

## Chapter 2

# Global Urban Competitiveness: Theoretical Framework

### 2.1 Introduction

As mankind enters an era of globalization and urbanization, the importance of cities has grown, with competition between cities becoming increasingly intense. The competitiveness of cities is clearly an important topic for theoretical propositions. Cheshire (1986) was the first to investigate and pay attention to the reasons and problems that led to the declining competitiveness of some European cities. Porter (1990) is the most renowned expert on competitiveness research. His study on the competitiveness of nations is also applicable to cities. Kresl and Singh (1995) later conducted an in-depth investigation to study the competitiveness of 24 metropolitan areas in the United States. Not long after that, some academics had a theoretical discussion on the topic of urban competitiveness, and Begg (1999) made his case for an antithetical system based on the issue of urban competitiveness. A growing number of academics have begun to study urban competitiveness since then (Pengfei 2010).

For the study on urban competitiveness, it is very important to measure the extent of urban competitiveness and to analyze the factors contributing to it. As urban competitiveness is a composite concept, no single indicator can be used in its measurement. A few academics have attempted to use single indicators like labor productivity (Porter 1990), GDP per capita or economic growth (Kitson 2005) as alternative measurements of urban competitiveness. Most academics used composite indicators to create an urban competitiveness index. Some academics and organizations tried to combine input and output factors of urban competitiveness to create an index for its measurement. Even more academics and organizations (Rondinelli and Vastag 1996; Kela-oluosi 2005; Tuerck 2002; Sharma 2006; Cho 2006; Diaz 2001; Shen 2002) put together the factors affecting urban competitiveness to build an index for measuring urban competitiveness. Even though the

factors affecting urban competitiveness are generally similar, the advantages are different for each city, or at the very least for different types of cities (e.g. differences in development stage, industrial structure, natural resource endowment and city size). Therefore, the factors affecting urban competitiveness are not the same, with different levels of influence. As such, it is obviously impossible to measure and reflect the urban competitiveness of all sample cities accurately using the same type of indicators and giving them the same weight in creating the urban competitiveness index.

The factors affecting urban competitiveness are complex and multi-dimensional. Academics combed through and analyzed different perspectives around factors that affect urban competitiveness respectively, such as controllable and uncontrollable factors, economic and strategic factors structural and dynamic factors (Sotarauta 2001), economic, social and environmental factors (Duffy 1995), internal and external factors, main city and environmental factors, and supply and demand factors (Porter 1990).

The evaluation of urban competitiveness is theoretical and it is a core issue that relevant sectors are interested in. This is because an evaluation of urban competitiveness allows a city to know its own competitive edges, disadvantages, problems and conditions in comparison to other cities. Investors and enterprises can understand situations that affect commercial factors in related cities and residents can have knowledge of their current welfare entitlements and future opportunities. The realistic importance of urban competitiveness evaluation attracted international organizations, national governments, companies and organizations, and academics of different nationalities to embark on the study of this topic and its actual measurement. Currently, a growing number of organizations are involved in such study and measurement. These organizations evaluate relevant cities from different perspectives, using different indicators and methods, providing governments, companies and residents with a lot of valuable information about cities (see Table 2.1).

There are some overall commonalities in the theoretical models and indicator systems of the above authors, which reflect the key areas involved in urban competitiveness: economic performance and standard of living, indicators related to urban environment attractiveness, such as human resources, technological innovation, external economies, economic structure, economic aggregation, etc. However, due to the fact that the authors are studying this from different angles and focus on different things, they come with varying degrees of flaws and biases.

## 2.2 Determining Mechanism

A city is an unofficial and open organization consisted of people, private sectors, quasi-public sectors and public sectors. In a city, enterprises organize their employees to create and provide private products and services for local and external

**Table 2.1** Urban competitiveness evaluation of world cities

Approach	Author/organization	Composites	No. of sample cities	No. of indicators
Output	Organization for Economic Co-operation and Development	1	78	1
	Peter Kresl (USA, 1999)	3	24	3
	Ni Pengfei (China, 2001)	6	200	12
	Cho Dong-Sung (South Korea, 2006)	3	75	5
	William Lever (England, 1999)	3		3
Input	Ni Pengfei (China, 2003)	12	60	199
	Douglas Webb (World Bank, 2000)	4		75
	Augusto (World Economic Forum, 2005)	3	55	40
	David Tuerck (USA, 2002)	8	50	37
	Abhishek Sharma (USA, 2006)	2	21	27
	Cho Dong-Sung (South Korea, 2006)	5	75	90
	Alvin Diaz (Philippines, 2001)	7	65	71
	Shen Jianfa (Hong Kong, China, 2002)	3	286	52
Input–output	Robert Huggins (England, 2003)	3	44	7
	Core Urban City Workgroup (England, 2004)	6	50	21

markets; public sector organizations create and provide localized public products and services. Together, they form a compound structure in the relatively independent space of the city.

### ***2.2.1 Determining the Competitiveness of a Single City***

In reality, the business choices of a company are determined based on the environmental conditions of the region it is located in, and these choices in turn determine the value-added created by the companies. As for a city, the element environment and external elements that can be effectively used determine the size, structure and efficiency of the city's industrial system (including industries and its different links); and the condition of the industrial system determines the ability of the city to create value. The combination of various influencing factors determines the choice of industrial system of an urban company cluster and the value-added it creates.

### ***2.2.2 Global Comparison of Urban Competitiveness***

In the context of global integration, there are so many urban areas around the world. Different cities are naturally different in their overall merits and elements. There are also differences in costs. It costs differently for a city to reach out to and make use of external elements. In an open economy, there is difference in the competitive advantages of various cities that arise from differences in key elements, resulting in the industrial differences and division of labor between different urban areas. The size, level, structure and efficiency of industrial systems in the corresponding cities thus vary widely, and the value-added they create is also very different. From a company's point of view, a global company may set up its global industry chain based on how key elements are distributed in different cities, and this will form the company's global value chain. From a city's point of view, a system formed on the basis of how key elements are distributed in different cities around the world determines the industrial network of global cities, and the distribution of this industrial network in different cities around the world determines the global value chain.

### ***2.2.3 Changes in Global Competitiveness and Patterns***

As population, companies and some important factors of production can move between cities, the differences in element endowments of cities lead to different potential benefits. Therefore, not only are there division of labor, cooperation and trade between cities, there is also complicated and diverse competition going on. Competition leads to the flow and redistribution of resources and elements across different cities, seeking maximal overall interests. Economic systems favor a state of general equilibrium, which includes the equilibrium of urban spaces. However, as elements, environments, as well as the overall merits of cities all keep changing, resources, factors, and industries tend to be redistributed in spatial terms, shifting the overall trend from one state of equilibrium to another.

Figure 2.1 is a simplified illustration: City A's open system of key elements is formed through attracting elements, industries and even wealth from City B and City C, as well as through making use of B and C's element environments and industrial cooperation with B and C, and this fosters an open industrial system that creates City A's value system and forms its urban competitiveness; City A's value system and industrial system also exert influence on its own element system amid global competition. The same is true for City B and City C.

The competitiveness of various cities is determined at the same time in the midst of cooperation and competition of their element environments, industrial systems and value gains and the situation changes constantly.

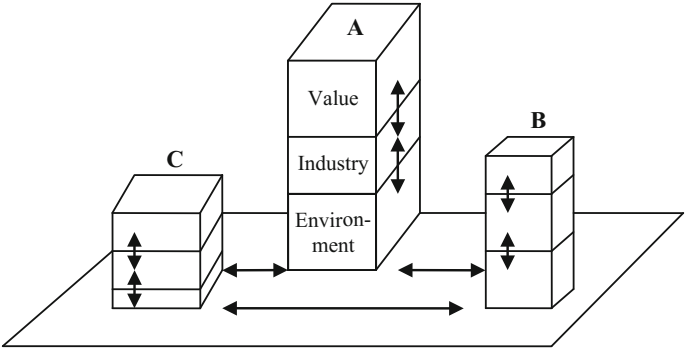


Fig. 2.1 Determination urban competitiveness

2.3 Conceptual Framework

According to mechanisms of urban competitiveness and development, a city’s global competitiveness (potential competitiveness) can be seen as its ability to attract, contest, own, control and transform resources, and to contest, seize and control the market, creating greater value faster, more efficiently and more sustainably, in comparison with other cities in the process of cooperation, competition and development.

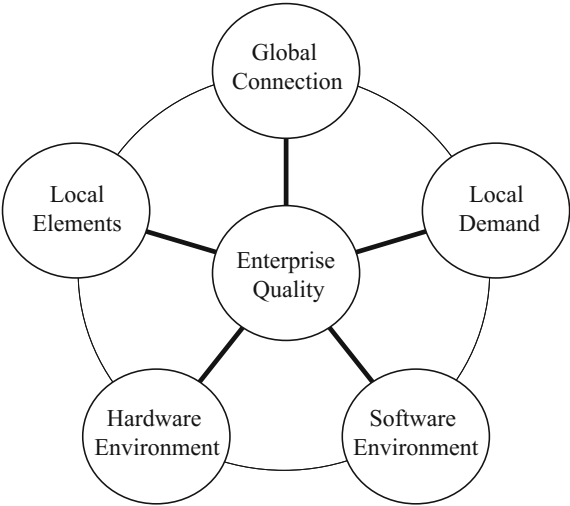
From the perspective of element environment, with reference to the national economic cycle model and the national competitive advantage model of Michael Porter, We hereby establish an urban competitiveness model encompassing six latent variables:

$$UC = f(EQ, LE, LD, LC, GC, SE, HE)$$

UC stands for urban competitiveness, EQ for enterprise quality (i.e. the merits of a city); LE for local elements (i.e. the city’s local supply of elements); LD for local demand (i.e. the city’s local market demand); LC for internal structure (reflecting links and clusters within the city); GC for global connection (the city’s communication with external bodies to utilize elements and market of these external bodies, and to face opportunities and threats from these external markets); SE for software environment (institutional arrangements and environment for exchanges); HE stands for hardware environment (the local infrastructure and ecological conditions). These six latent variables contribute in different ways to urban competitiveness but each and every one is indispensable.

This model centers on the overall merits (quality) of a city, its internal and external links, the systems for interactions and exchanges and its supply and demand to take into consideration a variety of factors: the city and its environment,

**Fig. 2.2** Global urban competitiveness: determining factors



supply and demand, existing stock and increment, short-term and long-term factors, static and dynamic factors, software and hardware, internal and external factors etc. (Fig. 2.2).

**2.4 Indicator System**

The six latent variables mentioned above point to six areas, all of which contain several specific factors of urban competitiveness. Taking hold of key factors and ensuring data availability, we selected a total of 22 indicators to construct the urban competitiveness indicator system (see Table 2.2).

**2.5 Research Methodology**

**2.5.1 Definition of a City**

A city usually means an area of residential neighborhoods with a high degree of urbanization. However, the specific definition and scope of a city are different from country to country. A city is defined in this report as a residential area under one administrative center that includes urbanized areas and may also include suburbs or villages. From this definition, it is obvious that we are looking at cities from the administrative perspective. It needs to be noted that due to issues with data availability during the process of the research, some individual cities have been classified as urbanized districts, while some other cities are classified as metropolitan

**Table 2.2** Global urban competitiveness indicator system

Category	Indicator	Data source and index composition
I1 Company strength	I1.1 Multinational company index	The data is taken from Forbes Global 2000, with additional points assigned to ranked companies in the city and multinational companies, 5 points for global headquarters, 4 points for continental headquarters, 3 points for country headquarters, 2 points for regional headquarters, and 1 point for city headquarters
	I1.2 Forbes 2000 total	Company total on the Forbes Global 2000 list (2011)
	I1.3 Industrial structure	According to relevant information and scores given by experts in the relevant disciplines
	I1.4 Industrial standard	According to relevant information and scores given by experts in the relevant disciplines
I2 Local elements	I2.1 No. of patents	The data is taken from the World Intellectual Property Organization (WIPO) website ( <a href="https://patentscope.wipo.int/search/en/search.jsf">https://patentscope.wipo.int/search/en/search.jsf</a> )
	I2.2 Unemployment	Relevant statistical data of countries and cities (2011)
	I2.3 Bank index	Number of financial enterprises in Forbes Global 2000 (2011)
	I2.4 University rankings	Ranking of world universities (Webometrics Ranking) (2011)
I3 Local demand	I3.1 Population	Relevant statistical data of countries and cities (2011)
	I3.2 GDP	Relevant statistical data of countries and cities (2011)
	I3.3 National per capita income	World Bank website data (2011)
I4 Software environment	I4.1 Crime rate	United Nations International Centre for the Prevention of Crime statistical data reported by the governments of the respective countries <a href="http://www.uncjin.org/Statistics/WCTS/wcts.html">http://www.uncjin.org/Statistics/WCTS/wcts.html</a>
	I4.2 Language diversity index	Measured by on the language diversity of hotels in each city with four stars and above (2011)
	I4.3 Ease of doing business	<i>Global Business Environment Report</i> published by World Bank (2011)
	I4.4 Ratio of central versus local taxation	Relevant statistical data of countries and cities (2011)

(continued)

**Table 2.2** (continued)

Category	Indicator	Data source and index composition
I5 Hardware environment	I5.1 PM 2.5 emissions	Information on the World Health Organization (WHO) website on the urban air quality figures (2011)
	I5.2 Benchmark hotel prices	The data is obtained from searching on the Holiday Inn site ( <a href="http://www.holidayinn.com/hotels">http://www.holidayinn.com/hotels</a> ) and calculating the average value of 4–5 medium priced prices. Newly added website: <a href="http://www.booking.com">http://www.booking.com</a>
	I5.3 Ease of road travel	The data is based on Holiday Inn using Google search (the nearest Holiday Inn to the city center is found and its nearest distance, time and cost of travelling to the airport, metro/railway stations and the city's administrative offices are calculated)
	I5.4 Distance from sea	The distance of the city from the nearest harbor is calculated according to the coordinates (latitude/longitude) data obtained from Google Maps (2011)
I6 Global connection	I6.1 Multinational company connection	The data is taken from Forbes Global 2000 calculations (2013)
	I6.2 International reputation index	The data is taken from searching, on Google, the English names of cities or English websites on the cities ( <a href="http://data.worldbank.org.cn/indicator/NY.GDP.MKTP.CD">http://data.worldbank.org.cn/indicator/NY.GDP.MKTP.CD</a> )
	I6.3 No. of air routes	The data is taken from the websites of the various airports in cities, Wikipedia and relevant data on the International Air Transport Association (IATA) website (2015)

areas. We have included special notes regarding this at the relevant sections accordingly. Those without special notations are all cities based on an administrative definition.

### 2.5.2 Sample Cities

Evaluation of global urban competitiveness then proceeded to the selection of the cities. The diversity and typicality of samples contribute to the accuracy and value of research results and 505 cities from around the world were selected as sample cities for the purpose of this report. The sampling process is detailed below:

Firstly, for a preliminary round of screening, a brief study was conducted on cities in various countries and regions across the six continents, with major cities as candidates.



Secondly, with the aim of including a total of 505 sample cities, the number of sample cities in each country or region was determined on the basis of population and per-capita income.

Then, select sample cities from each country or region involved based on the principle of searching from the largest to smallest, best to worst, and highest to lowest.

Lastly, necessary adjustments were made to ensure the availability of accurate and standard statistics for every sample city.

The 505 cities selected according to the above steps spread across the six continents, 130 countries and regions, including 186 Asian cities, 143 European cities, 100 North American cities, 36 African cities, 28 South American cities, and 12 Oceanian cities. Based on the development stage of the cities determined by their GDP per capita, the 505 cities were divided into four groups. There are 91 cities with GDP per capita of more than USD 40,000, 72 cities with GDP per capita between USD 30,000 and 39,999, 74 cities with GDP per capita between USD 10,000 and 29,999, and 268 cities with GDP per capita below USD 10,000. The 505 sample cities are basically representative of cities today in different parts of the world and at different development stages. Please refer to the Consolidated Global Urban Competitiveness (Potential Competitiveness) Index in Chap. 1 for the list of the 505 sample cities.

### **2.5.3 Data Sources**

The global urban competitiveness study requires a large amount of high-quality data. Data collection started in July last year to organize the translation and collection of data in many languages, including English, French, German, Spanish, Portuguese, Italian, Arabian, Russian, Japanese, Korean etc. from various channels, including official statistical publications, official websites and academic research findings. In this process, we also received a lot of help from researchers and research organizations from other countries, as well as students abroad. After nearly half a year of searching and collation, we covered a decent number of indicators. To address the differences in statistical standards in different countries, we first delved into the statistical data and standards of international organizations such as the statistical distributions of the United Nations Statistics Division (UNSD), World Development Indicators of the World Bank and the Organization for Economic Co-operation and Development (OECD) database. Then, the actual situation of the various countries were consolidated to establish a statistical standard that is statistically appropriate, easily comparable and with a most extensive coverage, before applying such standard to the data collection and processing stages to arrive at a unified database of 505 international cities. The measured data of the 22 indicators used here was mainly obtained from three sources. The statistical organizations of various countries, international statistical organizations, international research organizations or thematic reports and research data of companies are also major

sources of data for this report. Please refer to the GUCP database for specific details of these sources and notes on the indicators.

Nevertheless, due to the restrictions of subjective and objective conditions, some of the more unique cities had to be removed and some of the key indicators had to be adjusted or deleted. These are regrettable imperfections for this project and we hope that there will be breakthroughs in future research work.

## 2.6 Evaluation Method

The integration of multiple indicators is a mathematical challenge. The current methods and ways of measurement for the urban competitiveness index are: principal component analysis, factor analysis, analytical hierarchy process and variance analysis. However, they are not without flaws. The research combined these methods to get the best result possible.

**Firstly, run the various indicators through a non-dimensional process.** The dimensions for various indicator data on global urban competitiveness are different and it is necessary to conduct non-dimensional processing of all indicator data. The research utilizes 4 methods: Standardization, indexing, thresholding and percentaging.

Standardization Formula:  $X_i = \frac{(x_i + \bar{x})}{Q^2}$ , in which  $X_i$  is the value of  $x_i$  after conversion,  $x_i$  is the raw data,  $\bar{x}$  is the average value,  $Q^2$  is the variance, and  $X_i$  is the data after standardization.

Indexing Formula:  $X_i = \frac{x_i}{x_{0i}}$ , in which  $X_i$  is the value of  $x_i$  after conversion,  $x_i$  is the raw value,  $x_{0i}$  is the maximum value, and  $X_i$  is the index.

Thresholding Formula:  $X_i = \frac{(x_i - x_{Min})}{(x_{Max} - x_{Min})}$ , in which  $X_i$  is the value of  $x_i$  after conversion,  $x_i$  is the raw value,  $x_{Max}$  is the maximum sample value, and  $x_{Min}$  is the minimum sample value.

Percentaging Formula:  $X_i = \frac{(n_i)}{(n_i - N_i)}$ , in which  $X_i$  is the value of  $x_i$  after conversion,  $x_i$  is the raw value,  $n_i$  is the number of sample indexes lower than  $x_i$ , and  $N_i$  is the number of sample indexes other than  $x_i$  that is higher than or equal to  $x_i$ .

**Secondly, calculate the tier-2 competitiveness indexes.** Adding weights to the various indicators that were processed non-dimensionally to obtain various competitiveness sub-indexes. The formula is:

$$z_{ij} = \sum_j z_{ij}$$

$z_{ij}$  represents the various competitiveness sub-items;  $z_{ij}$  represents the various indicators included in the competitiveness sub-items.

**Thirdly, calculate the overall global urban competitiveness scores and rankings.** The report utilizes principal component analysis to calculate the overall global urban competitiveness scores and to rank the cities according to the overall scores. The calculation method and steps are given below:

**(1) Matrix for calculating covariance**

Covariance matrix for the calculation of sample data:  $\Sigma = (s_{ij})_{p \times p}$ , of which:

$$S_{ij} = \frac{1}{n-1} \sum_{k=1}^n (X_{ki} - \bar{X}_i)(X_{kj} - \bar{X}_j) \quad i, j = 1, 2, \dots, p$$

**(2) Determination of the eigenvalue  $\lambda_i$  of  $\Sigma$  and the corresponding orthogonal unit eigenvector  $a_i$**

The larger first  $m$  eigenvalues of  $\Sigma$ ,  $\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_m \geq 0$ , is the variance corresponding to the first  $m$  principal components, the eigenvector unit  $a_i$  corresponding to  $\lambda_i$  is the co-efficient of the original variable of the principal component,  $F_i$ . The  $i$ th principal component,  $F_i$ , of the original variable:

$$F_i = a_i'X$$

The variance contribution rate of the principal component is used to reflect the amount of information,  $\alpha_i$ :

$$\alpha_i = \lambda_i / \sum_{i=1}^m \lambda_i$$

**(3) Selection of principal components**

Finally, a few principal components need to be selected, i.e.  $F_1, F_2, \dots$ ; the determination of  $m$  in  $Fm$  is achieved through cumulative contribution of variance  $G(m)$ :

$$G(m) = \sum_{i=1}^m \lambda_i / \sum_{k=1}^p \lambda_k$$

When the cumulative contribution is greater than 85%, the information is considered to be a substantial reflection of the original variable, and the corresponding  $m$  is the first  $m$  principal components extracted.

**(4) Calculation of principal component loading**

Principal component loading reflects the degree of interrelation between principal component,  $F_i$  and original variable  $X_j$ , the loading  $l_{ij}$  ( $i = 1, 2, \dots, m; j = 1, 2, \dots, p$ )

of the original variable,  $X_j (j = 1, 2, \dots, p)$  on the principal components  $F_i (i = 1, 2, \dots, m)$ .

$$l(Z_i, X_j) = \sqrt{\lambda_i a_{ij}} \quad (i = 1, 2, \dots, m; j = 1, 2, \dots, p)$$

In the principal components results analyzed by the SPSS software, the “component matrix” reflects the principal component loading matrix.

### (5) Calculation of principal component scores

Calculation of the scoring of the sample on  $m$  number of principal components:

$$F_i = a_{1i}X_1 + a_{2i}X_2 + \dots + a_{pi}X_p \quad i = 1, 2, \dots, m$$

Indicator dimensions are often different during practical application. It is, therefore, necessary to eliminate dimensional influence before the calculation of principal components. There are many ways of eliminating dimensional influence in data. A common method is the standardization of raw data, and to convert the data using the following formula:

$$X_{ij}^* = \frac{X_{ij} - \bar{X}_j}{S_j} \quad i = 1, 2, \dots, n; j = 1, 2, \dots, p$$

of which:  $\bar{X}_j = \frac{1}{n} \sum_{i=1}^n X_{ij}$ ,  $S_j^2 = \frac{1}{n-1} \sum_{i=1}^n (X_{ij} - \bar{X}_j)^2$

## 2.7 Special Notes

Urban competitiveness is a profound and complex topic and looking at it from different perspectives, using different methodologies or targeting at different population groups can generate different conclusions. The evaluation system for global urban competitiveness is built upon the model created by Dr. Ni Pengfei in *China Urban Competitiveness Report* and improvements were made by taking into consideration the latest development trends in the world's urban areas and the many factors affecting urban competitiveness, as well as research work of other organizations and institutions around the world on national and urban competitiveness, encompassing theories in urbanization, urban economics, spatial economics, etc. The analytical framework and main thoughts on competitiveness in this book is of the same strain as that found in *China Urban Competitiveness Report*, learning much from it in setting up the indicator system. However, due to changes in research subject, research topic and target audience, as well as limitations during the process of data collection, the competitiveness evaluation system and calculation method in this book is slightly different from the one found in *China Urban Competitiveness Report*. In the spirit of academic prudence, the results and main

conclusion indicated by the indicator system in this book are not directly comparable to those in *China Urban Competitiveness Report*. We suggest that readers view the two studies as a gauge of urban competitiveness from different angles and levels.

## References

- Begg, I. 1999. Cities and competitiveness. *Urban Studies* 36 (5): 795–809.
- Begg, I. 2000. *Urban competitiveness: Policies for dynamic cities*. Bristol: Policy Press.
- Cheshire, P., G. Carbonaro, and D. Hay. 1986. Problems of urban decline and growth in EEC countries: Or measuring degrees of elephantness. *Urban Studies* 2: 131–149.
- Duffy, H. 1995. *Competitive cities: Succeeding in the global economy*. London: Routledge.
- Boddy, Martin. 1999b. Geographical economics and urban competitiveness: A critique. *Urban Studies* 36: 811–842.
- Friedmann J. 1995. *Where we stand: A decade of world city research*. Knox P L. and Taylor P J. *World cities in a world system*, Cambridge: Cambridge University Press.
- Lever, W.F. 1999. Competitive cities in Europe. *Urban Studies* 36 (5): 1029–1044.
- Linnamaa. 2001. The role of the city government in the urban economic development network. *Professionals and Public Expectations* 22–25.
- Logan, J., and H. Molotch. 1987. *Urban fortunes: The political economy of place*. Berkeley, CA: University of California Press.
- Longnan, Liang. 1998. A study on urban planning and development of Korea. *Urban Planning Overseas* 2: 35–41.
- Martin, L.E. van Duren, R. Westgren and M. Le Maguer. 1991. *Competitiveness of Ontario's Agri-food sector*, prepared for the Government of Ontario, May.
- Mattoo, A., R. Rathindran, and A. Subramanian. 2001. Measuring services trade liberalization and its impact on economic growth: an illustration. *World Bank Working Paper*, No. 2655.
- Meadows, D.H., D.L. Meadows, J. Randers, W.W. Behrens, and Rome Club. 1972. *The limits to growth*. New York: Universe Books.
- Molotch, H. 1976. The city as a growth machine: Toward a political economy of place. *American Journal of Sociology* 82: 309–330.
- Montgomery, C.A., and M.E. Porter. 1991. *Strategy: Seeking and securing competitive advantage*. Boston, Mass: Harvard Business School Press.
- Ni, Pengfei, and Peter Karl Kresl. 2006. *Global Urban Competitiveness Report*. Beijing: Social Sciences Academic Press.
- OECD. 2006. *OECD territorial reviews, competitive cities in the global economy*. Paris: OECD Publications.
- OECD. 2008. *Competitive cities and climate change: OECD conference proceedings*. Paris: OECD Publications.
- Parkinson, M., M. Hutchins, J. Simmie, G. Clark, and H. Verdonk. 2004. Competitiveness European cities: Where do the core city stand, Final report to core cities working group, Oct.
- Parr, J.B. 1979. Regional economic change and regional spatial structure: Some interrelationships. *Environment and Planning A* 11: 825–837.
- Parr, J.B. 2002. Missing elements in the analysis of agglomeration economies. *International Regional Science Review* 25: 151.
- Schumpeterian, Joseph. 1961. *The theory of economic development: An inquiry into profits, capital, credit, interest and the business cycle*. NY: Oxford University Press.
- Sotarauda, M., R. Linnamaa. 2001. Urban competitiveness and management of urban policy networks: Some reflections from Tampere and Oulu. *Technology, Society and Environment* 2.

- Yong, Mao. 2002. On talent strategy of Singapore and its promotion to economy. *Around Southeast Asia* 9: 21–24.
- Pengfei Ni. (2001–2015). *China urban competitiveness report*. Beijing: Social Sciences Academic Press.
- Heilbroner, Robert. 1970. On the limited relevance of economics. *The Public Interest* 21 (fall): 80–93.
- Ni, Pengfei. 2010. *Global urban competitiveness report 2010*. UK: Edward Elgar Cheltenham.
- Ni, Pengfei. 2011. *Global urban competitiveness report 2011*. UK: Edward Elgar Cheltenham.
- Ni, Pengfei. 2013. *Global urban competitiveness report 2013*. UK: Edward Elgar Cheltenham.
- Peter, Karl. 2005. The determinant urban competitiveness: A survey, In: *North American cities and the global economy*, ed P.K. Kresl and G. Gappert, 45–68.
- Porter, M.E. 1985. *The competitive advantage: Creating and sustaining superior performance*. New York: Free Press.
- Porter, M.E. 1990. *The comparative advantage of nations*. New York: Free Press.
- Porter, M.E. 1996. Competitive advantage, agglomeration economies, and regional policy. *International Regional Science Review* 19: 85–90.
- Porter, M.E. 1998a. Clusters and the new economics of competition. *Harvard business review* 76: 7–90.
- Porter, M.E. 1998b. *The microeconomic foundations of economic development*. The Global Competitiveness Report 1998, World Economic Forum.
- Porter, M.E. 2000. Location, competition, and economic development: Local clusters in a global economy. *Economic Development Quarterly* 14: 15.
- Porter, M.E. 2001. Innovation: Location matters. *MIT Sloan Management Review* 4: 42.
- Porter, M.E. 2003. The economic performance of regions. *Regional Studies* 37: 6–7.
- Posner, Michael V. 1961. International trade and technological changes. *Economics and Social Sciences* 13 (3): 323–341.
- Prahalad, C.K. and Hamel, G. 1990. The core competence of the corporation. *Harvard Business Review* 79–91.
- Robert, E.Lucas. 1988. On the mechanics of economic development. *Journal of Monetary Economic* 22: 3–42.
- Roberto, Camagni. 2002. Urban mobility and urban form: The social and environmental costs of different patterns of urban expansion. *Ecological Economics* 40: 199–216.
- Romer, Paul. 1986. Increasing returns and long run growth. *Journal of Political Economy* 67–68.
- Rondinelli, Dennis A. 1998. The changing forces of urban economic development: Globalization and city competitiveness in the 21st century. *Cityscape* 3 (3): 36.
- Solow, Robert. 1970. Science and ideology in economics. *The Public Interest* 21 (Fall): 94–107.
- Taylor, P.J. 2004a. *The World City Network*. London: Routledge.
- Taylor, P.J. 2004b. Competition and cooperation between cities in globalization. *GaWC Research Bulletin* 351 (A).
- Taylor, P.J., and Pengfei Ni. 2010. *Global urban analysis*. London: Earthscan Press.
- Ronald I. McKinnon. 1976. *Money and finance in economic growth and development: Essays in honor of Edward S. Shaw, editor and contributor*. New York: Marcel Dekker.
- Gruber, William, Dileep Mehta, and Raymond Vernon. 1967. The R&D factor in international trade and international investment of United States industries. *Journal of Political Economy* 25 (1): 20–37.
- Hong, Sha. 2004. The strategy of Singapore's education and talents. *Journal of Tianjin Academy of Educational Science* 12: 6.
- Rosenthal, S.S., and W.C. Strange. 2003. Geography, industrial organization, and agglomeration. *Review of Economics and Statistics* 85 (2): 377–393.
- Sassen, S. 1994. *Cities in world economy*. London: Pine Forge Press.
- Saxenian, AnnaLee. 1994. *Regional advantage: Culture and competition in silicon valley and route*. New York: Harvard University Press.
- Scott, A., and E. Soja. 1986. Los Angeles: The capital of the twentieth century. *Environment and Planning, D: Society and Space* 4: 201–216.

- Stone, C. 1989. *Regime politics: Governing Atlanta, 1946–1988*. Lawrence KS: University Press of Kansas.
- Storper, M. 1997. *The Regional world: Territorial development in a global economy*. New York: Guilford.
- Tang, Hua. 2000. *U.S. government management-phoenix as an example*. Beijing: Renmin University Press of China.
- Terrence, E.Deal, and A.Kennedy Allan. 1999. *Revitalizing the workplace after downsizing, mergers, and reengineering*. Cambridge, MA: Perseus Publishing.
- Terrence, E.Deal, and A.Kennedy Allen. 1982. *Corporate cultures: The rites and rituals of corporate life*. Reading, MA: Addison-Wesley Publishing.
- Terrence, E. Deal and Allan, A. Kennedy. 1982. Corporate culture. *The American Economic Review* 56–58.
- Theodore, W.Schultz. 1962. *Investment in human beings*. Chicago: University of Chicago Press.
- Thompson, G.F. 2003. *Between hierarchies and markets: The logic and limits of network forms of organization*. Oxford: Oxford University Press.
- Thünen, J.H.V. 1966. *Isolated state; an English edition of Der isolierte Staat*. New York: Pergamon Press.
- Timmer, Marcel P., and Adam Szirmai. 2000. Productivity growth in Asian manufacturing: The structural bonus hypothesis examined. *Structural Change and Economic Dynamics* 11 (4): 371–392.
- Van den Berg, Leo and Antonio Paolo Russo. 2007. *The impacts of culture on the economic development of cities*. Rotterdam: EURICUR.
- Verikios, G. and X-G Zhang. 2001. *Global gains from liberalizing trade in telecommunications and financial services*. Productivity Commission Staff Research paper, No. 1683.
- Weber, A.Y. 1909. *Theory of the location of industries*. Chicago: The University of Chicago.
- Webster, D., and L. Muller. 2000. *Urban competitiveness assessment in developing country urban regions: The road forward*. Washington, D.C: Urban Group, INFUD, The World Bank.
- World Bank. 2009. *Doing business 2009*. <http://www.doingbusiness.org>. Accessed 10 Sep 2008.
- World Bank. 2010. *Doing business 2010*. <http://www.doingbusiness.org>. Accessed 9 Sep 2009.
- Griliches, Zvi. 1957. Hybrid corn: An exploration in the economics of technological change. *Econometrical* 25 (4): 501.
- Guang, Zhao. 1994. Looking at China's urban history from a macroscopic perspective. *Social Science in China* 15 (3): 171–179.
- Ye, L. 2004. *Is Shanghai really a global city?*. Chicago: International conference on Globalization and Urban Change.
- Zhang, T. 2000. Urban sprawl in China: Land market force and government's role. *Cities: The International Journal of Urban Planning and Studies* 17(1).
- Zhang, Tingwei. 2001. Community feature and urban sprawl: The case of the Chicago metropolitan region. *Land Use Policy* 18: 221–231.
- Zhang, L., and X.B. Zhao. 2001. The impact of state resource allocation on urbanization in socialist China. *Post-Communist Economies* 13 (4): 505–524.
- Zhu, J. 1999. *The transition of China's urban development: From plan-controlled to market-led*. London: Praeger, Publishers.

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