example, a city's GDP, GDP per capita, GDP per square kilometer as well as the labor productivity can be reversibly calculated through such intervening variables as the city's area, population and employed population. The second is the calculation of the variable static data and the dynamic data. For example, a city's GDP growth rate can be calculated through the chronological data of its GDP. The third is the calculation between the index absolute value and proportion, such as the reversible calculation among number of the labor force, employed population and the unemployment rate. The direct variable calculation method has been extensively used in our research. Due to its conformity to the strict logical relationship between the variables, the calculated variables are undoubtedly accurate on the condition that the existing variables are known to be accurate.

1.5.5. Direct calculation of nominal exchange rate/ PPP exchange rate.

The ratio of nominal exchange rate to real exchange rate is obtained from the World Bank after converting the nominal income per capita denominated in US dollar and PPP income per capita denominated in US dollar of various countries in 2005, which are national data.

1.5.6. Number of international patent applications.

Number of international patent applications about every city could be searched directly from website of WIPO.

1.5.7. Calculation of multinational corporation score

Multinational corporation score involved six industries: multinational management consulting corporation score, multinational accounting corporation score, multinational corporation law score, multinational advertising corporation score, multinational media corporation score, multinational financial corporation score.

1.5.7.1 The Sampling of the Multinational Corporations in Different Industries.

In order to make the analysis results comparable, we have made the multinational corporation sampling in accordance with the rankings in each industry of the Forbes Global 2000. For more details, see Table 1.2 below.

Table1.2 Multinational Corporation Score: Sample Multinational Corporation in Each of the Indexes

Index	Sample Enterprise	Remarks
Multinational management consulting corporations	The global top 25 multinational corporations according to the revenue	The global distribution data of some enterprises are hard to obtain, which are therefore substituted by enterprises ranking 25-30 in the
Multinational accounting corporations	The global top 25 multinational corporations according to the revenue	The global distribution data of some enterprises are hard to obtain, which are therefore substituted by enterprises ranking 25-30 in the
Multi law corporations	The global top 25 multinational corporations according to the revenue	The global distribution data of some enterprises are hard to obtain, which are therefore substituted by enterprises ranking 25-30 in the
Multinational advertising corporations	The global top 25 multinational corporation according to the revenue rankings in the industries of	The global distribution data of some enterprises are hard to obtain, which are therefore substituted by enterprises ranking 25-30 in the same list.
Multinational media corporations	The global top 25 multinational corporation according to the revenue	The global distribution data of some enterprises are hard to obtain, which are therefore substituted by enterprises ranking 25-30 in the
Multinational financial corporation	The top 75 financial multinational corporations of the Forbes Global 2000 (2005)	Including the industries of finance, insurance and banking of the Forbes Global 2000 (2005) industrial classification; the global distribution data of some enterprises are hard to obtain, which are

1.5.7.2Marking Criteria and Principle

In accordance with the global network configuration and distribution characteristics of the multinational corporations around the world, the following marking criteria will be observed: 1) the city where the multinational corporations' global headquarters congregate (five points); 2) the city where the multinational corporations' regional headquarters congregate (four points); 3) the city where the multinational corporations' national headquarters congregate (three points); 4) the city where the multinational corporations' branches congregate (two points); 5) the city where the multinational corporations' agencies (i.e. the small-scale branches with limited functions) congregate (one point). The above five items make a basic marking criterion, while during the concrete operation, due to the unclear information provided by corporations or the different configurations of multinational corporations' global network, it is very hard to judge directly the grades of the multinational corporations' branches. In such a case, we make the subsidiary judgment mainly from two aspects: one is to search online and decide the status of the multinational corporation's branches according to the relevant information collected in this way; and the other is to make the judgment according to the number and scale of the distribution of the multinational corporations' branches in different cities. Generally speaking, in the same country, if it has the

most or the largest branches of a multinational corporation, the city is superior to other cities in the global network of the corporation; moreover, the function of the branches in it are also superior to that of the corporation's branches in other cities. On the basis of combining these two aspects, if it is still unable to make the judgment of a city with the obtained information, then it will be given two points.

After the marking of the distribution status of the chosen multinational corporations in the same industry one by one, a city's multinational corporation score will be figured out by equal-weight accumulation of the city's six industrial score.

1. 6 Global urban competitiveness index: assessment and calculation methods

The global urban competitiveness assessment system is developed from the research model in the Annual Report on Urban Competitiveness of Dr. Ni Pengfei. This book comes down in one continuous line with the Annual Report on Urban Competitiveness in terms of competitiveness analysis framework and main thoughts, and refers to it in the setup of index system. But due to the change of research object, research topic and audience, as well as the restrictions of many subjective and objective factors in the course of data collection, compared with the Annual Report on Urban Competitiveness, this book has made certain update and adjustment in the competitiveness assessment system and measurement methods. Out of academic prudence, the results and main conclusions from the index system used in this book are not directly comparable to the Annual Report on Urban Competitiveness. We suggest readers to deem the two as the measurement to urban competitiveness from different angles and levels. Next we will introduce the technical problem in the data processing and integration.

1. 6.1 Standardization of first-hand data

The index system of the global urban competitiveness is enormous with numerous data. The dimension varies from index to index. First, it needs to conduct the standardized integration. All the index data have to go though the non-dimensional processing. The objective indices can be divided into singular objective indices and composite objective indices. To conduct the non-dimensional process to the original data of singular objective indices, this paper primarily adopts the standardization, indexation, and threshold value method. The formula for computing standardization is:

$$X_i = (x_i - \bar{x}) / Q^2$$

x_i is the original data, $\bar{x}$ is the mean, Q^2 is the variance, X_i is the data after the standardization.

The calculation formula of the indexation method is:

$$X_i = x_i / X_{0i}$$

x_i is the original value, X_{0i} is the maximum, X_i is the index.

Threshold Value method:

$$X_i = (x_i - x_{\min})/(x_{\max} - x_{\min})$$

x_i is the value after the conversion, $x_{\max}$ is the maximum sample value, $x_{\min}$ is the minimum sample value, X_i is the original value.

The non-dimensional processing of original data of composite objective index is as follows: first, conduct quantitative process to the single index in the component, and then use the equal weight method to acquire the composite index.

1. 6.2 Global urban competitiveness index (GUCI) of the 500 cities

In the course of the combination of comprehensive competitiveness indices, the non-linear weighted integration method is adopted. The so-called non-linear weighted integration method (or multiplicative integration method) uses the non-linear model:

$$y = \prod_{j=1}^{m} x_j^{w_j}$$

to conduct the comprehensive assessment. In the formula, w_j is the weight coefficient, $x_j \geq 1$. As far as the non-linear model is concerned, when computing the 9 explicit indices of the urban comprehensive competitiveness, as long as one index is extremely small, the value of the comprehensive competitiveness will approach zero rapidly. In other words, this assessment model is sensitive to indices of small value, and slow to indices of relatively large value. By using the non-linear weighted integration method to measure the urban competitiveness, we can reflect the composite indices more comprehensively and scientifically.

While we synthesize the 9 explicit indices, we first employ the threshold value method to the index data in the non-dimensional processing, and then get the integrated value by applying the non-linear weighted integration method. What needs to be pointed out is that in the course of the non-dimensional processing, some indices with the value of 0 are conferred the minimum of 0. 05 to avoid the phenomenon of 0 integrated product when integrating the indices. See Table 1.3below for the weights adopted.

Table 1.3 Overview of weights of explicit indices

Index	Normal exchange rate/ real exchange rate	Gross GDP	GDP per capita	GDP per square kilometer	Real economic growth rate (for 5 Years)	Employment rate	Labor productivity	Number of international patent applications	Multinational Corporation Score
Weight	0.05	0.05	0.1	0.1	0.2	0.1	0.1	0.1	0.05

After determining the weights of measuring indices in the comprehensive competitiveness index integration, we can employ the non-linear weighted integration method to calculate the comprehensive competitiveness index of each city, whereupon to rank the comprehensive competitiveness of the 500 cities.

Assuming that such indices as the normal exchange rate / real exchange rate, gross GDP, GDP

per capita, GDP per square kilometer, real economic growth rate (for 5 years) , employment rate, labor productivity, number of international patent applications and Multinational Corporation Score are expressed with x_1, x_2, x_3, x_4, x_5, x_6, x_7 and x_9, the comprehensive competitiveness indices can be integrated by using the above non-linear model, here w_1, w_2, w_3, w_4, w_5, w_6, w_7, w_8 *and* w_9 are 0.05, 0.05, 0.1, 0.1, 0.2, 0.1, 0.1, 0.05, and 0.05 respectively.

1. 7 Global urban competitiveness: dynamic clustering analysis

The underlying idea of dynamic clustering analysis is to select a number of sample points as the clustering centers in the first place; next, the samples are made to concentrate toward the centers in accordance with specific clustering standards for an initial classification; then judgment is made on whether the classification is reasonable; if not, the clustering centers will be revised; the step is performed repeatedly until the classification is reasonable. There are a number of dynamic clustering calculation methods, among which, the most famous ones are the K-average method and the ISODATA method. In this study, the K-average method is employed. The following is a brief introduction to the method:

If there are N samples to be classified, i.e., X_1 X_2 …., X_n, and there are K clusters, N≥K,

Step 1: randomly select K initial clustering centers, z_1 , z_2…, z_k e.g., the first K samples (called the old clustering centers);

Step 2: put each sample into a category of the old clustering centers in accordance with the neighboring principle;

Step 3: calculate the gravity center of each category after the classification. These gravity centers are called the new clustering centers: $Y_i = \frac{1}{N_i}\sum_{X \in \Omega_i} X, i = 1,2,\ldots,K$, in which, N_i is the number of samples of category w_i;

Step 4: check whether z_1 , z_2…, z_k equal to Y_1 , Y_2,… Y_k respectively; if yes, the calculation is completed; if not, replace z_k with Y_k and return to step 2.

Based on the above theory, dynamic clustering analysis is made on the sample cities, using the 9 explicit indexes of the 500 cities.

2. Global Urban Competitiveness: Which cities are the most competitive in the world?

Global Urban Competitiveness (GUC) is the ability of a city to attract and utilize resources, provide goods and services, create wealth and provide its citizens more, faster and better than other cities in the world. Based on this definition, we collected data on 9 indexes including GDP, GDP per capita, labor productivity, number of multinational companies, number of internationally recognized patent applications, price advantage, economic growth rate and employment rate. We compiled the Global Urban Competitiveness Index (GUCI) for 500 cities around the world. As these 500 cities are distributed in over 130 countries and regions in 5 continents, and all 9 indexes use objective data to measure the general performance of wealth creation in cities, we can gain insight on the development and competitiveness of cities around the world by comparing and analyzing the GUCI of these 500 cities and their components. The main findings are provided in this chapter.

2.1 World cities are top cities and hi-tech centers are among the leaders

World cities and global hi-tech centers are the most competitive among all cities. New York, London and Tokyo are the top three cities in terms of GUCI. The top 20 include world cities such as Paris, Washington, Los Angeles, Singapore, Chicago, Toronto, Seoul and Madrid, as well as well-known global hi-tech centers, such as Stockholm, San Francisco, Boston, San Diego, Auckland, Helsinki and Vienna. Figure 1.1 and Table 2.1 show the GUCI distribution of the 500 cities.

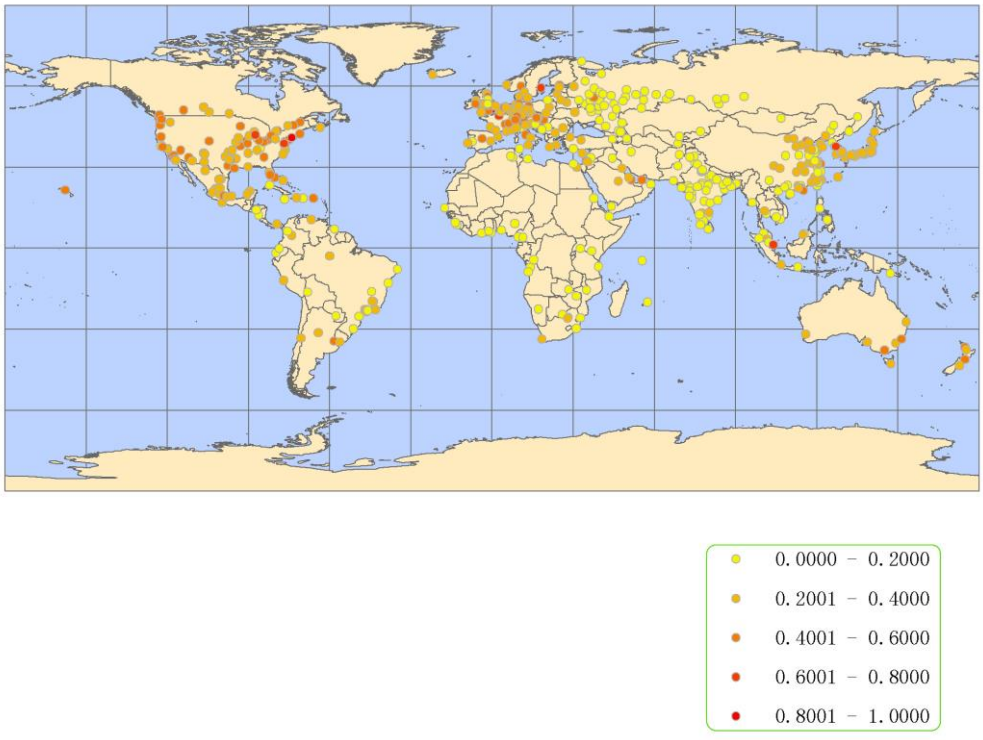


Figure 2.1 Distribution GUCI of 500 cities (Unit: index value)

Table 2.1 The top 20 and bottom 20 cities among the 500 cities in terms of comprehensive competitiveness GUCI

City	Country	Continent	Index	Rank	City	Country	Continent	Index	Rank
New York	US	North America	1	1	Allahabad	India	South Asia	0.083421	481
London	UK	Western Europe	0.944185	2	Conakry	Guinea	West Africa	0.082216	482
Tokyo	Japan	East Asia	0.790169	3	Yaounde	Cameroon	Central Africa	0.080402	483
Paris	France	Western Europe	0.759375	4	Meerut	India	South Asia	0.080058	484
Washington	US	North America	0.696406	5	Rajkot	India	South Asia	0.079577	485
Los Angeles	US	North America	0.668836	6	Brazzaville	Congo	Central Africa	0.077836	486
Stockholm	Sweden	Northern Europe	0.647921	7	Jabalpur	India	South Asia	0.077169	487
Singapore	Singapore	Southeast Asia	0.645897	8	Asansol	India	South Asia	0.07673	488
San Francisco	US	North America	0.642095	9	Haora	India	South Asia	0.075575	489
Chicago	US	North America	0.629848	10	Abijan	Cote d'ivoire	West Africa	0.074823	490
Toronto	Canada	North America	0.617565	11	Vijayawada	India	South Asia	0.073168	491
Seoul	South Korea	East Asia	0.616719	12	Lome	Togo	West Africa	0.067305	492
Boston	US	North America	0.596854	13	Port Moresby	Papua New Guinea	Oceania	0.06508	493
San Diego	US	North America	0.588197	14	Kinshasa	Zaire	Central Africa	0.063458	494
Oakland (US)	US	North America	0.582597	15	Blantyre	Malawi	South Africa	0.054121	495
Helsinki	Finland	Northern Europe	0.574753	16	Pyongyang	North Korea	East Asia	0.052684	496
Madrid	Spain	Southern Europe	0.571633	17	Port-au-Prince	Haiti	Latin America	0.042224	497
Vienna	Austria	Central Europe	0.569158	18	Groznyj	Russia	East Europe	0.03634	498
Philadelphi	US	North	0.56491	19	Djibouti	Djibouti	East Africa	0.02827	499

a		America	1					5	
Houston	US	North America	0.55549 1	20	Harare	Zimbabwe	South Africa	0	500

2.2 North American cities have higher ranks than European and Asian cities

Among the top 20 global competitive cities, 10, or a half are in North America and 7 or 35% in Europe. All together, the North American and European cities account for 90% of the top 20 cities. Only 3 cities are in Asia. None of the top 20 cities are in Oceania, South America and Africa.

Among the top 150 global competitive cities, 59 are in North America, accounting for 84.3% of the sample cities in the region; 52 are in Europe, accounting for 36.4%; 27 are in Asia, accounting for 14.9%; 6 are in Latin America, accounting for 10%; and 6 are in Oceania, accounting for 50%. Again, none of the African cities is on the list of top 150. Figure 1.2 shows the regional distribution of top 150 global competitive cities.

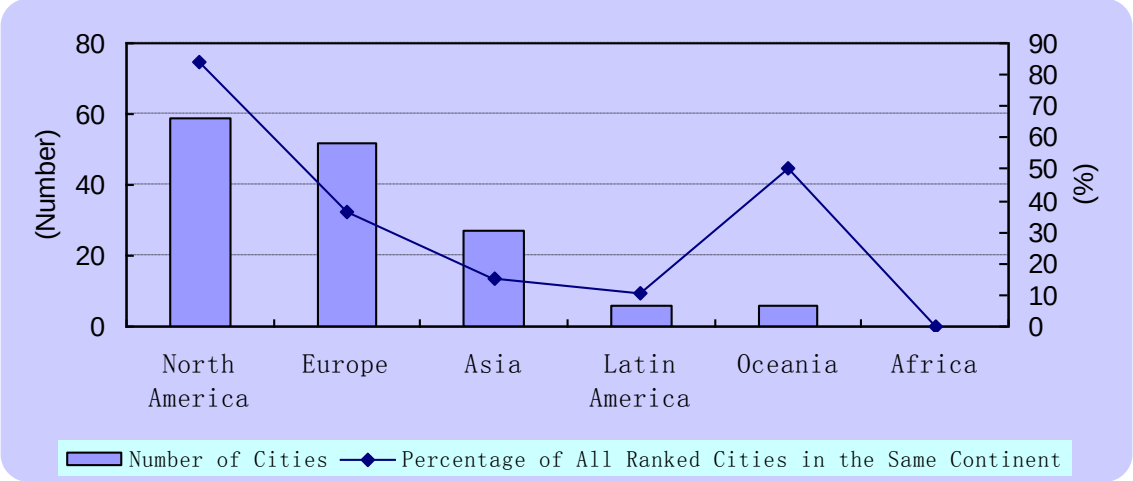


Figure 2.2 Regional distribution of top 150 global competitive cities

Among the bottom 150 cities, 46 are in Europe, accounting for 32.2% of the sample cities of the region; 62 are in Asia, accounting for 34.3%; 11 are in Latin America, accounting for 19%; 1 is in Oceania, accounting for 8.3%; and 30 are in Africa, accounting for 83.3%. No North American city is found on this list.

A comparison of the cities in different continents indicates that, in general, North American cities have the highest GUCI rankings, followed by European cities. Some of the Asian cities have considerable potential, while cities in Latin America (including the Caribbean region and Africa) have weaker competitiveness, and those in Sub-Sahara regions are least competitive.

2.3 World cities, hi-tech centers and national centers are top cities in each continent

Among the top 10 cities in North America, 9 are in the United States and 1, which is Toronto, is in Canada. Most of these cities are national/regional political and economic centers, or major hi-tech centers in the United States and Canada (See Table 2.2).

Among the Asian and Middle Eastern top 10 cities, 3 are in Japan and 2 in China (including Hong Kong). Singapore, South Korea, Israel, United Arab Emirates and Qatar each has one city on the list. It indicates that cities of the developed nations, i.e., Japan and Israel (4 in total), remain the most competitive, followed by those in emerging industrialized countries (3 in total) in Asia. In addition, cities in the oil producing countries in west Asia and China, which is a developing country, are fairly competitive, too.

In Europe, 3 of the top 10 cities are in Western Europe, 2 in Northern Europe, 3 in central Europe, 1 in Southern Europe and 1 in Southeast Europe. None of the cities is in Eastern Europe. Most of these cities are capital cities or economic centers of developed nations (See Table 2.2).

Table 2.2 Top 10 global competitive cities of 3 major continents

	North America			Asia			Europe		
Regional Rank	City	Country	Global Rank	City	Country	Global Rank	City	Country	Global Rank
1	New York	US	1	Tokyo	Japan	3	London	UK	2
2	Washington	US	5	Singapore	Singapore	8	Paris	France	4
3	Los Angeles	US	6	Seoul	South Korea	12	Stockholm	Sweden	7
4	San Francisco	US	9	Hong Kong	China	26	Helsinki	Finland	16
5	Chicago	US	10	Tel Aviv	Israel	33	Madrid	Spain	17
6	Toronto	Canada	11	Dubai	United Arab Emirates	39	Vienna	Austria	18
7	Boston	US	13	Shanghai	China	41	Zurich	Switzerland	21
8	San Diego	US	14	Doha	Qatar	55	Dublin	Ireland	27
9	Oakland (US)	US	15	Nagoya	Japan	56	Frankfurt	Germany	28
10	Philadelphia	US	19	Yokohama	Japan	57	Milan	Italy	29

2.4 Cities of developed countries are more competitive while central cities of newly industrializing and transitional countries have higher potential

A comparison of the distribution of the 500 cities by country shows that 10 of the top 20 cities are in the United States, accounting for 17.5% of all US sample cities. Six are in EU, accounting for 8.1%. Canada, Japan, South Korea and Singapore each have one top 20 city, accounting for 7.7%, 4.5%, 14.3% and 100% of their total sample cities respectively (Singapore is a city itself).

Among the top 150 cities, 50 are in the United States, accounting for 87.7% of the sample cities of the nation; 13 in Britain, accounting for 72.2%; 11 in Germany, accounting for 64.7%; 10 in Japan, accounting for 45.5%; 9 in Canada, accounting for 69.2%; 5 in France, accounting for 62.5%; 3 in Italy, accounting for 33.3%. Among the BRIC nations, China has 7 cities on the list, accounting for 11.3% of its sample cities; Russia and India have one each, accounting for 2.3% and 2% of their respective sample cities. No Brazilian city is on the top

150 list (See Figure 2.3).

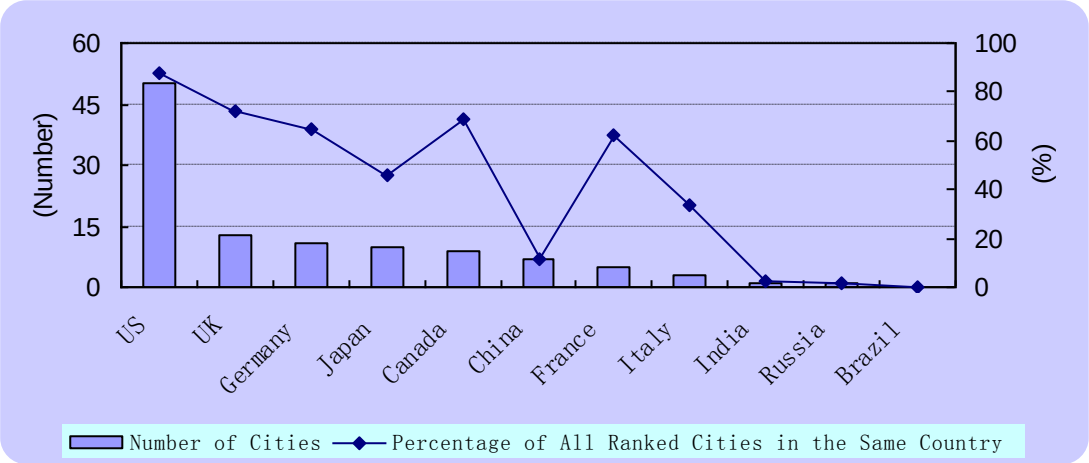


Figure 2.3 The distribution of top 150 cities by country

Among the bottom 150 cities, only one is in a developed country. All the remaining 149 cities are in developing countries and countries in transition. Specifically, 44 are in Russia, accounting for 88% of its sample cities; 36 are in India, accounting for 83.7%; 5 are in China, accounting for 8.1%; 2 are in Brazil, accounting for 13.3%.

In general, cities of developed countries are more competitive, while central cities of newly industrializing or transitional countries have higher potential. Cities of the least developed countries are generally not competitive, except that a few have moderate competitiveness.

2.5 A few countries show distinct national characteristics in competitiveness while most countries have substantial gaps in GUCI among their cities.

In Britain, the cities generally rank high. London tops the country list, and Liverpool is at the bottom. Between them, there are 186 other global cities distributed evenly. For Brazil, St. Paul is at the top and Port Alegre at the bottom of the list, with 163 other cities distributing evenly between them. In general, the ranks of Brazilian cities are low.

With the largest number of entries in the top 150, US cities are highly competitive in general. However, those at the bottom of the country list are no more competitive than some cities in developing countries. For example, the bottom two on the US country list, Wichita and Raleigh ranked the 205th and 245th respectively on the global list. Between New York, the top ranking city and Raleigh, the lowest ranking, there are 244 other cities distributing evenly between the first and 245th, with an average gap of 4.28.

In the case of Russia, the best performing city Moscow is separated by 120 other cities from the second best, St. Petersburg on the global list, and by 468 cities from the worst performing city Groznyj. However, 96% of the Russian entries rank between the 300th and 498th. Similar cases include India, whose cities are widely separated on the global list, but mostly distributed in different sections evenly.

Italy has two entries in the top 100 and one below 300. Most of its cities rank between the 100th and 300th in a quasi-normal distribution. Japan is more or less a similar case too

with 5 entries in the top 100 and 4 below the 250th.

This indicates that while the competitiveness gap between cities is narrow in some countries, the gap is wide in most countries. In a few countries, the GUCI ranks are in normal distribution.

3. Urban population: uneven distribution and growth, metropolis-style concentration

Population is the sufficient and necessary condition for the development of a city, as well as an important index of the size of a city.

3.1 As the world enters an urban era[1], the trend of metropolization is increasingly clear.

Starting from 2008, more than 50% of the world population will live in cities. While the trend of metropolization is becoming increasingly clear worldwide, the development of small and medium cities remains critical. On the one hand, as people continue to move in, major cities are experiencing reverse urbanization and suburbanization in developed countries. As more and more cities join together due to urban sprawls, the trend of metropolization is seen in many developed countries. On the other hand, in developing countries, medium and large cities tend to have better infrastructures. In the course of accelerated urbanization, people tend to concentrate in such cities in massive scale. As a result, more and more metropolises with populations of millions or even tens of millions are emerging, and the trend of metropolization is also clear. Nevertheless, the bulk part of the urban growth will occur in small cities and towns[2]. By 2025, more than half of the urban population will still live in small and medium cities with populations less than half a million.

Figure 3.1 and Table 3.1 show urban population distribution in the world.

Table 3.1 The top 20 and bottom 20 cities in the 500 cities in terms of population (Unit: person)

City	Country	Continent	Population	Rank	City	Country	Continent	Population	Rank
Mexico City	Mexico	Latin America	19231829	1	Geneva	Switzerland	Central Europe	185028	481
Shanghai	China	East Asia	17784200	2	Regina	Canada	North America	179040	482
Mumbai	India	South Asia	16400000	3	Malacca	Malaysia	Southeast Asia	169321	483
Beijing	China	East Asia	15380000	4	Basel	Switzerland	Central Europe	165212	484
Kuala Lumpur	Malaysia	Southeast Asia	15239445	5	Windhoek	Namibia	South Africa	161059	485
Calcutta	India	South Asia	14277000	6	Mainz	Germany	Central Europe	160530	486

[1] The United Nations Population Fund (UNFPA), “State of world population 2007”, June 2007.

[2] OECD Territorial Reviews: Competitive Cities in the Global Economy, www.oecd.org

Delhi	India	South Asia	12900000	7	Hamilton (NZ)	New Zealand	Oceania	155698	487
Tokyo	Japan	East Asia	12570904	8	Manama	Bahrain	West Asia	140616	488
Istanbul	Turkey	West Asia	11800000	9	Brussels	Belgium	Western Europe	138855	489
Karachi	Pakistan	South Asia	11608000	10	Port Louis	Mauritius	South Africa	130410	490
Sao Paulo	Brazil	Latin America	10838508	11	Perth	Australia	Oceania	129148	491
Moscow	Russia	East Europe	10406578	12	Niznij Novgorod	Russia	East Europe	128950	492
Seoul	South Korea	East Asia	10297004	13	Bern	Switzerland	Central Europe	127421	493
Paris	France	Western Europe	9772945	14	Norwich	United Kingdom	Western Europe	127100	494
Lagos	Nigeria	West Africa	9013534	15	Rayong	Thailand	Southeast Asia	122747	495
Lima	Peru	Latin America	8866160	16	Chester	United Kingdom	Western Europe	119100	496
Jakarta	Indonesia	Southeast Asia	8699600	17	Reykjavik	Iceland	Northern Europe	113848	497
Shenzhen	China	East Asia	8277500	18	Labuan	Malaysia	Southeast Asia	85575	498
New York	United States	North America	8213839	19	Begawan	Bandar Seri Begawan	Southeast Asia	30201	499
Tehran	Iran	West Asia	7797520	20	Victoria	Seychelles	East Africa	25000	500

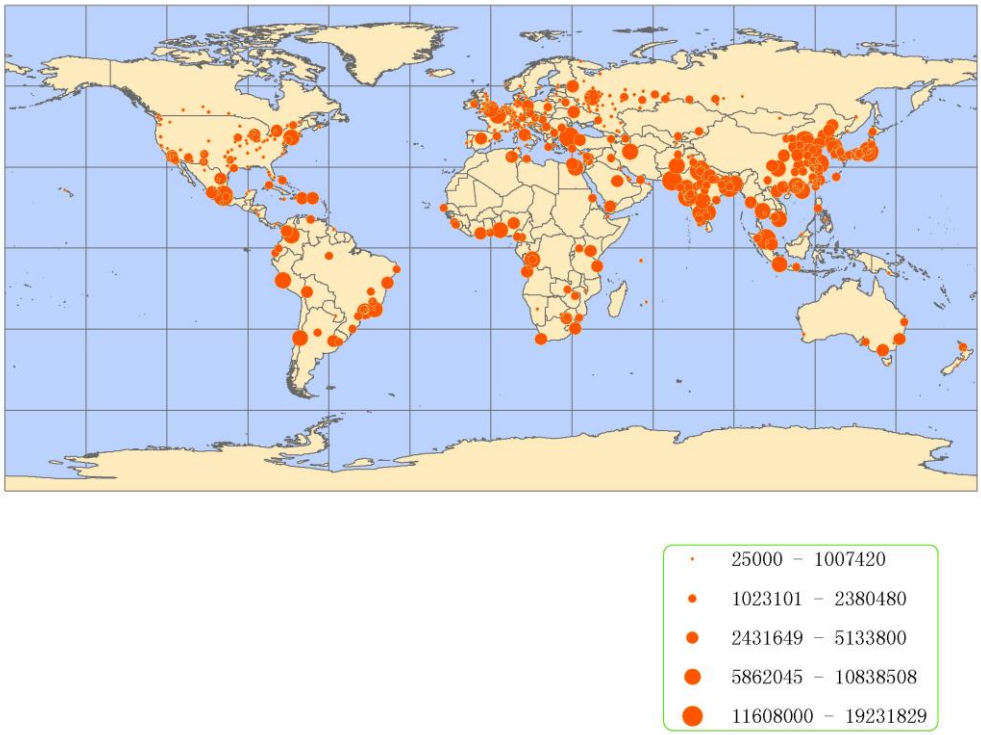


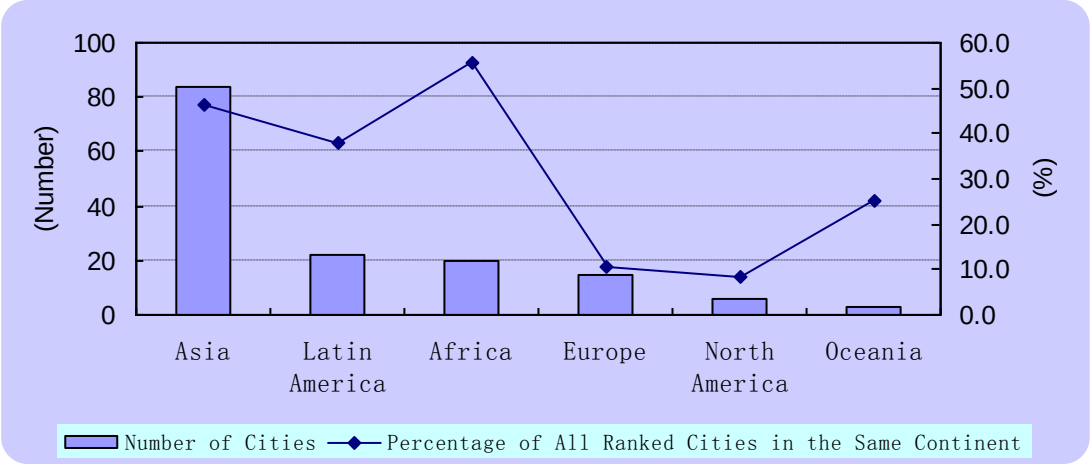
Figure 3.1 The distribution of urban population by city (Unit: person)

3.2 The urbanization processes and sizes of cities have distinct characteristics in each continent

In Europe, North America, Oceania, and other developed regions, more than 70% of the population live in cities. In some of the developing regions, including Latin America and the Caribbean countries, 78% of the population live in cities. It means that, in Europe, North America, Oceania, Latin America and the Caribbean region, the urbanization process has been basically completed. In the developing regions in Asia and Africa, 40% of the population live in cities. With the increase of income, the urbanization process is accelerating in these regions, particularly in China and India.

Among the 20 most populated cities, the majority are political and economic centers in developing countries in Asia, Latin America and Africa. There are a few, however, located in the developed countries.

Among the largest 150 cities, 84 are in Asia, accounting for 46.4% of the sample cities in the region; 22 are in Latin America, accounting for 37.9%; 20 are in Africa, accounting for 55.6%; 15 are in Europe, accounting for 10.5%; 6 are in North America, accounting for 8.6%; 3 are in Oceania, accounting for 25%. Figure3.1 shows the distribution of the 150 most populated cities by region.



FigFigure 3.2 The distribution of the 150 most populated cities by region

Among the 150 least populated cities, 79 are in Europe, accounting for 55.2% of the sample cities of the region; 35 are in North America, accounting for 50%; 19 are in Asia, accounting for 10.5%; 7 are in Oceania, accounting for 58.3%; 5 are in Africa, accounting for 13.9%; 5 are in Latin America, accounting for 8.6%.

In terms of population, Asian, Latin American and African cities generally have larger size, and European and North American are smaller. With the urbanization of densely populated areas in Asia and Africa, an accelerated urbanization process as never seen before is underway worldwide.

4. Market structure of urban competition: oligarch monopoly

Market share is also an important index of competitiveness. For cities with both internal and external demands, GDP would be a good alternative of market share. Through the comparison of their GDPs, we could identify the market features of the competitiveness of individual cities.

4.1 The structure of an oligarch monopoly market

Wide gaps in GDP exist among the 500 sample cities. Tokyo ranks the first with a GDP of US$ 584.095 billion, and Groznyj, with a GDP of $ 17 million, is at the bottom of the list. The total GDP of the top 10 cities amounts to $ 3,121.71 billion, accounting for 27.1% of the total of all 500 cities, or close to the total GDP of the bottom 380 cities, which is $ 3,131.8 billion, or 27.2% of the total. The average GDP of the top 10 cities is $ 312.171 billion, while that of the bottom 380 cities is merely $ 8.24 billion. Table 1.5 indicates the GDP ranks of the 500 sample cities.

Table 4.1 Top 20 and bottom 20 cities of the 500 sample cities in terms of GDP (Unit: US $ Billions)

City	Country	Continent	GDP	Rank	City	Country	Continent	GDP	Rank
Tokyo	Japan	East Asia	584.95	1	Port Louis	Mauritius	South Africa	0.56	481
Paris	France	Western Europe	525.05	2	Windhoek	Namibia	South Africa	0.53	482
New York	US	North America	502.51	3	Freetown	Sierra Leone	West Africa	0.50	483
London	UK	Western Europe	446.20	4	Maputo	Mozambique	South Africa	0.49	484
Mexico City	Mexico	Latin America	220.08	5	Allahabad	India	South Asia	0.48	485

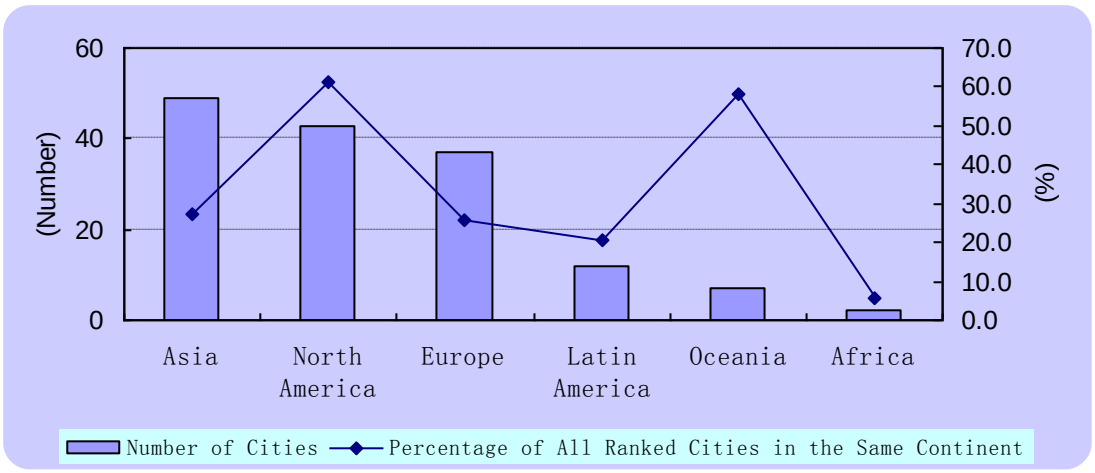
Los Angeles	US	North America	180.08	6	Mysore	India	South Asia	0.44	486
Hong Kong	China	East Asia	179.78	7	Haora	India	South Asia	0.43	487
Seoul	South Korea	East Asia	176.60	8	Niznij Novgorod	Russia	East Europe	0.42	488
Sydney	Australia	Oceania	171.69	9	Nasik	India	South Asia	0.42	489
Melbourne	Australia	Oceania	134.76	10	Asansol	India	South Asia	0.41	490
Chicago	US	North America	130.03	11	Djibouti	Djibouti	East Africa	0.39	491
Shanghai	China	East Asia	110.74	12	Lome	Togo	West Africa	0.33	492
Yokohama	Japan	East Asia	110.32	13	Labuan	Malaysia	Southeast Asia	0.31	493
Singapore	Singapore	Southeast Asia	109.31	14	Blantyre	Malawi	South Africa	0.31	494
Berlin	Germany	Central Europe	102.91	15	Georgetown	Guyana	Latin America	0.29	495
Toronto	Canada	North America	102.35	16	Victoria (SC)	Seychelles	East Africa	0.26	496
Madrid	Spain	Southern Europe	99.18	17	Vijayawada	India	South Asia	0.25	497
Houston	US	North America	98.91	18	Port Moresby	Papua New Guinea	Oceania	0.23	498
Osaka	Japan	East Asia	98.78	19	Dushanbe	Tajikistan	Central Asia	0.20	499
Rome	Italy	Southern Europe	90.52	20	Groznyj	Russia	East Europe	0.17	500

Note: the data of London covers the Greater London Region.

4.2 Substantial GDP gaps exist among cities in each continent

Large GDP is found in European, North American, Asian and Oceanian cities, which either have high GDP per capita or large population, or both. Relatively speaking, GDP of Latin American and African cities is small.

Among the top (most populous) 150 cities, 49 are in Asia, accounting for 27.1% of the sample cities of the region; 43 are in North America, accounting for 61.4%; 37 are in Europe, accounting for 25.9%; 12 are in Latin America, accounting for 20.7%; 7 are in Oceania, accounting for 58%; 2 are in Africa, accounting for 5.6%. Figure 1.6 shows the regional distribution of the top 150 cities.



FigFigure**4.1 The distribution of the top 150 cities by regions**

Among the bottom 150 cities, 67 are in Asia, accounting for 37% of the sample cities of the region; 48 are in Europe, accounting for 63.9%; 23 are in Africa, accounting for 38.9%; 10 are in Latin America, accounting for 17.2%; 1 is in North America, accounting for 1.4%; 1 is in Oceania, accounting for 8.3%. Figure 4.1 shows the regional distribution of the bottom 150

cities. See Table 1.5 below for the GDP ranks of the top 10 cities of 3 continents.

Table 4.2 GDP ranking of top 10 cities in North America, Asia and Europe

	North America			Asia			Europe		
Regional Rank	City	Country	Global Rank	City	Country	Global Rank	City	Country	Global Rank
1	New York	US	3	Tokyo	Japan	1	Paris	France	2
2	Los Angeles	US	6	Hong Kong	China	7	London	UK	4
3	Chicago	US	11	Seoul	South Korea	8	Berlin	Germany	15
4	Toronto	Canada	16	Shanghai	China	12	Madrid	Spain	17
5	Houston	US	18	Yokohama	Japan	13	Rome	Italy	20
6	Philadelphia	US	28	Singapore	Singapore	14	Manchester	UK	24
7	Montreal	Canada	30	Osaka	Japan	19	Moscow	Russia	25
8	San Diego	US	34	Nagoya	Japan	21	Vienna	Austria	26
9	Dallas	US	35	Istanbul	Turkey	22	Hamburg	Germany	31
10	Phoenix	US	38	Beijing	China	23	Leeds	UK	33

4.3 GDP levels vary substantially among cities in each country

GDP levels vary substantially among cities in each country, too. Figure 4.2 shows the difference between the highest and lowest city GDP in major countries. (This is, of course, affected by exchange rates, so be careful what you assert here)

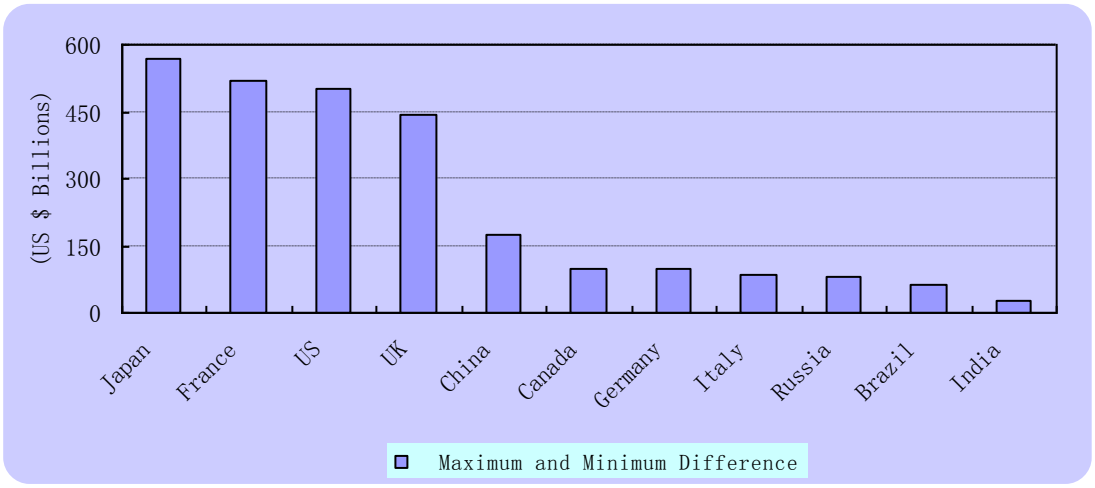


Figure 4.2 The difference between the highest and lowest city GDPs in major countries

In terms of the absolute figure, Japan has the widest city GDP gap — as wide as $ 569.22 billion; followed by France, $ 518.92 billion; the United States, $ 500.16 billion and Britain, $ 442.43 billion. Brazil has the narrowest gap, which is $ 62.61 billion. In terms of the ratio of the highest to the lowest city GDP, Russia tops the list with 19.7 times, followed by the United States, 12.4 times and Britain, 9.7 times. Italy and Canada, with 1.4 times and 1.3 times, are at the bottom of the list. In general, the United States and Britain has the largest difference in city GDP.

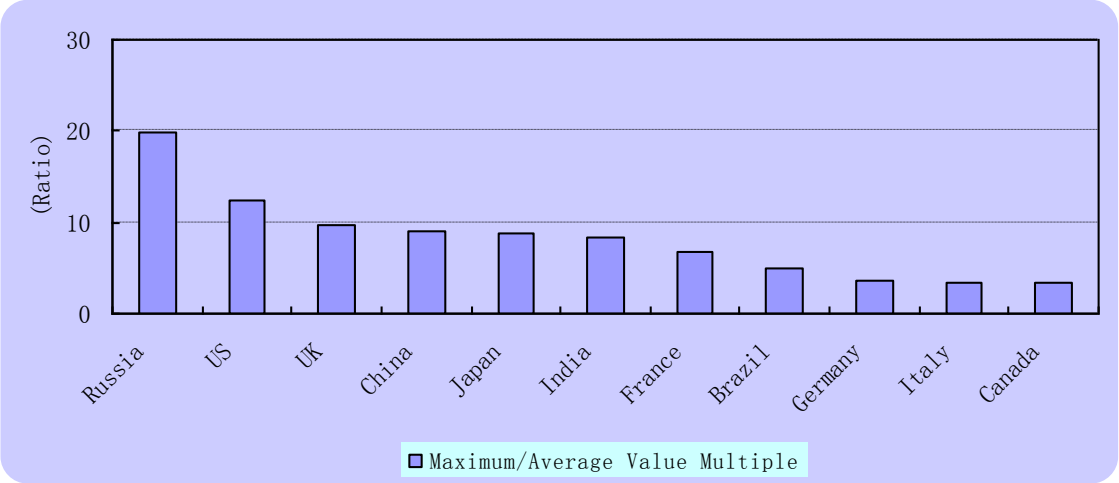


Figure4.3 The ratios of largest to lowest city GDP in major countries

5. Economic speed: there are distinct national characteristics with Chinese cities showing the highest growth rate

Economic growth, particularly the long-term economic growth is an important index of sustainable competitiveness of a city. GDP growth rate is an important index (indicator?) of the development growth rate.

5.1 Growth rates vary substantially among cities and Chinese cities have the highest speed

Average annual GDP growth rates of the cities during the 2001-2005 period vary substantially, with Baotou's 20.05% being the highest and Harare's -7.38% being the lowest. The average growth rate of the cities is 5.94% with 98 cities reporting growth rates higher than 10%, and 13 others reporting negative growth rates. Figure 1.9 and Table 1.6 show the economic growth rates of cities worldwide.

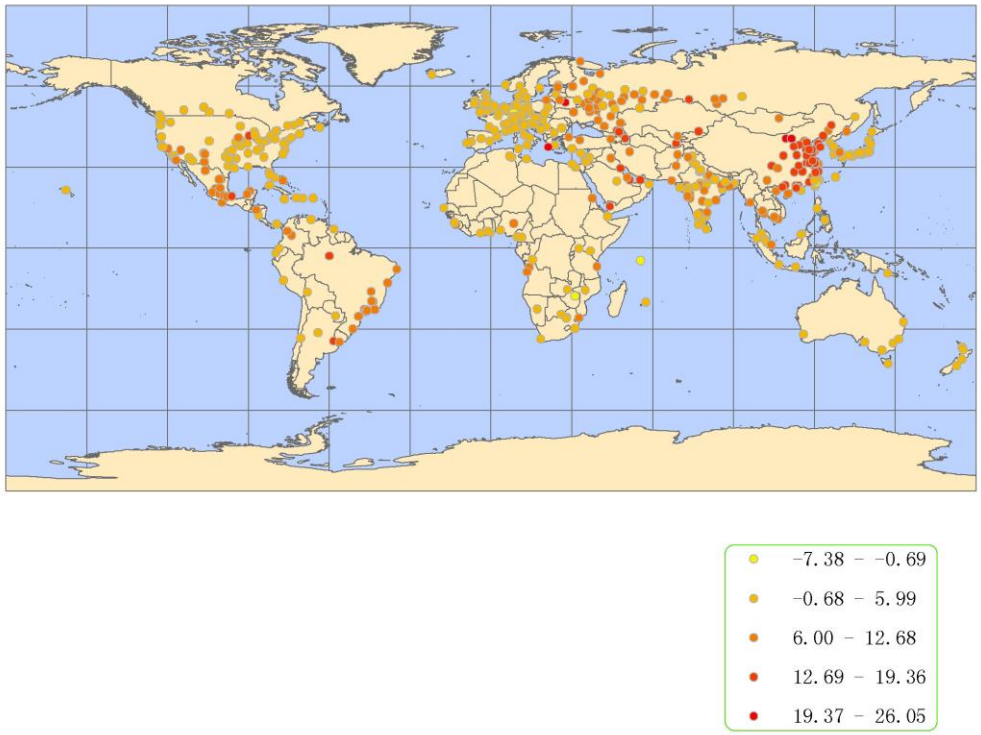


Figure 5.1 Economic growth rates of cities worldwide (Unit: percent)

Table 5.1 The top 20 and the bottom 20 cities in the 500 sample cities in terms of GDP growth rate (Unit: percent)

City	Country	Continent	GDP growth rate	Rank	City	Country	Continent	GDP growth rate	Rank
Baotou	China	East Asia	20.00	1	Nagoya	Japan	East Asia	0.10	481
Huhehaote	China	East Asia	20.00	2	Riga	Latvia	East Europe	0.09	482
Yantai	China	East Asia	19.57	3	Berlin	Germany	Central Europe	0.06	483
Dongguan	China	East Asia	19.25	4	Georgetown	Guyana	Latin America	0.04	484
Baku	Azerbaijan	West Asia	19.00	5	Basel	Switzerland	Central Europe	0.02	485
Zhongshan	China	East Asia	18.44	6	Kobe	Japan	East Asia	0.01	486
Huizhou	China	East Asia	18.11	7	Sarajevo	Bosnia and Herzegovina	Southeast Europe	0.00	487
Weifang	China	East Asia	17.98	8	Sakai	Japan	East Asia	-0.02	488
Wuhu	China	East Asia	17.97	9	Osaka	Japan	East Asia	-0.02	489
Manaus	Brazil	Latin America	17.96	10	Bern	Switzerland	Central Europe	-0.19	490
Weihai	China	East Asia	17.55	11	Sapporo	Japan	East Asia	-0.28	491
Hefei	China	East Asia	17.37	12	Taipei	China	East Asia	-0.30	492

Doha	Qatar	West Asia	17.35	13	Kanazawa	Japan	East Asia	-0.37	493
Rizhao	China	East Asia	17.34	14	Kitakyusyu	Japan	East Asia	-0.54	494
Nanchang	China	East Asia	17.18	15	New Orleans	United States	North America	-0.65	495
Veracruz	Mexico	Latin America	16.90	16	Okayama	Japan	East Asia	-0.86	496
Omsk	Russia	East Europe	16.74	17	Mainz	Germany	Central Europe	-0.97	497
Zibo	China	East Asia	16.74	18	Victoria (SC)	Seychelles	East Africa	-1.79	498
Shenzhen	China	East Asia	16.64	19	Taichung	China	East Asia	-2.43	499
Suzhou	China	East Asia	16.44	20	Harare	Zimbabwe	South Africa	-7.38	500

5.2 Western European and North American cities have maintained slow growth; some Asian cities are emerging as new growth centers; and some African cities continue to deteriorate

Substantial gaps in average GDP growth rates exist among cities in the 2001-2005. The average growth rate of Asian cities is the highest, 8.4%, followed by Latin America, 7.8%; Europe, 4.5% and Africa, 4.1%. At the bottom of the list are North America and Oceania, at 2.7% and 2.5% respectively. Among the cities with GDP growth rate higher than 10%, 72 cities are in Asia, 14 in Latin America, 11 in Europe (mainly in Russia) and 1 in Africa. None is in North America or Oceania. Among those with GDP growth rate lower than 2%, 44 cities are in Europe, 24 in North America, 22 in Asia (mainly in Japan), 5 in Latin America, 5 in Oceania and 5 in Africa. Figure 1.10 shows the average GDP growth rates of cities during the 2001-2005 by continent. Among the cities with negative growth, 6 are in Japan. In the Sub-Sahara regions, the average growth rate of the cities is as low as 1.82%, with 7 cities reporting negative growth.

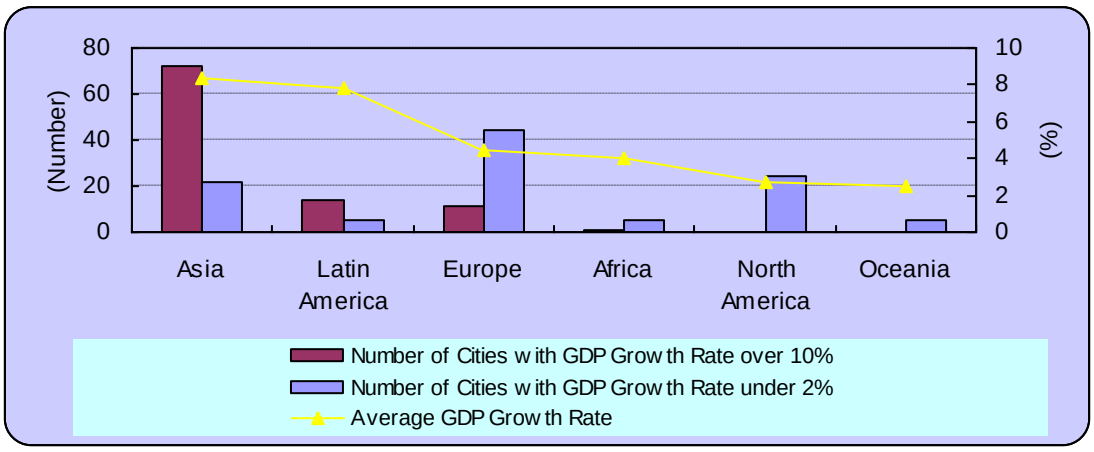


Figure 5.2 Average GDP growth rates of cities during 2001-2005 by continent

5.3 Cities in the core regions of the continents have slowed growth while those in the peripheral regions have been growing fast

In core regions of Europe, such as Britain and Germany, the average growth rates are as low as 2.65% and 1.72% respectively. In CIS states, such as Russia and Belarus, it is as high as 8.50%. In Asia, it is 0.51% in Japan, where 6 cities have reported negative growth, and up to 11.62% and 6.38 in China and India respectively. In the Americas, the average growth rates of US and Canadian cities are 2.65% and 2.78% respectively, while those of Mexico and Brazil are 10.73% and 9.21% respectively.

See the following table for top cities based on the 5-year average GDP growth rates of cities in the 3 continents.

Table 5.2 Top cities based on 5-year average GDP growth rates in North America, Asia and Europe

	North America			Asia			Europe		
Regional Rank	City	Country	Global Rank	City	Country	Global Rank	City	Country	Global Rank
1	Fresno	United States	129	Baotou	China	1	Omsk	Russia	17
2	El Paso	United States	174	Huhehaote	China	2	Machackala	Russia	56
3	Las Vegas	United States	186	Yantai	China	3	Groznyj	Russia	57
4	Arlington	United States	240	Dongguan	China	4	Minsk	Belarus	58
5	Fort Worth	United States	241	Baku	Azerbaijan	5	Lipeck	Russia	63
6	Sacramento	United States	242	Zhongshan	China	6	Belgorod	Russia	65
7	Long Beach	United States	262	Huizhou	China	7	T'umen	Russia	66
8	Oakland (US)	United States	267	Weifang	China	8	Moscow	Russia	71
9	Oklahoma City	United States	271	Wuhu	China	9	Saint Petersburg	Russia	90
10	Tucson	United States	272	Weihai	China	11	Kemerovo	Russia	92

5.4 Slow growth in cities of developed countries but fast economic growth in cities of emerging countries undergoing industrialization and transition

The GDP growth of some cities has distinct national chrematistics. In general, the GDP growth in cities of developed countries has been slow. For example, no GDP growth rate of a city in Britain, Germany, Japan, the United States and Canada exceeds 3%. On the other hand, countries undergoing industrialization or transition have maintained high growth. Developing countries, such as China, India, Mexico, Brazil and Russia have maintained GDP growth rates

higher than 6%. In some of the Latin American and African countries, both GDP growth rates and city development have been slow. In many developing countries, GDP has been growing in cities very slowly.

6. Development level: substantial spatial gaps and distinct regional groups exist

Economic development level is the foundation for the competitiveness and development of a city. GDP per capita is an important index of the development level of a city or a region.

6.1 Substantial gaps exist between regions in the world

In spite of the substantial gaps, GDP per capita of cities shows a normal distribution. Geneva is the city with the highest income per capita, which is $ 62,676.92 (2005), and Kinshasa has the lowest, which is $ 206.77. 22 cities have reported GDP per capita higher than $ 50,000; 162 higher than $ 30,000; 235 higher than $ 10,000; 299 higher than $ 5,000; and 47 lower than $ 1,000. Figure 6.1 and Table 6.1 show the incomes per capita of the cities worldwide.

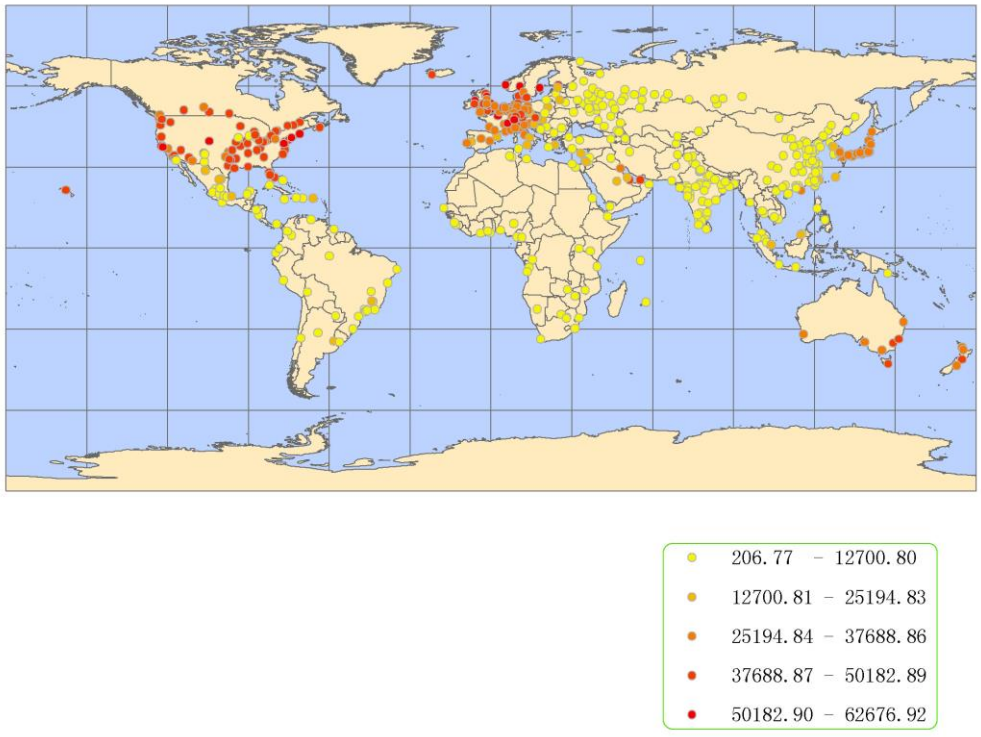


Figure 6.1 GDP per capita of cities in the world (Unit: $)

Table 6.1 The top 20 and the bottom 20 cities among the 500 sample cities in terms of GDP per capita (Unit: U$)

City	Country	Continent	GDP per capita	Rank	City	Country	Continent	GDP per capita	Rank
Geneva	Switzerland	Central Europe	62676.92	1	Madurai	India	South Asia	534.76	481
New York	United States	North America	61178.19	2	Agra	India	South Asia	477	482
Oakland (US)	United States	North America	60638.41	3	Kampala	Uganda	East Africa	473.6	483
Edinburgh	United Kingdom	Western Europe	59540.23	4	Meerut	India	South Asia	458.01	484

Washington	United States	North America	58548.98	5	Maputo	Mozambique	South Africa	454.76	485
London	United Kingdom	Western Europe	57948.69	6	Mysore	India	South Asia	448.2	486
Oslo	Norway	Northern Europe	57931.4	7	Pyongyang	North Korea	East Asia	444.6	487
Belfast	United Kingdom	Western Europe	56105.86	8	Blantyre	Malawi	South Africa	435	488
Basel	Switzerland	Central Europe	55247.85	9	Allahabad	India	South Asia	406.7	489
Zurich	Switzerland	Central Europe	54056	10	Haora	India	South Asia	370.61	490
Helsinki	Finland	Northern Europe	53920.26	11	Freetown	Sierra Leone	West Africa	370.17	491
Paris	France	Western Europe	53725.29	12	Lome	Togo	West Africa	361.14	492
Boston	United States	North America	53456.08	13	Yangon	Myanmar	Southeast Asia	360.95	493
San Jose	United States	North America	52990.76	14	Asansol	India	South Asia	331.75	494
San Francisco	United States	North America	52905.12	15	Nasik	India	South Asia	323.36	495
Stockholm	Sweden	Northern Europe	52812.58	16	Kabul	Afghanistan	West Asia	319.26	496
Nottingham	United Kingdom	Western Europe	51438.05	17	Addis Ababa	Ethiopia	North Africa	308.47	497
Bergen	Norway	Northern Europe	51169.84	18	Dushanbe	Tajikistan	Central Asia	302.5	498
Glasgow	United Kingdom	Western Europe	51044.35	19	Vijayawada	India	South Asia	251.4	499
Copenhagen	Denmark	Northern Europe	51001.45	20	Kinshasa	Zaire	Central Africa	206.77	500

Note: the data of London covers the Greater London Region; the Data of Rangoon covers the urban districts only.

6.2 North American and European cities have the highest levels of development

In terms of GDP per capita, all of the top 20 cities are in North America and Europe. Specifically, 6 are in North America and the rest are in West, Central and Northern Europe.

Among the top 150 cities, 68 are in North America, accounting for 97.1% of the sample cities of the region; 57 are in Europe, accounting for 39.9%; 16 are in Asia, accounting for 8.8%; 9 are in Oceania, accounting for 75%. None of the Latin American and African cities is on the top 150 list.

Among the bottom 150 cities, 83 are in Asia, accounting for 45.9% of the sample cities of the region; 32 are in Europe, accounting for 22.4%; 26 are in Africa, accounting for 72.2%; 8 are in Latin America, accounting for 13.8%; 1 in Oceania, accounting for 8.3%. None of the North American cities is on the bottom 150 list.

By region, North America and Oceania have the highest GDP per capita, which are $ 43,077.1 and $ 34,530.3 respectively, followed by Europe, $ 23,396.4; and Asia $ 9,087.4. Latin America and Africa have the lowest GDP per capita, which are $ 8,362.3 and $ 2,615.5 respectively. In general, GDP per capita of coastal cities are higher than those of inland cities. Figure 6.2 shows the average GDP per capita of cities in different regions. See table 1.9 for GDP per capita of cities in 3 major continents. The highest ranking city in Asia lags far behind those in Europe and North America.

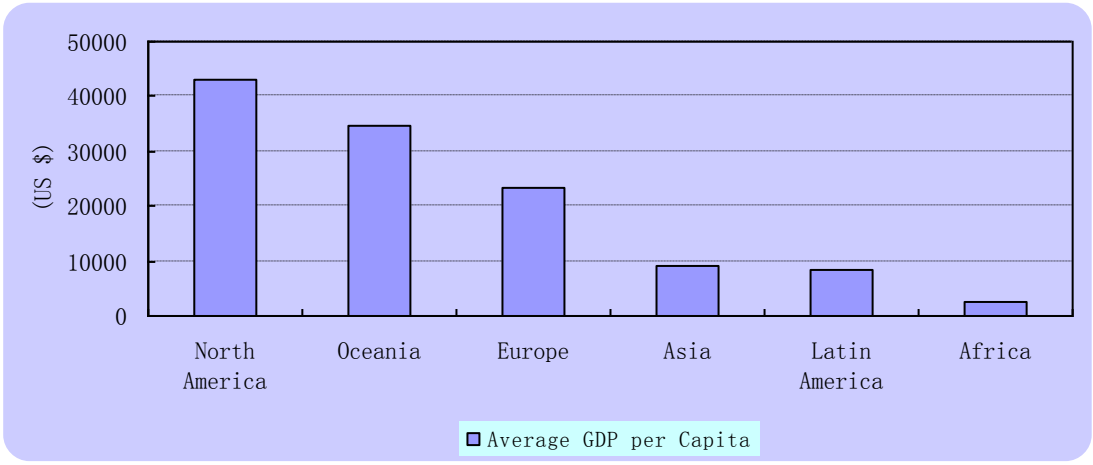


Figure 6.2 GDPs per capita of cities by continent

Table 6.2 Top 10 cities in terms of GDP per capita in North America, Asia and Europe

	North America			Asia			Europe		
Regional Rank	City	Country	Global Rank	City	Country	Global Rank	City	Country	Global Rank
1	New York	US	2	Tokyo	Japan	39	Geneva	Switzerland	1
2	Oakland	US	3	Doha	Qatar	58	Edinburgh	UK	4
3	Washington	US	5	Dubai	United Arab Emirates	80	London	UK	6
4	Boston	US	13	Nagoya	Japan	85	Oslo	Norway	7
5	San Jose	US	14	Osaka	Japan	106	Belfast	UK	8
6	San Francisco	US	15	Kyoto	Japan	110	Basel	Switzerland	9
7	Dallas	US	21	Shizuoka	Japan	111	Zurich	Switzerland	10
8	Denver	US	22	Kanazawa	Japan	117	Helsinki	Finland	11
9	Seattle	US	23	Akita	Japan	120	Paris	France	12
10	Minneapolis	US	24	Ulsan	South Korea	122	Stockholm	Sweden	16

6.3 North American and European cities have the highest development level

Among the top 150 cities, 56 are in the United States, accounting for 98.2% of the sample cities of the nation; 16 are in Britain, accounting for 55.6%; 13 are in Japan, accounting for 59.1%; 13 are in Germany, accounting for 76.5%; 12 are in Canada, accounting for 92.3%; 8 are in France, accounting for 100%; 3 are in Italy, accounting for 33.3%.

Among the bottom 150 cities, none is in G7 countries; 43 are in India, accounting for

100% of its sample cities; 31 are in Russia, accounting for 62%; 16 are in China (including Taiwan), accounting for 25.8%; 1 in Brazil, accounting for 6.7%.

7. Economic concentration: uneven spatial distribution and unclear regional grouping

Economic concentration enables economies to benefit from external economies and improve their efficiency. GDP per square kilometer is an important index of output concentration resulting from the concentration of production factors.

7.1 Substantial spatial gaps exist and both large and small cities are among the top cities

Figure 7.1 and Table 7.1 show that, the GDP per square kilometer ranking is not like that of GDP per capita. On the top ranking list, there are both large and small cities. Specifically, 6 of the cities are in Asia, 7 in North America and 7 in Europe, indicating an even geographical distribution.

Table 7.1The top 20 and bottom 20 cities in the 500 sample cities in terms of GDP per square kilometer

(Unit: $ Thousands)

City	Country	Continent	GDP per square kilometer	Rank	City	Country	Continent	GDP per square kilometer	Rank
New York	US	North America	643498.2	1	Abidjan	Cote d'ivoire	West Africa	761.3	481
Geneva	Switzerland	Central Europe	633715.1	2	Pyongyang	North Korea	East Asia	744.93	482
Victoria(CA)	Canada	North America	565083.3	3	Thane	India	South Asia	678.01	483
Macao	China	East Asia	482636.2	4	Rabat	Morocco	North Africa	626.23	484
Lyon	France	Western Europe	337620.8	5	Meerut	India	South Asia	611.23	485
San Francisco	US	North America	326156.5	6	Victoria(SC)	Seychelles	East Africa	562.43	486
Manchester	UK	Western Europe	309761.2	7	Vijayawada	India	South Asia	557.4	487
San Juan	Puerto Rico	Latin America	302016.4	8	Amritsar	India	South Asia	530.43	488
Nottingham	UK	Western Europe	300355.8	9	Indore	India	South Asia	517.03	489
Kawasaki	Japan	East Asia	296998.8	10	Varanasi	India	South Asia	512.24	490
Seoul	South Korea	East Asia	291700.6	11	Asansol	India	South Asia	507.62	491
London	UK	Western Europe	278009.3	12	Agra	India	South Asia	480.86	492
Milan	Italy	Southern Europe	275183	13	Allahabad	India	South Asia	414.93	493
Nagoya	Japan	East Asia	274949.6	14	Visakhapatnam	India	South Asia	402.4	494
Tokyo	Japan	East Asia	267458.6	15	Jabalpur	India	South Asia	256.59	495
Boston	US	North America	260997.8	16	Rajkot	India	South Asia	185.31	496
Yokohama	Japan	East Asia	253615.2	17	Ulan Bator	Mongolia	East Asia	152.09	497
Wilmington	US	North America	252058.8	18	Kinshasa	Zaire	Central Asia	125.51	498
Bristol	UK	Western Europe	247874.5	19	Groznyj	Russia	East Europe	55.97	499
Honolulu	US	North America	247117	20	Djibouti	Djibouti	East Africa	49.01	500

Note: the data of London covers the Greater London Region.

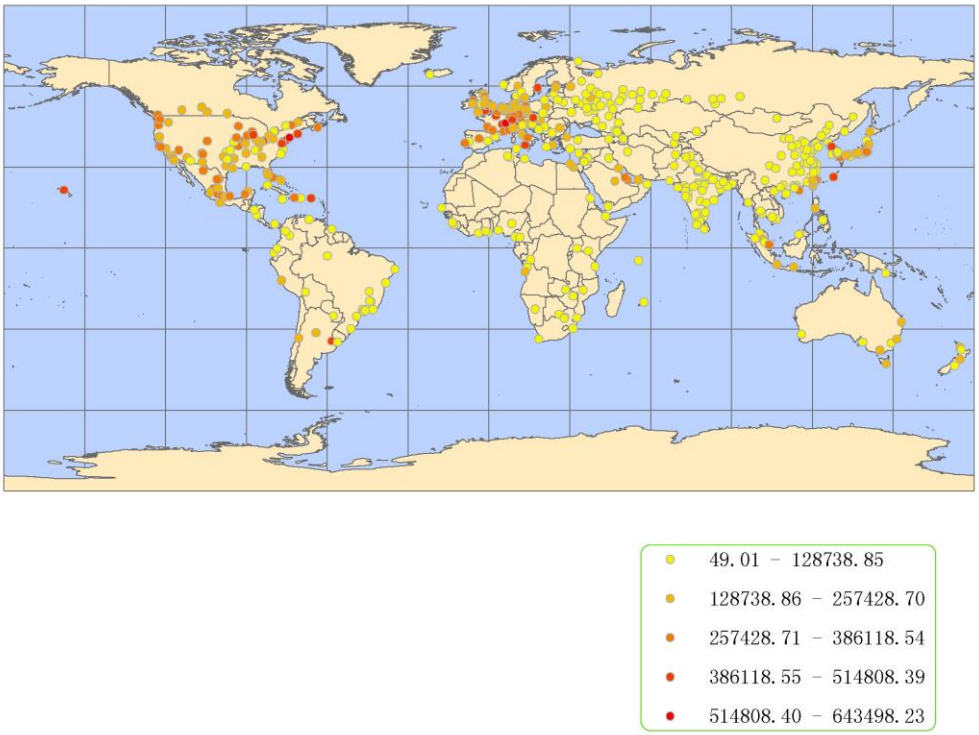


Figure 7.1 GDP per square kilometer of cities worldwide (Unit: $ thousands)

7.2 Continental top cities are largely close with substantial gaps between continental average cities

See the following table for the GDP per square kilometer ranks of cities in 3 major continents. Asia's top ranking cities are close to those of Europe and North America. Similarly, most of the high-ranking cities in terms of GDP per square kilometer are in Europe, North America and Asia.

Table 7.2 Top 10 cities in North America, Asia and Europe in terms of GDP per square kilometer

North America				Asia				Europe	
Regional Rank	City	Country	Global Rank	Regional Rank	City	Country	Global Rank	Regional Rank	City
1	New York	United States	1	Macao	China	4	Geneva	Switzerland	2
2	Victoria	Canada	3	Kawasaki	Japan	10	Lyon	France	5
3	San Francisco	United States	6	Seoul	South Korea	11	Manchester	United Kingdom	7
4	Boston	United States	16	Nagoya	Japan	14	Nottingham	United Kingdom	9
5	Wilmington	United States	18	Tokyo	Japan	15	London	United Kingdom	12
6	Honolulu	United States	20	Yokohama	Japan	17	Milan	Italy	13
7	Chicago	United States	23	Okinawa	Japan	29	Bristol	United Kingdom	19
8	Washington	United States	27	Sakai	Japan	31	Basel	Switzerland	21
9	Philadelphia	United States	28	Tel Aviv	Israel	41	Palermo	Italy	22
10	Vancouver	Canada	37	Hong Kong	China	46	Turin	Italy	24

North America and Europe have the highest average GDP per square kilometer, which are

$ 107,576,100 and $72,854,530 respectively, followed by Oceania, $ 42,128,520; Latin America, $ 60,499,960; Asia, $ 34,087,390 and Africa, $ 10,778,990. The GDP per square kilometer of the lowest ranking cities in Latin America and Africa are as low as $ 8,362.3 and US$ 2,615.5 respectively (see Figure 7.2).

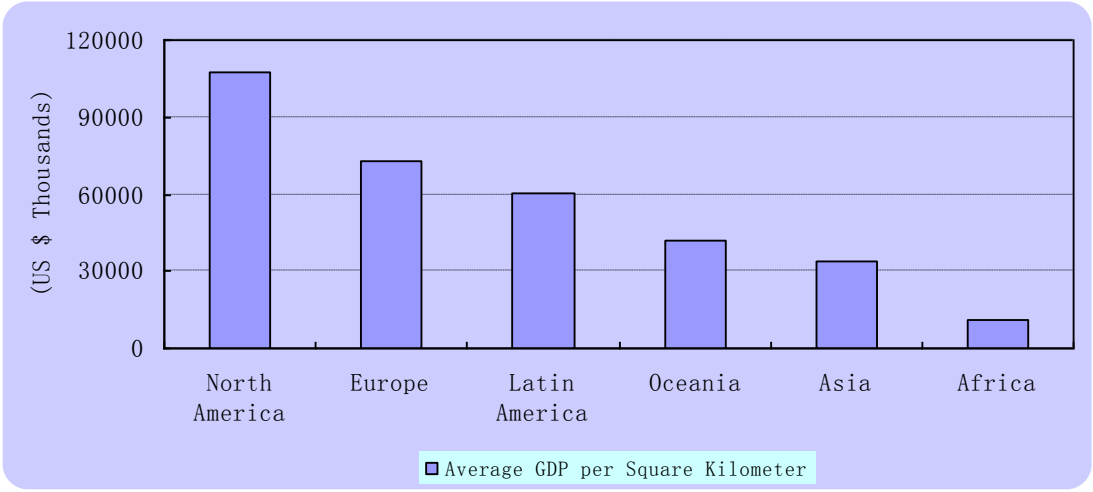


Figure 7.2 GDP per square kilometer of cities by continent

7.3 North American and Oceania cities generally have high rankings and narrow gaps while Asian, African and South American cities have wide gaps with a few top cities

Among the top 150 cities, 58 are in Europe, accounting for 40.6% of the sample cities of the region; 38 are in North America, accounting for 54.3%; 26 are in Latin America, accounting for 44.8%; 22 are in Asia, accounting for 12.2%; 4 are in Oceania, accounting for 33.3%; 2 are in Asia, accounting for 5.6%. Figure 1.14 shows the regional distribution of the top 150 cities.

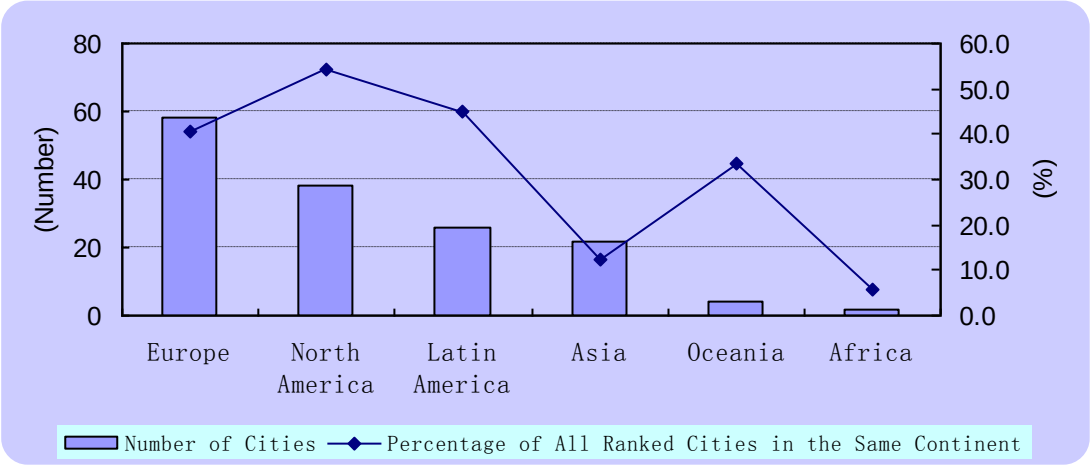


Figure 1.15 GDP per square kilometer of the top 150 cities by continent

Among the bottom 150 cities, 80 are in Asia, accounting for 44.2% of the sample cities of the region; 36 are in Europe, accounting for 25.2%; 22 are in Africa, accounting for 61.1%; 9 are in Latin America, accounting for 15.5%; 3 are in Oceania, accounting for 25%; none of the North American cities is on the bottom 150 of the rankings.

8. Employment: cities in transitional and industrializing countries have the highest ranking

Employment rate of urban residents is closely connected with the macro-economic situation of a nation. In general, countries undergoing transition and industrialization, e.g., China, Russia and Mexico have higher employment rates. Table 8.1 shows the employment rates of selected cities.

Table 8.1 The top 20 and bottom 20 cities in the 500 sample cities in terms of employment rate

(Unit: percent)

City	Country	Continent	Employment rate	Rank	City	Country	Continent	Employment rate	Rank
Moscow	Russia	East Europe	99.20	1	Conakry	Guinea	West Africa	70.00	481
Tijuana	Mexico	Latin America	99.10	2	Lome	Togo	West Africa	70.00	482

Baku	Azerbaijan	West Asia	99.02	3	Freetown	Sierra Leone	West Africa	70.00	483
Acapulco	Mexico	Latin America	99.00	4	Yaounde	Cameroon	Central Africa	70.00	484
Quanzhou	China	East Asia	98.83	5	Johannesburg	South Africa	South Africa	69.20	485
Oakland (US)	United States	North America	98.67	6	Windhoek	Namibia	South Africa	69.00	486
Al Kuwayt	KUWAIT	West Asia	98.51	7	Addis Ababa	Ethiopia	North Africa	68.60	487
Minsk	Belarus	East Europe	98.50	8	Belgrade	Srbija	Southeast Europe	68.40	488
Shenzhen	China	East Asia	98.40	9	Durban	South Africa	South Africa	67.00	489
Huizhou	China	East Asia	98.20	10	Sanaa	Yemen	West Asia	65.00	490
Weihai	China	East Asia	98.09	11	Nairobi	Kenny	North Africa	60.00	491
Dushanbe	Tajikistan	Central Asia	98.00	12	Luanda	Angola	South Africa	60.00	492
Victoria(SC)	Seychelles	East Africa	98.00	13	Kampala	Uganda	East Africa	57.00	493
Beijing	China	East Asia	97.92	14	Sarajevo	Bosnia and Herzegovina	Southeast Europe	56.00	494
San Luis Potosi	Mexico	Latin America	97.90	15	Port-au-Prince	Haiti	Latin America	50.00	495
Saint Petersburg	Russia	East Europe	97.80	16	Harare	Zimbabwe	South Africa	50.00	496
Dongguan	China	East Asia	97.76	17	Kinshasa	Zaire	Central Asia	50.00	497
Merida	Mexico	Latin America	97.70	18	Djibouti	Djibouti	East Africa	41.00	498
Morelia	Mexico	Latin America	97.70	19	Brazzaville	Congo	Central Asia	40.00	499
Arlington	United States	North America	97.69	20	Groznyj	Russia	East Europe	25.80	500

In the less developed African countries and warring countries in Europe and Asia, e.g., the sub-Sahara regions and Southeast Europe and the Middle East regions, urban employment rates tend to be low. The bottom 20 cities on the employment ranking list are, sequentially: Lome, Blantyre, Freetown, Kabul, Johannesburg, Windhoek, Addis Ababa, Belgrade, Durban, Sana'a, Luanda, Nairobi, Kampala, Sarajevo, Port-au-Prince, Harare, Kinshasa, Djibouti, Brazzaville and Grozny. In Russia’s Chechen Republic, the employment rate is as low as 25.8%. In Djibouti, it is 41%, and in Brazzaville, 40%.

In developed countries, the employment rate is generally maintained at a high level. However, some individual cities in these countries have relatively low employment rates, for example, 86.8% in Lille, France, 79.5% in Detroit, the United States, 79.2% in Leipzig and 78.5% in Berlin, Germany and 77.79% in Naples, Italy.

See the following table for the top 10 cities in 3 major continents. It indicates that Asian, particularly Chinese cities have the highest employment rates.

Table 8.2 Top 10 cities in North America, Asia and Europe in terms of employment rate

	North America			Asia			Europe		
Regional Rank	City	Country	Global Rank	City	Country	Global Rank	City	Country	Global Rank
1	Oakland	US	6	Baku	Azerbaijan	3	Moscow	Russia	1
2	Arlington	US	20	Quanzhou	China	5	Minsk	Belarus	8
3	Fort Worth	US	21	Al Kuwayt	Kuwait	7	Saint Petersburg	Russia	16
4	El Paso	US	24	Shenzhen	China	9	Chester	UK	30
5	Tucson	US	27	Huizhou	China	10	Reykjavik	Iceland	43
6	Long Beach	US	32	Weihai	China	11	Kiev	Ukraine	50

7	Fresno	US	39	Dushanbe	Tajikistan	12	Norwich	UK	59
8	Omaha	US	51	Beijing	China	14	Prague	Czech republic	66
9	Virginia Beach	US	62	Dongguan	China	17	Nottingham	UK	78
10	Oklahoma City	US	70	Zhuhai	China	22	Sofia	Bulgaria	94

9. Labor productivity：North American and European cities are leading cities

9.1 Substantial productivity gaps exist among cities in the world

On the top of this list is London, $ 161,120.66, which is 317.6 times of Dushanbe's $ 507.26, the bottom city. The average level of the top 10 cities in terms of productivity is $ 128,487.0, which is 158.5 times of that of the bottom 10 cities on the list, $ 810.9. The average level of the top 150 cities is $ 86,301.9, which is 21 times of that of the bottom 150 cities, $ 4,114.063. Figure 9.1 and Table 1.14 show productivity ranks of cities worldwide.

Table 9.1 The top 20 and bottom 20 cities in the 500 sample cities in terms of productivity (Unit: US $)

City	Country	Continent	Productivity	Rank	City	Country	Continent	Productivity	Rank
London	United Kingdom	Western Europe	161120.7	1	Agra	India	South Asia	1543.21	481
New York	United States	North America	141880.7	2	Rajkot	India	South Asia	1535.2	482
Detroit	United States	North America	141259.2	3	Meerut	India	South Asia	1465.09	483
New Orleans	United States	North America	126097.1	4	Blantyre	Malawi	South Africa	1435.74	484
Philadelphia	United States	North America	124986.8	5	Madurai	India	South Asia	1353.76	485
Boston	United States	North America	121893.5	6	Allahabad	India	South Asia	1278.36	486
Cleveland	United States	North America	119658.1	7	Maputo	Mozambique	South Africa	1253.57	487
Oslo	Norway	Northern Europe	118069.9	8	Mysore	India	South Asia	1252.2	488
San Jose	United States	North America	116237.8	9	Freetown	Sierra Leone	West Africa	1252.08	489
Baltimore	United States	North America	113666.5	10	Lome	Togo	West Africa	1203.81	490
Stockholm	Sweden	Northern Europe	112377.1	11	Haora	India	South Asia	1199.18	491
Helsinki	Finland	Northern Europe	111562.7	12	Kinshasa	Zaire	Central Africa	1198.67	492
Oakland(US)	United States	North America	111534.6	13	Asansol	India	South Asia	1027.41	493
Buffalo	United States	North America	109947.1	14	Kabul	Afghanistan	West Asia	894.27	494
Houston	United States	North America	109813.6	15	Nasik	India	South Asia	813.95	495
Glasgow	United Kingdom	Western Europe	108941.1	16	Addis Ababa	Ethiopia	North Africa	697.15	496
Chicago	United States	North America	108559.2	17	Yangon	Myanmar	Southeast Asia	660.98	497
Nice	France	Western Europe	108162.2	18	Vijayawada	India	South Asia	600.48	498
Atlanta	United States	North America	107250.7	19	Pyongyang	North Korea	East Asia	509.34	499
Marseille	France	Western Europe	106964.2	20	Dushanbe	Tajikistan	Central Asia	507.26	500

Note: the data of London covers the Greater London Region.

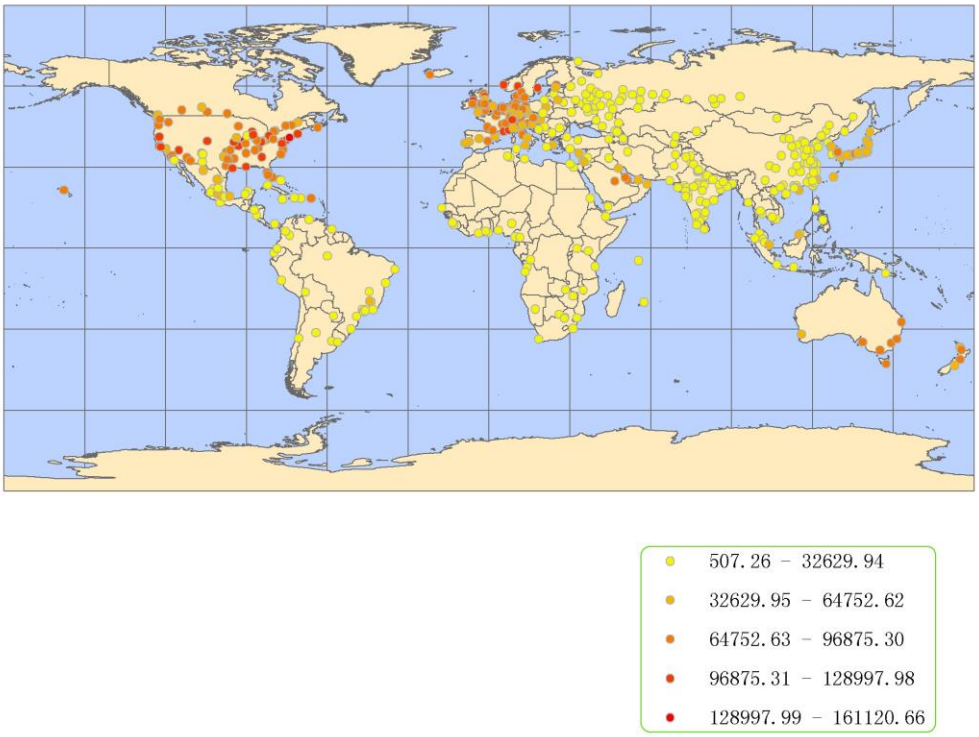


Figure 8.1 Labor productivities of cities in the world (Unit: US $)

9.2 North American, European and East Asian cities have higher productivity levels than African and Latin American cities

Similar to the case of GDP per capita, most cities with high productivity levels are in Europe and North America. Among the top 20 cities, 13 are in North America and 7 are in Europe.

Among the top 150 cities, 66 are in North America, accounting for 94.3% of the sample cities of the region; 60 are in Europe, accounting for 42%; 14 are in Asia, accounting for 7.7%; 9 are in Oceania, accounting for 75%; 1 is in Latin America, accounting for 1.7%; none of the African cities is on the top 150 list. Figure 9.2 shows the distribution of the 150 most productive cities by continent.

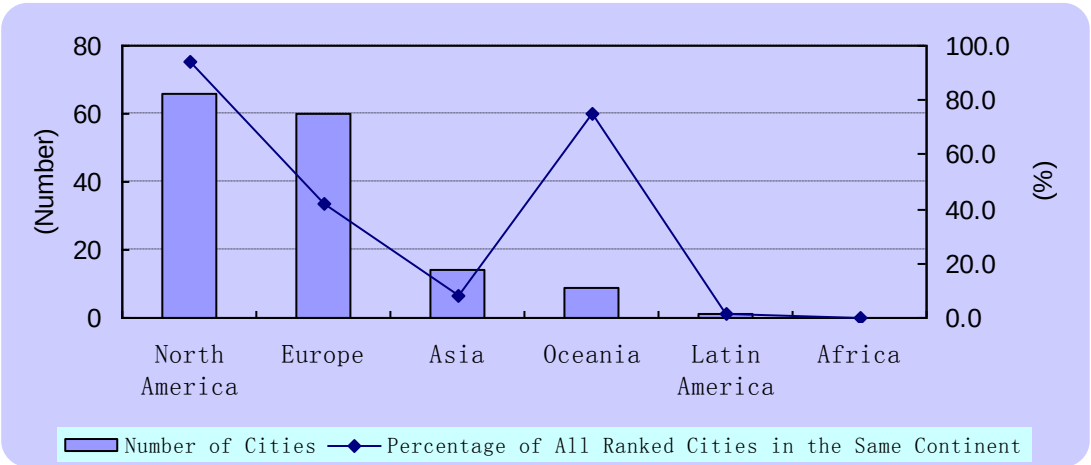


Figure 9.2 The distribution of the 150 most productive cities by continent

Among the bottom 150 cities, 80 are in Asia, accounting for 44.2% of the sample cities of the region; 34 are in Europe, accounting for 23.8%; 24 are in Africa, accounting for 66.7%; 11 are in Latin America, accounting for 19%; 1 is in Oceania, accounting for 8.3%; none of the North American cities is on the bottom 150 list.

Statistics for the top 10 cities of the 3 major continents (see the following table) indicate that the North American cities maintain an absolute leadership, and that the Asian cities have a long way to go.

Table 9.2 Top 10 cities in North America, Asia and Europe in terms of labor productivity

	North America			Asia			Europe		
Regional Rank	City	Country	Global Rank	City	Country	Global Rank	City	Country	Global Rank
1	New York	US	2	Tokyo	Japan	69	London	UK	1
2	Detroit	US	3	Ulsan	South Korea	91	Oslo	Norway	8
3	New Orleans	US	4	Nagoya	Japan	110	Stockholm	Sweden	11
4	Philadelphia	US	5	Osaka	Japan	114	Helsinki	Finland	12
5	Boston	US	6	Manama	Bahrain	125	Glasgow	UK	16
6	Cleveland	US	7	Okayama	Japan	126	Nice	France	18
7	San Jose	US	9	Kyoto	Japan	128	Marseille	France	20
8	Baltimore	US	10	Kanazawa	Japan	130	Edinburgh	UK	22
9	Oakland	US	13	Doha	Qatar	134	Rotterdam	Netherland	24
10	Buffalo	US	14	Shizuoka	Japan	137	Copenhagen	Denmark	26

9.3 US cities maintain an aboslute leadership while Indian cities have extremely low productivity levels

Among the top 20 cities, 13 are in the United States; 2 are in Britain and 2 are in France. 10 of the bottom 20 cities are in India.

Among the top 150 cities, 114 are in the G7 countries; none is in the four BRIC countries. Specifically, 54 are in the United States, accounting for 94.7% of the sample cities of the country; 14 are in Britain, accounting for 77.8%; 14 are in Germany, accounting for 82.4%; 12 are in Canada, accounting for 92.3%; 10 are in Japan, accounting for 45.5%; 8 are in France, accounting for 100%; and 2 are in Italy, accounting for 22.2%. (See Figure 9.3)

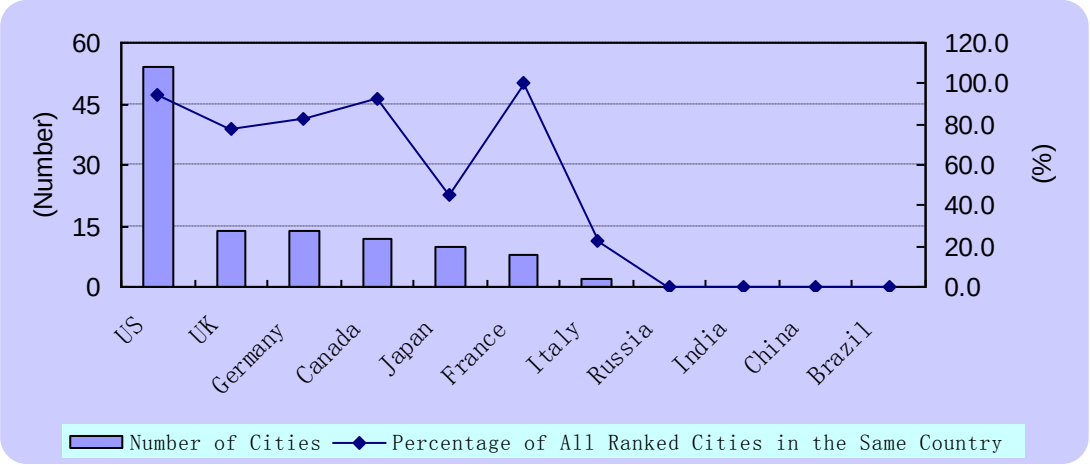


Figure **9.3 The distribution of the most productive 150 by country**

Among the bottom 150 cities, none is in the G7 countries; 95 are in the four BRIC countries. Specifically, 43 are in India, accounting for 100 of the sample cities of the country; 43 are in India, accounting for 100%; 33 are in Russia, accounting for 66%; 16 are in China (including Taiwan), accounting for 25.8%; and 3 are in Brazil, accounting for 20%.

10. Technical innovation is dominated by major cities in developed countries, while many cities in developing countries are rising fast

Technological innovation is the core part of a city's competitiveness. The results of technical innovation are important reflections of the competitiveness. The number of patent applications is one of the key indexes of urban competitiveness, if not all about it.

10.1 Most of the world's innovation centers are in world cities and central hi-tech cities

The top 20 cities in terms of patent application are Tokyo, Osaka, Paris, London, New York, Seoul, Stuttgart, San Diego, San Jose, Stockholm, Wilmington, Houston, Yokohama, Washington, Palo Alto, Kawasaki, San Francisco, Chiba, Berlin and Kyoto.

The number of patent applications of some cities, including Bryansk, Oronez, Lipeck, Ryazan, Archangelsk, Machackala, Groznyj, Astra Chan, Niznij Novgorod, Uljanovsk, T'umen, Cel'abinsk, Chabarovsk, Kanpur, Surat, Nagpur, Bhopal, Ludhiana, Asansol, Haora, Pimpri-Chichwad, Cochi, Ghaziabad, Srinagar and Vijayawada is almost zero.

Analysis indicates that most of the world's innovation centers are world cities and central hi-tech cities in major countries. In spite of the fast rise of some of the central cities, most other cities in the peripheral regions remain weak in terms of innovation capability. Figure 10.1 shows the distribution of technical innovation cities worldwide.

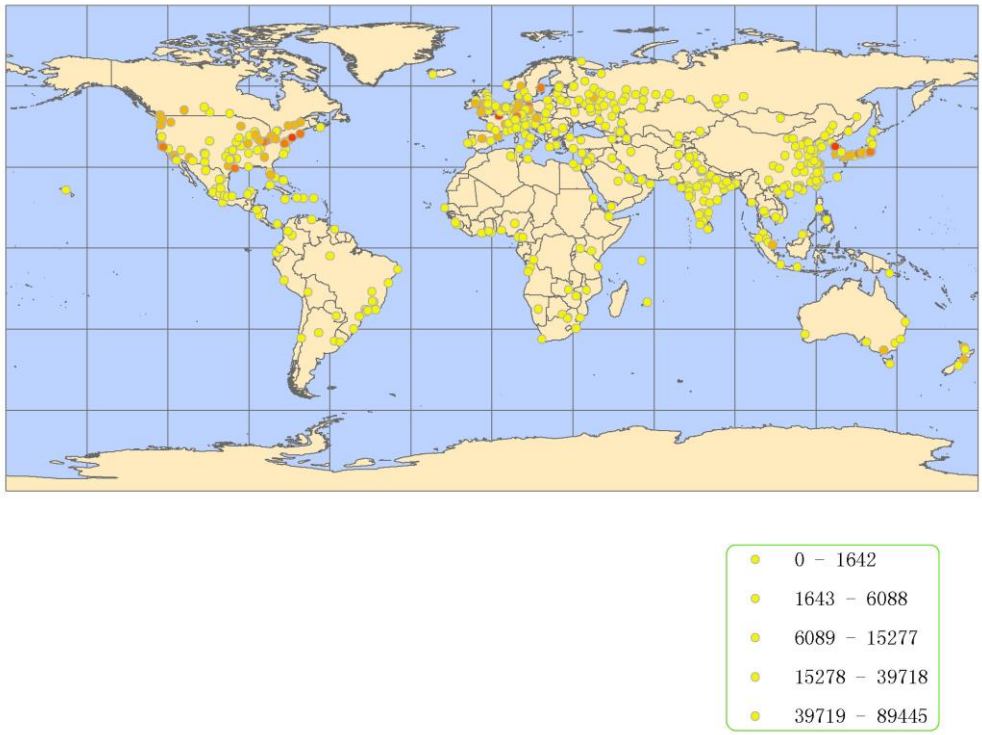


Figure10.1 International patent applications by cities worldwide (Unit: number)

10.2 North American, European and East Asian cities dominate the list

Among the top 20 cities in terms of patent applications, 8 are in North America, 8 are in East Asia, 2 are in Western Europe, 2 are in Central Europe and 1 is in Northern Europe.

Among the top 150 cities, 57 are in Europe, accounting for 39.9% of the sample cities of the region; 51 are in North America, accounting for 72.9%; 32 are in Asia, accounting for 17.7%; 6 are in Oceania, accounting for 50%; 2 are in Latin America, accounting for 3.4%; and 2 are in Africa, accounting for 5.6%. Figure 10.2 shows the distribution of the top 150 cities by continent.

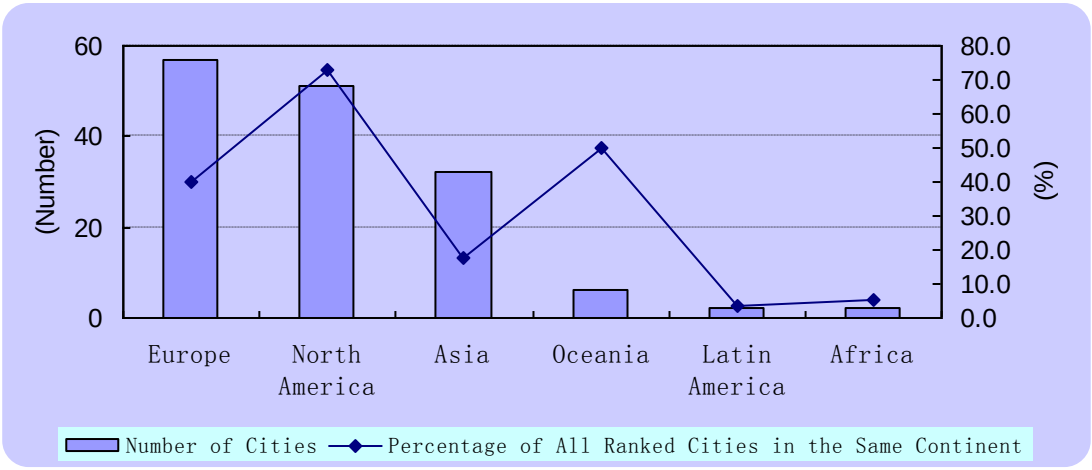


Figure **10.2 The distribution of the 150 most innovative cities by continent**

Among the bottom 150 cities, 68 are in Asia, accounting for 37.6% of the sample cities of the region; 35 are in Europe, accounting for 24.5%; 23 are in Latin America, accounting for

39.7%; 22 are in Africa, accounting for 61.1%; 2 are in Oceania, accounting for 16.7%; none is in North America.

The continental top 10 lists indicate that Asia, North America and Europe are roughly at the same level in terms of technical innovation. However, within these regions, technical innovations are mostly made in developed countries, for example, the United States and Japan.

Table 10.1 Top 10 cities in North America, Asia and Europe in terms of technical innovation

	North America			Asia			Europe		
Regional Rank	City	Country	Global Rank	City	Country	Global Rank	City	Country	Global Rank
1	New York	US	5	Tokyo	Japan	1	Paris	France	3
2	San Diego	US	8	Osaka	Japan	2	London	UK	4
3	San Jose	US	9	Seoul	South Korea	6	Stuttgart	Germany	7
4	Wilmington	US	11	Yokohama	Japan	13	Stockholm	Sweden	10
5	Houston	US	12	Kawasaki	Japan	16	Berlin	Germany	19
6	Washington	US	14	Chiba	Japan	18	Dusseldorf	Germany	22
7	Palo Alto	US	15	Kyoto	Japan	20	Basel	Switzerland	24
8	San Francisco	US	17	Shizuoka	Japan	29	Frankfurt	Germany	25
9	Cincinnati	US	21	Shenzhen	China	33	Hamburg	Germany	26
10	Boston	US	23	Nagoya	Japan	37	Helsinki	Finland	28

10.3US and Japanese cities have the greatest capacity for technical innovation while many central cities in South Korea, China and India are catching up fast

In terms of technical innovation, developed countries remain the dominating power. Among the top 20 cities, 8 are in the United States and 6 are in Japan. Among the top 150 cities, most are in the G7 countries. Specifically, 44 are in the United States, accounting for 77.2% of the sample cities of the country; 16 are in Japan, accounting for 72.7%; 15 are in Britain, accounting for 83.3%; 14 are in Germany, accounting for 82.4%; 7 are in Italy, accounting for 53.8%; 5 are in France, accounting for 62.5%; and 3 are in Italy, accounting for 33.3%. Among the four BRIC countries, China (including Taiwan) have 5 entries on the list, accounting for 8.1% of its sample cities; India has 4, accounting for 9.3%; Russia has 2; accounting for 4%; and Brazil has none (see Figure10.3)

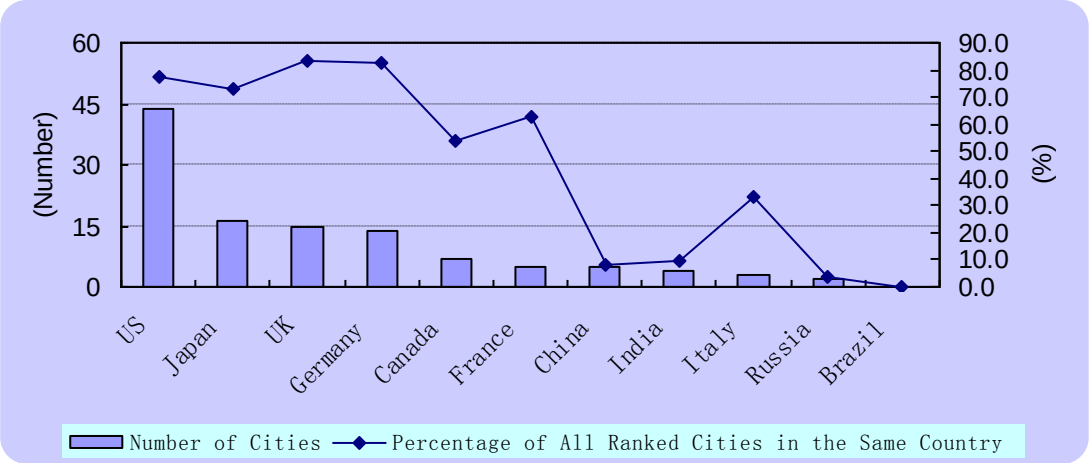


Figure 10.3 The distribution of the most innovative 150 by country

Among the bottom 150 cities, none is in the G7 countries, and 87 are in the four BRIC countries. Specifically, 33 are in Russia, accounting for 66% of the sample cities of the country; 25 are in India, accounting for 58.1%; 17 are in China (including Taiwan), accounting for 27.4%; and 5 are in Brazil, accounting for 33.3%.

Some cities in emerging industrializing developing countries are rising as world innovation centers and innovative cities. Notably, Seoul ranks No.6, Shenzhen No.33, Singapore No.41, Shanghai No.47 and Bombay No.49 on the list.

11. Economic control center: new evolution underway

Economic decision making power is the ability of a city to control the global economy resulting from global competition within the context of globalization. The ability is a reflection of the competitiveness of a city. One of the most important indexes of economic control is the distribution or the number of multinational companies.

11.1 Wide gaps exist in the economic control power among cities in the world, as the trends of concentration and deconcentration become increasingly clear

Wide gaps exist in economic control power among cities in the world. Cities are becoming increasingly different. While a few cities get very high scores, many others get extremely low scores. The total scores of the top 10 and top 150 cities account for 12.5% and 72.2% of that of all 500 cities respectively. The total scores of the bottom 150 cities account for merely 4.7% of that of all 500 cities.

World cities, e.g., New York, London, Tokyo, Paris and Hong Kong have powerful economic control. Total score of these cities accounts for as much as 7.2% of that of all 500 cities, indicating a distinct feature of concentration. In the meantime, the trend of deconcentration is becoming increasingly clear, too. That means the capitals and economic centers of many developing countries, e.g., Singapore, Beijing, Shanghai and Moscow are among the top 10, while Taipei, Seoul, Bombay, Bangkok, Buenos Aires, Mexico City and Dubai have high ranks, too.

Geographic location has considerable impact on the economic control power of a city. In this aspect, coastal cities, with natural advantages, have attracted more multinational companies, which contributed to the improvement of their economic decision making power.

These cities have considerable advantages over the inland cities. Yet a further examination reveals that, many inland cities, for example, Beijing, Frankfurt and Delhi have very high scores, too. Figure 11.1 and Table 1.17 show the distribution of world cities with high and low ranks.

Table 11.1 The top 20 and bottom 20 cities in the 500 cities in terms of the presence of multinational companies

City	Country	Continent	Numerical Value	Rank	City	Country	Continent	Numerical Value	Rank
New York	US	North America	20.00	1	Sao Jose dos Campos	Brazil	Latin America	5	481
London	UK	Western Europe	20.00	2	Kalyan	India	South Asia	5	482
Hong Kong	China	East Asia	19.57	3	Sao Bernardo do Campo	Brazil	Latin America	5	483
Paris	France	Western Europe	19.25	4	Tver	Russia	East Europe	5	484
Tokyo	Japan	East Asia	19.00	5	Vladimir	Russia	East Europe	5	485
Singapore	Singapore	Southeast Asia	18.44	6	Visakhapatnam	India	South Asia	5	486
Beijing	China	East Asia	18.11	7	Duque de Caxias	Brazil	Latin America	5	487
Shanghai	China	East Asia	17.98	8	Pyongyang	North Korea	East Asia	5	488
Moscow	Russia	East Europe	17.97	9	Rajkot	India	South Asia	5	489
Sydney	Australia	Oceania	17.96	10	Yerushalayim	Israel	West Asia	5	490
Milan	Italy	Southern Europe	17.55	11	Kemerovo	Russia	East Europe	5	491
Madrid	Spain	Southern Europe	17.37	12	Petrozavodsk	Russia	East Europe	5	492
Frankfurt	Germany	Central Europe	17.35	13	Bryansk	Russia	East Europe	5	493
Brussels	Belgium	Western Europe	17.34	14	Voronez	Russia	East Europe	5	494
Los Angeles	US	North America	17.18	15	Lipeck	Russia	East Europe	5	495
Toronto	Canada	North America	16.90	16	Machackala	Russia	East Europe	5	496
Taipei	China	East Asia	16.74	17	Groznyj	Russia	East Europe	5	497
Seoul	South Korea	East Asia	16.74	18	Astra Chan	Russia	East Europe	5	498
Washington	US	North America	16.64	19	T'umen	Russia	East Europe	5	499
Warsaw	Poland	East Europe	16.44	20	Djibouti	Djibouti	East Africa	5	500

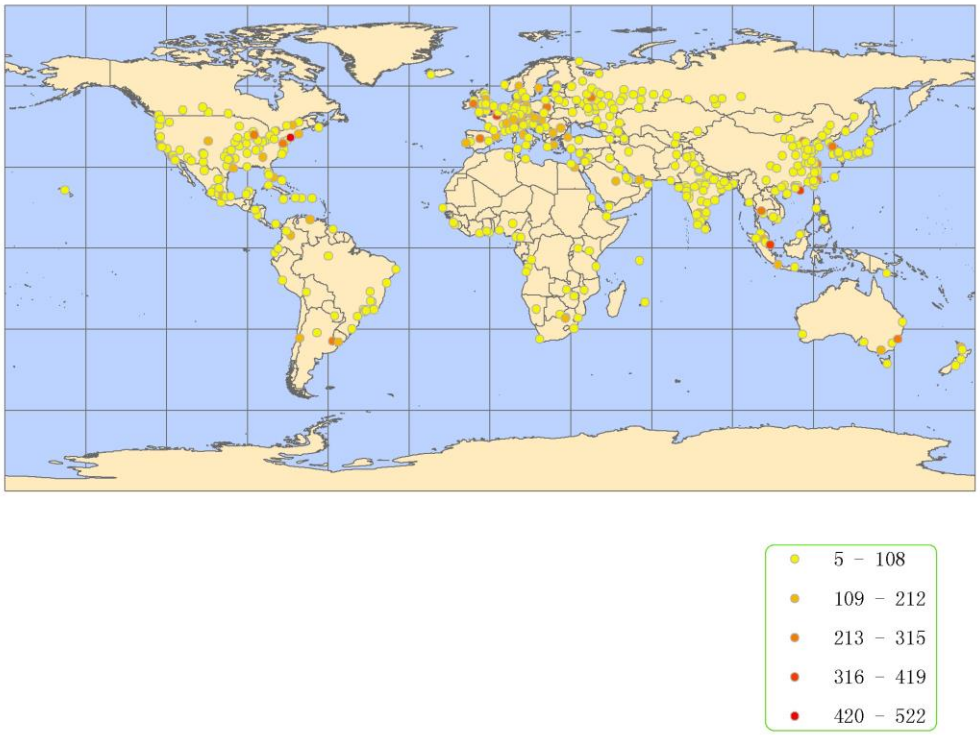


Figure 11.1 The distribution of multinational companies in the world (Unit: index)

11.2 A shifting trend of the world economic centers is emerging

World economic centers have been located in Europe, the United States and Japan exclusively. Yet in addition to Tokyo, Beijing, Shanghai, Taipei and Seoul have entered the top 20 cities in terms of the presence of multinational companies. It indicates that many Asian cities outside Japan are rising in terms of economic control power and might become new world economic centers.

In general, the US and European cities still dominate the list. Some Latin American and African cities, for example, Johannesburg and Cairo have fairly high ranks. Many central cities in Asia, including Hong Kong, Beijing, Shanghai and Taipei in China, Singapore, Bangkok, Kuala Lumpur and Jakarta in Southeast Asia, Seoul in South Korea and Bombay in India are among the top 50.

Among the top 150 cities, 49 are in Europe, accounting for 34.3% of the sample cities of the region; 34 are in Asia, accounting for 18.8%; 33 are in North America, accounting for 47.1%; 19 are in Latin America, accounting for 32.8%; 8 are in Africa, accounting for 22.2%; and 7 are in Oceania, accounting for 58.3%. Figure 11.2 shows the distribution of the top 150 cities by continent.

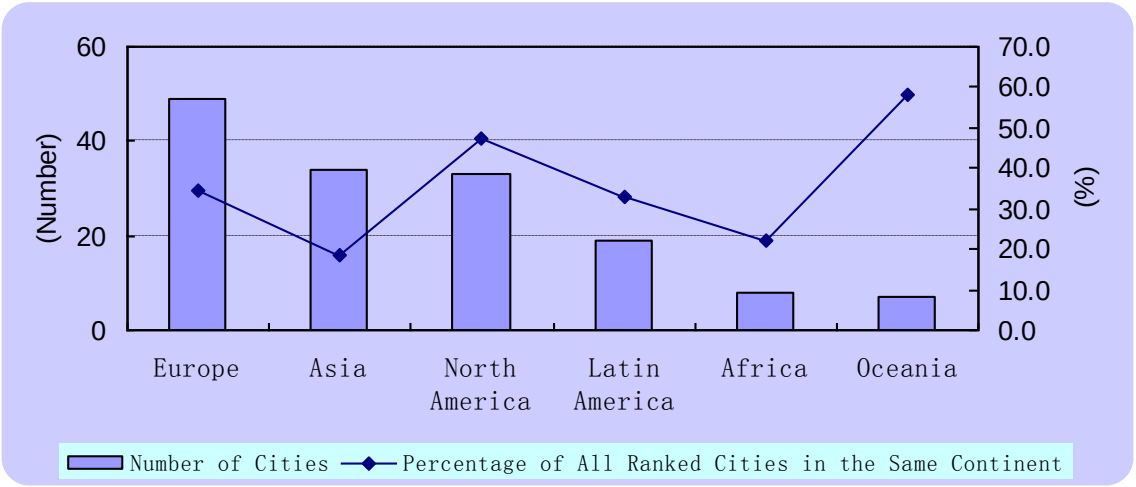


Figure 11.2 The distribution of the top 150 cities in terms of the presence of multinational companies by continent

Among the bottom 150 cities, 80 are in Asia, accounting for 44.2% of the sample cities of the region; 44 are in Europe, accounting for 30.8%; 17 are in Latin America, accounting for 29.3%; 8 are in Africa, accounting for 22.2%; 1 is in Oceania, accounting for 8.3%; none is in North America.

A comparison of the top 10 cities in 3 major continents in terms of the presence of multinational companies (see the following table) indicates that Europe, North America and Asia are roughly at the same level.

Table 11. 2 Top 10 cities in North America, Asia and Europe in terms of the number of multinational companies

	North America			Asia			Europe		
Regional Rank	City	Country	Global Rank	City	Country	Global Rank	City	Country	City
1	New York	US	1	Hong Kong	China	3	London	United Kingdom	2
2	Los Angeles	US	15	Tokyo	Japan	5	Paris	France	4
3	Toronto	Canada	16	Singapore	Singapore	6	Moscow	Russia	9
4	Washington	US	19	Beijing	China	7	Milan	Italy	11
5	Chicago	US	26	Shanghai	China	8	Madrid	Spain	12
6	San Francisco	US	38	Taipei	China	17	Frankfurt	Germany	13
7	Atlanta	US	41	Seoul	South Korea	18	Brussels	Belgium	14
8	Miami	US	52	Bangkok	Thailand	21	Warsaw	Poland	19
9	Dallas	US	53	Mumbai	India	24	Dublin	Ireland	23
10	Boston	US	57	Kuala Lumpur	Malaysia	28	Amsterdam	Netherland	27

12. Price advantage: cities in developing countries have distinct advantages

Price and cost are important aspects of a city's competitiveness and the ratio of nominal exchange rate to PPP exchange rate shows price and cost advantages. The ratio of nominal exchange rate to PPP exchange rate could reflect the actual price level of a country. If the ratio is smaller than 1, it indicates that the actual price level is higher than the nominal price level; if it is larger than 1, the actual price level is lower than the nominal price level. However, the ratio of nominal exchange rate to PPP exchange rate is not calculated on the basis of cities, but on the basis of countries. That is, in each country, there's only one ratio of nominal exchange rate to PPP exchange rate. With regard to the 500 sample cities, the ratios of Northern Europe, central Europe, Western Europe, Japan, Kuwait and the United States are smaller than 1, indicating that actual price levels in these countries are higher than nominal price levels, which poses as a disadvantage. The ratio of Australia is 1, indicating that its actual price level is the same of its nominal price level. For the remaining countries, their actual price levels are lower than their nominal price levels, creating considerable price advantages. Notably, Switzerland, Kuwait, Iceland, Norway and Sweden have the most disadvantages and Myanmar, Zimbabwe, Ethiopia, Cambodia and Zaire have the most advantages in actual price level. Among the four BRIC countries, China and India have more advantages than Russia and Brazil.

13. Cities: Everything is possible in the future.

One of the most important contributions of the study is the establishment of a database of 9 objective indicators of the 500 sample cities, an action never before tried in the world. This data enabled us to conduct analysis and comparison through a number of different approaches, and to draw valuable findings. We tried to conduct overall analysis of the 9 indicators of the 500 sample cities through dynamic clustering methods and processes, which will be explained in detail in Part 7.

Based on the dynamic clustering theory, we used the SPSS model to conduct clustering analysis for the 9 explicit indicators of the 500 sample cities, and divided the samples into 10 classes (see Table 3.2).

Table 13.1 Number of cases in each cluster

										Valid	Missing
1	2	3	4	5	6	7	8	9	10		
2	22	3	100	64	102	2	29	151	25	500	0

Based on the above theory, we revised the results repeatedly with SPSS, and obtained 10 final cluster centers for each of the 9 explicit indicators.

Table 13.2 Final cluster centers

Indicator	**Cluster**									
	1	2	3	4	5	6	7	8	9	10
Nominal /Real Exchange Rate Ratio	.023	.028	.032	.028	.028	.305	.020	.230	.208	.145
GDP	.811	.094	.020	.033	.070	.019	.949	.008	.010	.097

GDP per Capita	.950	.505	.663	.553	.741	.071	.799	.034	.066	.186
GDP per Square Kilometer	.716	.288	.871	.100	.196	.032	.358	.015	.029	.105
Real Economic Growth Rate	.190	.163	.278	.204	.186	.565	.136	.279	.301	.323
Employment Rate	.907	.903	.939	.913	.903	.927	.907	.503	.897	.902
Labor Productivity	.940	.376	.375	.436	.597	.063	.554	.047	.061	.169
Number of International Patents	.637	.379	.017	.087	.281	.018	.848	.007	.012	.106
Multinational Corporation Score	.980	.133	.117	.076	.209	.045	.642	.054	.046	.400

Then the cities were classified in accordance with the absolute difference between the values of the 9 indicators and those of the 10 clusters by the 9 indicators. The narrower the gap is, the more valid the classification. The following table is the classification of the 500 sample cities by the 10 clusters:

Table 13.3 Classification of the 500 sample cities by K-average method

City	Cluster	City	Cluster	City	Cluster	City	Cluster
London	1	Dublin	5	Paris	7	Rio de Janeiro	9
New York	1	……	5	Tokyo	7	Brasilia	9
Manchester	2	Vienna	5	Sarajevo	8	San Salvador	9
……	2	Oslo	5	Belgrade	8	Lima	9
Berlin	2	Stockholm	5	Groznyj	8	Quito	9
Lyon	2	Helsinki	5	Baghdad	8	Cairo	9
Madrid	2	Copenhagen	5	Sanaa	8	Bucharest	10
Kyoto	2	Milan	5	Kabul	8	Warsaw	10
San Juan	2	Los Angeles	5	Port-au-Prince	8	Prague	10
Geneva	3	Chicago	5	Tripoli	8	Budapest	10
Macao	3	Boston	5	Addis Ababa	8	Moscow	10
Victoria(CA)	3	Philadelphia	5	Nairobi	8	Beijing	10
Liverpool	4	Minsk	6	Djibouti	8	Shanghai	10
Lille	4	Saint Petersburg	6	Kampala	8	Hong Kong	10
Toulouse	4	T'umen	6	Porto Alegre	9	……	10
……	4	Suzhou	6	Sofia	9	Singapore	10
Marseille	4	Hangzhou	6	Kaohsiung city	9	Bangkok	10
Turin	4	Ho Chi Minh City	6	Busan	9	Kuala Lumpur	10
Sapporo	4	Hanoi	6	Kiev	9	Mumbai	10
Sendai	4	Phnom Penh	6	Penang	9	Istanbul	10
Pittsburgh	4	Delhi	6	……	9	Mexico City	10
Memphis	4	Calcutta	6	Malacca	9	Sao Paulo	10
Tampa	4	Bangalore	6	Manila	9	Buenos Aires	10
Tulsa	4	Monterrey	6	Cebu	9	Santiago	10

Cities of cluster 1 usually have world-leading economy size, GDP per capita, productivity, GDP per square kilometer, international patent applications, and number of transnational companies, as well as a relatively high employment rate and economic growth. Cities of cluster 1 are New York and London. As global economic centers, they are getting stronger and stronger, and leading other cities by increasingly clear advantages.

Cluster 2 cities have relatively high GDP per capita, productivity and GDP per square kilometer. However, they are restricted by relatively small economic size and weak decision making ability. Particularly, they have very low or even negative economic growth. There are 22 such cities in total, including Manchester, Lyon, Berlin, Kyoto and Kobe. Most of these cities are regional centers with a splendid history, but signs of economic decline.

Cluster 3 cities usually have strong economic growth, in spite of limited edge in per capita income, productivity, economic clustering, economy size, and ability of innovation. In total, there are 3 such cities. In fact, the cluster should include Las Vegas and a number of others. They are special cities that depend on special service industries. Currently, they have strong momentum of development.

Cluster 4 cities usually have low per capita income, productivity and economic clustering, weak innovation ability and economic control, low economic growth and little price advantage. In total, there are 100 such cities, distributed mainly in developed countries or the outskirts of global economic centers. As less developed cities in developed countries, they tend to have weak competitiveness and slow economic development.

Cluster 5 cities have relatively high GDP per capita, productivity and GDP per square kilometer. However, compared with London and New York, they have lower indicators in terms of GDP size, patent application, and number of transnational companies. In spite of high employment rate and economic growth, they do not have a clear competitive edge in terms of prices. In total, there are 64 such cities, mostly international cities in developed regions. In general, such cities can be divided into two classes. The first class includes cities that have been and are still among the developed cities, including Chicago, Boston, Philadelphia, Frankfurt, Munich, Milan, Amsterdam and Rotterdam, which have strong competitiveness and momentum of development. The second class includes many cities that were once less developed, e.g. those in the Scandinavian region and the west coast of the Untied States such as Dublin, Oslo, Stockholm, Helsinki, Copenhagen, Los Angles, Seattle, Phoenix, San Francisco, San Jose, San Diego and Melbourne. Once in the outer rims of global economic centers, these cities are on their way to becoming regional centers. With strong competitiveness and momentum, they are quickly surpassing their rivals.

Cluster 6 cities tend to have low GDP, GDP per capita, productivity, GDP per square kilometer, international patent applications, and number of transnational companies. However, they have a competitive edge in prices and dynamic economic growth. In total, there are 102 such cities, including many regional centers (instead of national economic and political centers) in China, Russia, Mexico, India and other emerging countries and countries undergoing transformation. Most of these cities, e.g. Minsk, Omck, Tianjin, Suzhou, Baku and Manaus are located at advantageous regions outside global economic centers and on the rise.

Cluster 7 cities are Tokyo and Paris, both with world-leading economic size, development level, productivity, technological innovation and decision making ability. However, they have maintained low economic growth. During the 2001-2005 timeframe, the

economic growth of Paris was 1% and that of Tokyo was as low as 0.1%, showing signs of decline.

Cluster 8 cities have prominent price advantages. However, they tend to be the weakest by other indicators, particularly per capita income and patent applications, negative economic growth and low employment rate. In total, there are 29 such cities, which are mostly located in Africa, and the Caribbean region, as well as the warring countries and regions in East Europe and Asia, including Sarajevo, Belgrade, Groznyj, Baghdad, Kabul, Port Au Prince, Tripoli, Addis Ababa, Nairobi, Djibouti and Kampala. Most of these cities are located in the outer rims of the world economy. As they continue to decline, they are expanding the gap with other cities.

Cluster 9 cities has distinct price advantages, but are weak in terms of other indicators. However, they have much better overall performance than cluster 8, the worst performing cities. In total, there are 150 such cities, mostly central cities with weak competitiveness in smaller economies in Asia, Europe and Latin America, e.g. Balimore, Kaohsiung, Pusan, Rio de Janeiro and Cape Town.

Cluster 10 cities have prominent price advantages, but relatively low per capita income, productivity and GDP per square kilometer. They have leading economic size, patent application and number of transnational companies and high economic growth and employment rate. In total, there are 29 such cities, mostly political and economic centers in emerging countries undergoing transformation and industrialization in East Europe, Southern Europe, Asia and South Africa, e.g. Prague, Moscow, Beijing, Singapore, Dubai, Sao Paulo, Buenos Aires and Alaska. Most of them are located at the centers of outer rims of the world economy and are rising fast.

The above clustering shows that, in global economic centers, top ranking cities are getting increasingly stronger and expanding the gap with other cities. Some other cities are relatively weak, with slowing-down, or even declining economies. Many cities in the relatively outer rims of the world economy are rising fast and surpassing rivals. In the outer rims of the world economy, cities have extremely low competitiveness and continue to decline. Some central cities or those with distinct advantage in geographic location are rising fast. It proves that the economic globalization and fast evolving technologies have brought both the opportunity of a fast rise and the threat of decline to cities around the world, big or small, developed or undeveloped, currently on the rise or on the fall. Given the context of global competition, the relations between cities across the world are getting increasingly uncertain. For each city, anything is possible. On the other hand, every city should take positive actions in accordance with rules to avoid failure and achieve success.

14. What have city governments around the world been doing?

In face of the opportunities and challenges of globalization, informatization, urbanization, and the increasingly fierce competition in the world market, central and local governments have been taking actions since the beginning of the new century to consolidate their positions, move upward along the value chain, lead the trends, catch up with and surpass world leaders, and improve their global competitiveness.

14.1 Adopting development strategies, plans and guidelines

City governments around the world are adopting development plans to guide the fast

development of their cities. Dubai has identified the target of being the No.1 in the world. London has adopted a series of strategic development plans, including *London Innovation Strategy and Action Plan 2003-2006* and London: *Cultural Capital, the Mayor's Culture Strategy* to implement a strategic development of cooperation with other major cities in the world. Vienna is adopting a strategy with international identities to facilitate industrial development with music and to develop the hi-tech industry. Many other cities, including Sydney and Melbourne have developed their 2030 visions.

14.2 Improving business environment and supporting the development of SMEs

Employment is the foundation of the welfare of the people. Many city governments are taking positive actions to improve their business environment and establish their service systems to support the development of small and medium enterprises (SMEs). They have realized that SMEs are key to a robust local economy. In spite of their sizes, the achievements of SMEs prove to be the foundation of their cities. In Osaka, there are SME-oriented financial institutions, the Japan Finance Corporation for Small and Medium Enterprise, National Life Finance Corporation, Credit and Insurance Corporation for Small and Medium Enterprise and Corporation for the Support of Small and Medium Enterprise established to provide services to SMEs and to develop SME entrepreneurs. Similarly, Singapore, the United States, Canada, EU, and almost every other country in the world have adopted policies to support SMEs as one of the top priorities.

14.3 Promoting the upgrading of industries and achieving the transformation of the cities

The adjustment and upgrade of industrial structures will ultimately decide to what extent the functions of a city can be improved, and what position it will take along the value chain. Promoting industrial upgrade is the permanent theme of development for cities. Birmingham, which was a star city during the industrial revolution, has taken a series of actions in line with the latest changes in the market to integrate its traditional culture with the service. Today, it is admired for its tourism and cultural industries and its successful transformation. From a small port city on the south coast of the Arabian Peninsula, Dubai has grown into an appealing international tourism city, as well as an international financial center. The secret of its success lies in its unyielding transformation and industrial upgrade. From canal operation in the 1970s to international trade in the 1980s to tourism in the 1990s to high-end service sector in the 2000s, every step is a link in Dubai's history of industrial transformation, which proves to be a successful model for other cities.

14.4 Implementing national life-time education program and attracting talents from around the world

It is generally accepted that human resources is the most important contributor to competitiveness. Cities are taking various actions to attract talents from around the world and develop human resources internally. New York has announced to increase input in education and human resources development, and to implement intelligent children education. While highlighting the importance of education, it is assigning an increasingly significant role on the education sector. Regarding people as a resource, Paris has introduced effective measures to integrate diploma education with certificate examination and special training to create a sound room of development for its citizens and fair market opportunities. In addition, it has adopted strict rules for on-job training, expenses and mechanisms concerned. For example, it orders that each enterprise shall pay an employee training fee not less than 1% of the total payrolls to support on-job training. Tokyo is known for its powerful research institutions. Yet it is also trying to attract talents by creating a sound research and living environment. In 2004, the

largest economic body in the city—Japan Federation of Economic Organizations proposed to extend the visa of each foreign student for 2-3 years, even if he/she cannot find a job. Helsinki has adopted a number of economic policies to encourage innovation. The first one is for the attraction and retaining of talents. It aims at improving the internationalization level and influence of local universities to build Helsinki into an international education and research base by improving the service to foreign students and researchers. Singapore offers a series of preferential treatments to foreign laborers and technicians concerning salary, residence, spouse arrangement and taxation. The government has specifically established a Professional Profile and Employment Intermediary Service Committee and a Foreign Talent Absorption Committee to attract human resources in larger scope and at higher level.

14.5 Focusing on environmental protection and pursuing sustainable development

Known as a "garden city" across the world, Singapore is highly concerned with environmental protection and has introduced intensive publicity programs for the purpose. With huge amount of investment in environmental infrastructure development and energy utilization, and strict law enforcement, Singapore is able to maintain the image of world-famous garden city. In Sustainable Sydney 2030, Sydney announced the goal of becoming a "world leading city with a beautiful environment" and its plan to build a green urban transport network. In the meantime, it is going to develop infrastructures for sustainable energy and water resource utilization and wastewater treatment in an effort to satisfy the resource demand and further improve the efficiency of resource utilization.

14.6 Shaping brand images and staging marketing programs for their cities

Cities around the world have realized that improving their brand images and promoting themselves to the world would be helpful to bring local industries into the world market. As an old Chinese saying goes, "a brewery located in a long valley needs to promote itself no matter how good its wine is". In this respect, the marketing efforts of Seoul have been really remarkable. In 1988, Seoul hosted the 24th Olympic Games and the 10th Asian Games, which turned out to be the start of the city's massive marketing campaign. At the end of 2003, the city government adopted *Strategic Marketing Plan to Build Seoul into A First-Class City in the 21st Century* proposed by South Korean Advertising Society. In the same year, it appointed 13 celebrities as the image ambassadors of the city. A series of intensive marketing festivals, exhibitions, cultural/sports events and online marketing campaigns eventually delivered satisfactory results. Sydney, on the other hand, leveraged its global Olympic tourism strategy to build world-class tourist resorts and gulf. In addition, many other cities are introducing their own marketing campaigns, e.g., "Special Singapore", "Flying Dragon Hong Kong", "Infinite Toronto", "Smiling Glasgow" and "New York, with Love".

14.7 Building service-oriented governments with business-level management

Worldwide, major international cities are introducing positive actions to enhance their management level. Phoenix, an important city in the west of United States has announced to adopt a business-level management and operation, whereby the city council is regarded as a corporation, and citizens its shareholders and customers. By paying taxes, Phoenix citizens are buying the stocks and services of that corporation. The innovative idea has improved the service awareness of the public and the sense of responsibility of the government with satisfactory result. The business-level government management idea is a good example to learn from.

14.8 Building the city of innovation and the city of knowledge

Cities around the world, particularly, those in developed countries are taking actions to enhance their positions in the field of science and technology, and leverage knowledge to promote their development. Through industrial agglomeration, Stockholm is pushing for the industrialization of the hi-tech sector and the commercialization of the wisdom capital, and encouraging innovation and venture. Shenzhen, on the other hand, has been strengthening its IPR protection, helping businesses to solve the financing problem for their R&D activities, and building a "virtual university town" and a "Shenzhen International Hi-tech Business Platform". Helsinki has identified the hi-tech manufacturing as its pillar industry. It is taking opportunities in the IT market to guide the development of the semiconductor and biotech sectors. Vienna is building its science and technology center. Melbourne has announced to develop a knowledge-based city. Many other cities, including Boston, Sydney, Ruhr, Helsinki, Glasgow, Birmingham, Huddersfield and Montpellier are committed to the development of cities of innovation or knowledge-based cities.

14.9 Developing information networks to build the wireless city

Information network is the focal point of the infrastructure development contest among international cities, as well as a requirement of the global Internet economy. New York, for example, has announced an online city development plan to lead the information revolution. Taipei and Pusan are doubtlessly shining stars in this contest. With the vision for a "convergent city", Pusan is engaged in the development of a modern, convergent and digital, intelligent city based on Samsung's Ubigate series convergent network products. In the meantime, it is integrating its port, transport, conference, medical and a number of other service systems, with the aim of becoming the first city in the world to introduce a comprehensive "convergence architecture". Taipei initiated a networked city development plan in 1999. Based on Guidelines for Phased Development of a New Networked City, it developed Taipei Wireless Broadband Network Development Program to promote the application of wireless network and the relevant services, and to achieve the goal of "wireless Taipei, infinite Taipei".

14.10 Shaping the identities of the cities by fostering diversified cultures

The higher-level competition among cities is the competition of cultures. As the leaders in the world, the world cities are facing particularly fierce competition in terms of cultural strategy and innovation. Cities around the world are working hard to protect their heritages, promote their own cultures, shape their own identities, attract migrants, advocate convergence and foster a diversified culture. In the field of cultural diversification, Toronto has made really remarkable achievements, as it is called "the melting pot of world cultures". New York and London are engaged in the development of a diversified culture, too. Melbourne is trying to develop its cultural industry to attract migrants and foreign students from around the world. It proves to be an effective means to drive the development of the city's higher education sector, to increase the reserves of its knowledge resources, and to promote its headquarters economy. Vienna has impressed the world with its art and culture. It has received both satisfactory economic benefits and admirable international reputation for its awe-inspiring music art. Based on the traditional oriental culture, the Chinese city of Yangzhou is following a path of sustainable development, and is regarded as a paradigm of success in developing countries.

14.11 Attracting multinational companies' headquarters for decision making and enhancing global connectivity

As key sectors and critical functions of the world economy, finance, R&D, transportation, culture and management directly affect the position of a city in the global industrial chain, which, in turn, affects the distribution of multinational companies. Therefore, cities around the

world are taking actions to build international financial, transportation, innovation, cultural and management centers to attract multinational companies and enhance global connectivity. Hong Kong has positioned itself as an Asian metropolis to attract more world-leading multinational companies to move their regional headquarters there and to consolidate its position as an international financial and business service center. Melbourne is trying to improve its business environment to attract more corporate headquarters. The growth of Helsinki is the result of opening up to the world, the lifting of restrictions on foreign capital, the implementation of joint research plans with EU and partnerships with Northern European countries. Dublin, on the other hand, is today the base of the European headquarters of many North American companies. Many Asian cities, including Dubai, Seoul, Shanghai and Bombay have announced plans to build international financial centers. In Europe, Frankfurt and a number of other cities have announced ambitious plans for the development of financial centers.

In general, cities around the world are taking actions to enhance their strategies, enterprises, industries, human resource reserves, hard/soft environments and global connectivity to consolidate their positions in the global competition and to move upward along the value chain. In a word, the cities are busy, which indicates that the competitions among them are getting more and more intensified.

15. How should city governments handle challenging relations in the future?

As of 2008, 50% of the world population live in cities. Today is in a real urban era, as the world is at its peak of urbanization. On the one hand, urbanization has promoted economic growth and the potential for world development. On the other hand, it has created severe challenges in the poverty population, housing, and environmental protection. Therefore, governments need to re-examine the sustainable economic, social, environmental, and cultural development of their cities, and make foresighted plans for the education, employment and housing of the large number of migrants, and build pleasant homes for the people.

In the meantime, technology, information and economic globalization are changing the concept and decision making processes of economic, technological and social activities worldwide. While enhancing the role of cities in global affairs, they have further intensified the competition among them. For every city, anything is possible in the fierce global competition. They need to take action to maintain their central and leading positions, to avoid being marginalized or declining. They need to catch up and surpass others by taking opportunities and addressing challenges, leveraging advantages and avoiding disadvantages, and developing and implementing scientific growth strategies and correct competition policies. Only by following the rules and taking positive actions can the city achieve success and avoid failure.

In this view, central and local governments, as well as relevant government agencies should properly handle the following general issues in addition to specific problems.

15.1 Central governments v.s. local governments: decentralization

The division of public power, particularly the power of taxation between central and local governments has a significant impact on the development of countries and sub-regions. In the time of globalization, cities are important platforms, as well as carriers of global competition. In local strategic development, the building of infrastructures, the provision of

diversified public products and services (including the provision of compulsory education, the establishment of universities, helping SMEs implement financing programs, providing new enterprises with information needed, and helping companies and research centers establish effective technological connections), handling local affairs and addressing external competition, cities have information and cost advantages.

Therefore, city governments should assume more responsibilities and play more important roles. Central governments should grant more decision making power to city governments to enable active and flexible handling of issues encountered in the competition and development of cities. In the meantime, governments should review their fiscal and taxation systems, and build sound fiscal and taxation systems allowing proper division of power to enable city governments to better fulfill their duties and support the development of local enterprises and the improvement of public welfare.

15.2 Government v.s. market: mutual infiltration

The relation between government and market is a permanent topic worldwide. However, in order to win in the fierce competition, city governments must re-think and adjust their relations with market. In addition, the governments, which bear more responsibilities for social and economic development, shall take actions not only to improve their public service, but also to facilitate restructuring. On the one hand, city governments should take an active part in market competition, create a sound business environment, build a strong brand and increase their appeal to more valuable enterprises. On the other hand, with innovative systems, and extensively applicable technologies, enterprises and non-government organizations are now able to provide more public services and quasi-public services and to improve the efficiency and quality of their service. It is necessary to encourage more enterprises, non-government organizations and private businesses to participate in city management and to build an extensive city governance mechanism.

15.3 Globalization v.s. localization: take it both ways

The city is a complicated open system. In an integrated world market, every city must carefully handle the relation between globalization and localization.

They must have a global mindset and take actions in line with the specific situation in the local market. Cities should grasp the trend in the world market, adopt world-leading standards, comply with the rules of global economic development, draw from the experience of leading cities, develop objectives in line with specific time and local market conditions, and select the right paths and strategies.

Cities should facilitate the development of world market-oriented industries, while protecting local industries. The former consists of enterprises with worldwide business presence and leading edges in price and competitiveness, while the latter mainly includes local manufacturing and service enterprises, which are established to ensure the employment and welfare of local people. While ensuring the complete privatization of world market-oriented industries, the approach enables the adoption of proactive social policies toward local economy.

To be able to utilize the two types of resources and both markets, cities need to absorb and utilize production factors, talents and resources from around the world, increase global market share and leverage their comparative advantages, which they should try to convert into their competitive advantages in line with their geographic location, industrial features and the availability of capital and human resources.

15.4 Industrial upgrading and employment: national life-long education

Industrial upgrading is a permanent theme of development, as well as the momentum of sustainable development for a city. However, industrial upgrading, or the development of high-end industries would result in higher demand for talents, and the conflict of the human resource supply-demand structure. In other words, while a large number of high-end professionals are needed, many low-end workers would loose their jobs. This has been a challenge for many international cities.

The key to solving this challenge is to promote life-long education for every citizen. By building and improving a sound education system, cities would be able to improve the quality and skill structure of their populations, and eventually solve the conflict between employment and industrial upgrading.

15.5 Introduction of talents v.s. local population: nationwide drive for business startup

The introduction of high-end external talents is a basic strategy to improve competitiveness and achieve sustainable development. Cities across the world are taking actions to attract high-end foreign talents to sustain their own development. These personnel, however, could increase the employment pressure of local citizens. The increasingly sharp conflict between the talents introduced and the local population has been a challenge for many cities across the world.

In order to facilitate development and achieve win-win of the local population and talents introduced, cities need to create a sound business startup environment, guide their citizens to start their own businesses, and to expand the employment market. Through this means, they would be able to achieve growth, allow the sharing of prosperity and fundamentally solve the employment conflict between local population and talents introduced.

15.6 Economic development v.s. social security: a proper balance needed

It is necessary to ensure the complementation and mutual support of social security and economic development. Social security is the stabilizer of economic development and the foundation of market competition. Economic development is the pillar of social security. The economic strength is critical to the success of the social security system. In view of the fierce competition in the global market, city governments need to provide their citizens with good education, job opportunities and housing, as well as necessary life facilities and public services. In the meantime, they should also try to create a sound business environment, support competitive industries and assume responsibilities for economic development.

In this regard, cities in the East and West countries have much to learn from each other. Cities in the developed countries in the West have solid and extensive social security system, but are less motivated and passionate about economic development. Cities in the East, particularly those in East Asia have strong momentum for economic development, but need to do more for their social security.

15.7 Specialization v.s. diversification: refocusing strategy

Specialization and diversification are two different strategies for the development of cities. Both have their respective advantages and disadvantages. Specialization could improve efficiency but may result in too few industries in a city. If these industries are not transformed in time, the city would be easily caught in a decline. Diversification is helpful for avoiding market risks, but would create too many industries, which would consume resources and affect the economies of scale.

To leverage the advantages and avoid the disadvantages, it is necessary for cities to adopt the strategy of refocusing for function positioning and industrial structure development. That means that they should select neither just one industry, nor numerous industries. Instead, they should select a number of interrelated industries as their pillar industries. This approach could ensure the economic benefits of the specialization model and the stability of the diversification model, and avoid the disadvantages of both.

15.8 Business environment v.s. living environment: both are important

Business environment and living environment are both consistent and conflicting. On the one hand, job opportunities are important conditions to support the life of the citizens, while a good living environment could attract high-end talents and is helpful for the development of high-end industries. On the other hand, however, industrial development is often achieved at the cost of life and environmental quality. Overemphasis on the living environment would affect the development of local industries.

Properly handle the relations between them could facilitate the prosperity of both to the extent possible. Ensuring a good living environment should be regarded as the ultimate objective of industrial development. In the meantime, maximum efforts should be made in the industrial development to ensure the protection of the living environment. The principle of mutual support between the living environment and the business environment should be adopted to build a new mechanism for the sustainable and harmonious development of ecological, cultural and social elements in both the living environment and the business environment.

15.9 Cities and rural areas: co-development should be achieved

In countries and regions of low urbanization level, the relation between cities and rural areas is a challenging issue. In highly urbanized countries and regions, the relation between central and peripheral regions is also very complicated. Actions should be taken to properly handle the relations between rural areas and cities to ensure their co-development.

Co-development does not mean that cities and rural areas must have identical objectives, tasks and measures. On the contrary, different but mutual supporting tasks and measures should be identified for cities and rural areas in accordance with their specific situations. The market mechanism should be used to ensure a win-win result. In addition, it is necessary to ensure the integration of the soft environment, including mechanisms, management and service, and the hard environment and infrastructures of both cities and rural areas to provide equal opportunities and to allow the sharing of the benefits from external economic development. In view of the relatively weak strength of the rural areas, the government should make up the defect of the market by increasing transfer payment to the rural areas to support their development.

15.10 Competition v.s. cooperation: both are essential for development

Due to the independence of economic benefits, the scarcity of resources and restriction of the market, competition among cities is inevitable. On the other hand, cities' difference in natural resources, initial conditions, development paths and the foundations for labor division have paved way for their cooperation. Therefore, competition and cooperation between cities are natural phenomena. However, the competition between cities could be of zero sum, negative sum, or positive sum, i.e., win-win models.

A wise city government should employ both competition and cooperation strategies. It shall not sacrifice competition for cooperation, or vice versa. Right competition and cooperation strategies would enable the sharing of the benefits and the taking of opportunities

to avoid zero sum or negative sum games and to achieve win-win or success for both.

15.11 History v.s. future: both should be taken care of

It has been a challenge for economists to properly handle the conflict between history and the present, and that between the present and the future. History could be both a fortune and a burden for a city. For the protection of historical heritages, many cities have lost the opportunity to win competition. On the other hand, to ensure a city to win in a future full of uncertainties, it is necessary to save resources and protect the environment at the present time, which could turn out to be restriction of the city. The historical heritages should be protected in ways that would turn them from burdens into fortunes. To win in the future, it is necessary to turn the environment from resources to capital. Therefore, while protecting unique and precious historical heritages and turning them into core assets of a city, it is necessary to introduce protective development measures. On the other hand, environmental protection and eco-city development means should be adopted to increase the appeal of a city to high-end factors and promote industrial upgrading. In the meantime, it is necessary to explore a win-win approach for the coordinated development of the economy, ecology, society and culture, and to facilitate sustained development of the economic, ecological and social systems.

15.12 Uniqueness v.s. diversity: openness and convergence

The most fundamental form of competition between cities is the competition of cultures. The national identities would most probably be accepted by the world. A competitive culture must be unique in the first place. Unique identity could differentiate a city from its rivals, and become an important cause for its survival and development. In this era of globalization, it is particularly important to maintain the identity and the unique culture of a city. A competitive culture must be an innovative culture at the same time. The convergence and collision of diversified cultures have created the conditions not only for the concentration of the best, but also for the introduction of innovations and creations.

To properly handle the relations between local culture and diversification, cities should persist on openness and convergence, which is not to keep all cultures identical, but to absorb and draw from external cultures to create a more competitive and more advanced one while maintaining the identities of their own.