The review of Urban Competitiveness study

ZHANG Tian-Hai TANG Li-na* WANG Hao-Wei
LI Yu-Liang ZHENG Ru-Bin

Abstract—Since the 1980s, increasing global economic integration has resulted in greater competition between cities, and urban competitiveness has been studied by economists, geographers, urban planners and other researchers. The urban competitiveness theory and practical application has great strategic meaning on the guidance for the sustainable healthy urbanization. This paper reviews and analyses advances by scholars on the theoretical basis of the urban competitiveness concept, influencing factors and evaluation model, and give a perspective view about the theoretical research and practical application of the urban competitiveness theory.

Keywords—urban; competitiveness; typical theory; model; review

I. Introduction

Since 80's of the twentieth Century, the global competition became fiercer and fiercer day by day. Urban competition emerged and become more and more important [1][2]. Enhancing of the urban competitiveness has gradually become important station strategy. Research of urban competition and competitiveness includes many subjects such as economics, geography, urban planning. This paper give a brief about the origination, connotation, assessment methods of urban competitiveness and propose commentary upon main typical theories in order to benefit the research on urban competitiveness.

First Author :ZHANG Tian-Hai

University: Institute of Urban Environment, Chinese Academy of Sciences
Country: China

Corresponding author: TANG Li-na
University: Institute of Urban Environment, Chinese Academy of Sciences
Country: China

Third Author :Wang Hao-Wei
University: Institute of Urban Environment, Chinese Academy of Sciences
Country: China

Fourth Author : LI Yu-Liang
University: Research Center for Eco-Environmental Sciences, Chinese
Academy of Sciences

Fifth Author : ZHENG Ru-Bin
University: Institute of Urban Environment, Chinese Academy of Sciences
Country: China

II. Derivation, Connotation and affecting factors of the urban competiveness

A. Derivation

Competence research derive from concerns about the products and industry competition on the micro level and the macro level of national competition, then it gradually turned to the middle level-urban competition. Porter (Michael E Porter) and Webster (Douglas Webster) both studied them[3].

Porter made a systematic research on the competitiveness theory and provide the theoretical foundation. Kresl (Peter Karl Kresl) in Bucknell University did pioneering work in this area [1] .In 90's of the twentieth Century, he published three papers on urban competitiveness. Meanwhile, Dennis (Dennis A. Rondinelli) in University of North Carolina began to study the international competitiveness of metropolitan areas. In addition, in the early times, Begg (Iain Begg), Webster, Boddy (Martin Boddy), Malecki (Edward J Malecki) did research on competition process, influence factors and evaluation model of urban competition[3].

B. Connotation and affecting factors

In the understanding and definition for the connotation of urban competitiveness, different scholars have different views. Urban competitiveness needs the measurement way while the measurement needs establishment of the standards. Scholars have various points on the criteria because it is not only a judgment about the elements selection, but also relates to value judgments.

Up to now, there are eight typical urban competitiveness theories focusing on different sides. Their key contents are displayed below(table Ⅰ).

In the following this paper is going to discuss the main characteristics of typical competitiveness theories in the table.

III. Urban competitiveness model in the typical theory

Various research about the affecting factors could be classified into two categories: hard capital or soft capital[2]. The former includes urban geography, infrastructure, enterprises and mineral resources, The latter includes institution, culture, education and so on. Most

theories focused on economic factors- hard capital due to that it's obvious and easy to quantify and measure. However, more and more researches show that the human resources, institutional environment, cultural background, education and other factors become more and more important to explain the competitive and even became core factors, soft capital is playing an increasingly important role in the urban sustainable development.

TABLE I.　　MODEL LIST OF URBAN COMPETITIVENESS

Scholars or Organization	Typical theory	Factors
Kresl	Double frame model	Revealed frame factors: added value; retail sales; business service income. Explanatory framework factors: economic; strategic.
Porter	Diamond theory Model	Four factors: manufacture factor; demand; performance of supporting and related industry; strategy, structure and competitor of enterprise.
IMD	National competitiveness Model	Four relation pairs: localization and globalization; attraction and expansion; assets and process; individual spirit of adventure and social cohesion. Eight factors: domestic economic; internationalization; government management; financial system; infrastructure; enterprise management; science and technology; nation quality.
Dennis	International competitiveness of metropolitan	Four factors: the local urban environment; economy factors; obedience of international trade agreements; local enterprises competitiveness in metropolitan.
Webster	Four categories Model	Four categories: economic structure; Territorial Endowments; human resources; institution Milieu.
Linnamaa	Six elements Model	Six elements: Firms; infrastructure; human resources; Memberships in networks; Institutions and effective policy-networks; Quality of living environment.
Begg	Maze model	Four factors: Top-down sectoral trends and 'macro' influences; Company characteristics; The Business Environment; Capacity for innovation and learning.
Gardiner	The Pyramid model	Eight factors: economic structure; innovation; regional accessibility; labor skills; environment; decision center; social structure; regional culture.

A. *Assessment system*

Kresl and Dennis share the similar analysis framework, Kresl used two categories to unify all kinds of factors affecting the urban competitiveness: Economics or strategy ones, which have secondary factors. The former focuses on microeconomic factors, while the latter pays attention to the macro factors.

For the period 1977-92, the equation used to generate the competitiveness ranking is[1]:

$$C = 0.528RS + 0.388MVA + 0.084BSR$$

where, C: Urban competitiveness ranking; RS: retail sales; MVA: manufacturing valued added; and BSR: business service receipts. with data for the growth of each during 1977-92.

Kresl did pioneering work in this area. His theory derive from two aspects including both the quantitative calculation(try to quantization the competitiveness) and qualitative analysis . This approach was later inherited by many scholars. Moreover he also pay attention to the non-economic factors, but these factors are difficult to identify and quantify. Kresl focused designing index for evaluation on urban competitiveness while lack analysis of the relationship between the various factors.

Porter proposed four factors in his diamond model which mainly related with the enterprise or industry in micro level. On the contrary, the Swiss IMD (International Institute for Management Development) mainly focus on macro level, proposing four relation pairs and eight basic factors (Table 1) affecting competitiveness[6].

The global competitiveness report by WEF considered three competition factors of macroscopic and microcosmic. Among them, McArthur's GCI (Growth Competitiveness Index) mainly consider the macroeconomic factors (Fig.1), Porter believes that although the stability of the institution, law, policy create wealth potentially, but they themselves couldn't create wealth directly, therefore it need to add micro indexes, thus he proposed BCI (Business Competitiveness Index), focusing on the microcosmic factors (Fig.2). As shown in the chart, GCI system and BCI investment driven stage are both putting the stability of institution, education and the nation in important place.

In 2004, WEF use GloCI system to replace the GCI, BCI for the global competitiveness report. GloCI includes 178 criteria in 11 aspects such as military, environment (30 criteria), technology, institution (35 criteria) and consider the military expenses for the first time. Though GloCI has a integrated system, it is hard to monitor the comparative advantage. Considering this, Şule Önsel selected the 178

criteria using artificial neural network method. He also criticized the WEF estimation based on GDP and emphasized the decisive role of state intelligence or knowledge capital, political and economic stability[6].
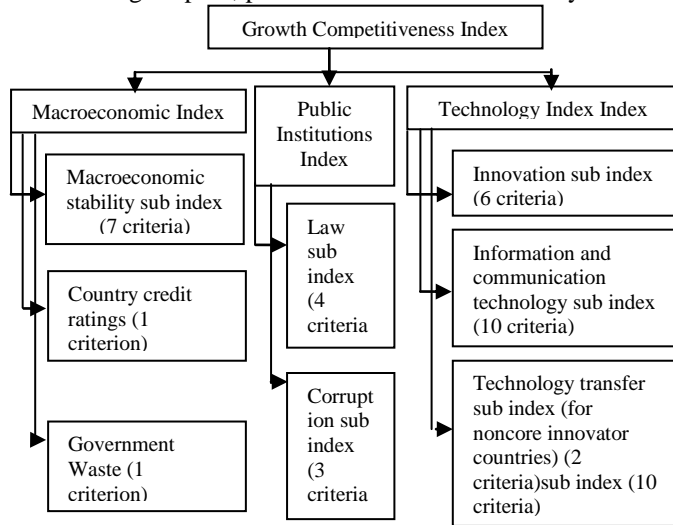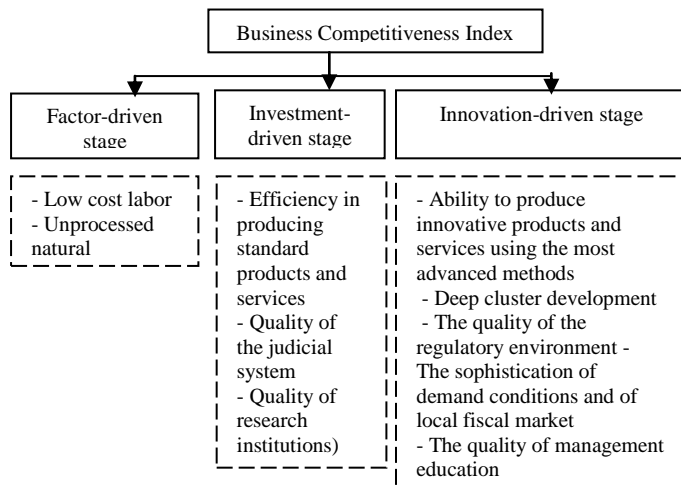

Figure 1.   GCI system (Şule Önsel, 2008)

Figure 2.   BCI system (Şule Önsel, 2008)

B. *Construction model*

Webster, Muller (Larissa Muller) believe there are four assessment categories and mention the Territorial Endowments as special[3](Fig.3). Linnamaa give 6 elements[7](Fig.4) and emphasize the net-cooperation, he also mention the life environment.

Begg (1999) in UK make analysis of the interactive relationship among each elements and emphasize the importance of innovation and learning ability (Fig.5)[8]. His "learning city" theory was pushed ahead by Lundvall etc[2][4]. Gardiner proposed the Pyramid model (Fig.6)[9] with a clear vertical hierarchical relationships. Both their theories are putting the life quality as the ultimate goal, believing that performance of revealed competitiveness contain two main aspects: productivity and employment rate.
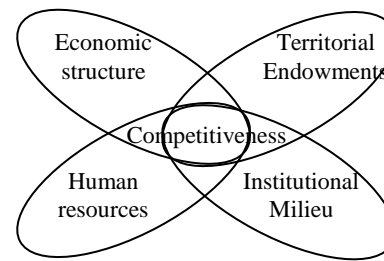

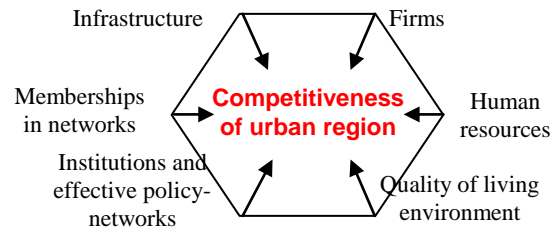Figure 3.   Webster's modle (Douglas Webster, 2000)

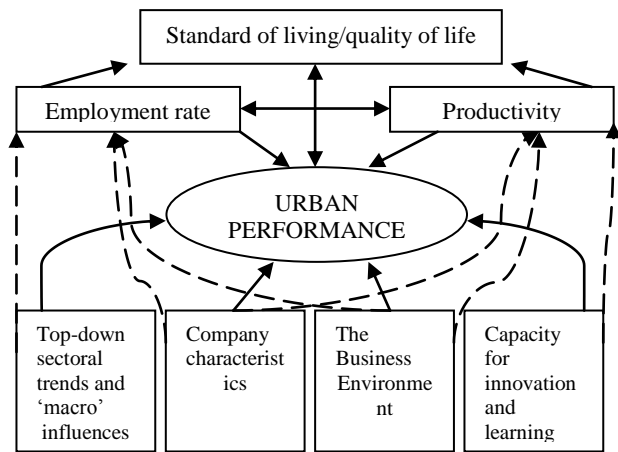Figure 4.   Linnamaa's model (Linnamaa, 1999)
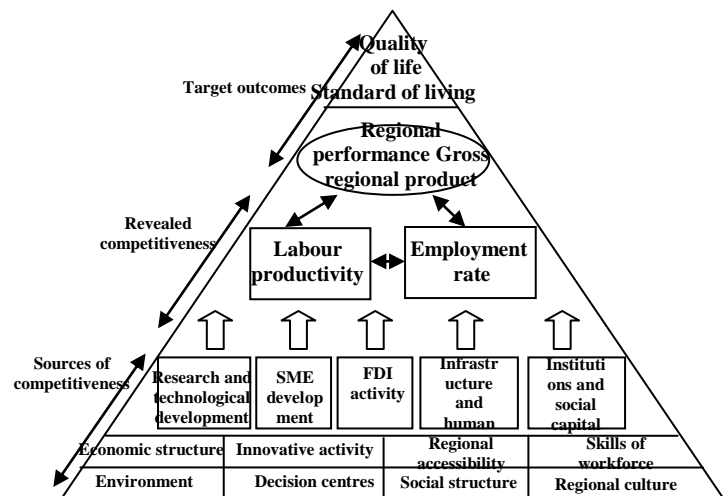

Figure 5.   Maze model(Iain Begg, 1999)

Figure 6.   Pyramid model(Ben Gardiner, 2004)

C. *New trend*

For others, Boddy, Krugman emphasize the international trade and close relationship between regions and cities based on the geographical economic view[5]. In Boddy's book published in 2004, he studied about the relationship between competiveness and urban governance[10]. Recently, culture, environment, institution and planning come to attract notation day by day for their increasing importance of enhancing the competitiveness and began to be regarded as the core part. Among them, Zanakis (Stelios H Zanakis) reveals the importance of policy stability, scientific research, education by analysis based on neural network model, classification and regression tree model[11]. Benneworth (Paul Benneworth) focus on the great importance of university education in in the era of knowledge economy while Bontje believes that the basic education play a more important role[12][13]. In the third chapter of book "Governing Cities in a Global Era: Urban Innovation, Competition, and Democratic Reform" by Hambleton (Robin Hambleton), Gross (Jill Simone Gross) of the new "management under Globalization: city innovation, competition and the democratic process", there are number of pages talking about the importance of the local institution[14]. Chorianopoulos (I. Chorianopoulos) defined the urban competitiveness as planning intervention under the policy guidance[15]. Bertrand (N. Bertrand) talked about relationship between urban competitiveness and land management regulation by studying the development planning in Britain, France and Germany, and span[16]. In other sides, Funck (Rolf H. Funck) in German advocated the "cultural multiplier" to measure the benefits brought by the special cultural activities in the various regions, taking Karlsruhe as an example[17]. Peters (Alan H. Peters) and Fisher (Peter S. Fisher) measured the affection of government stimulus behavior such as tax upon the region competitiveness [18].

Acknowledgment

References

[1] Peter Karl Kresl, Balwant Singh. Competitiveness and urban economy: Twenty-four large US metropolitan areas. Urban Study, 1999,36[5-6]: 1017~1027.

[2] Edward J Malecki. Hard and Soft Networks for Urban Competitiveness. Urban Study, 2002,39[5-6]: 929~945.

[3] Douglas Webster, Larissa Muller: Urban competitiveness assessment in developing country urban regions: the road forward[R]. Paper prepared for Urban Group, INFUD*. 2000.

[4] Tim Campbell. Learning cities: Knowledge, capacity and competitivess. Habitat International, 2009, 33: 195~201.

[5] Martin Boddy. Geographical Economics and Urban Competiveness: A Critique. Urban Study, 1999, 36[5-6]: 811~842.

[6] Şule Önsel, Füsun Ülengin, Gündüz Ulusoy. A new perspective on the competitiveness of nations. Socio-Economic Planning Sciences, 2008, 42: 221–246.

[7] Markku Sotarauta, Reija Linnamaa. Urban Competitiveness and Management of Urban Policy Networks: Some Reflections from Tampere and Oulu. Paper presented in Conference Cities at the Millenium. 1998.

[8] Iain Begg. Cities and Competitiveness. Urban Study, 1999, 36[5-6]: 795~809.

[9] Gardiner B., Martin R. and Tyler P. Competitiveness, productivity and economic growth across the European regions, Regional Studies, 2004,38, 1037–1059.

[10] Martin Boddy, Michael Parkinson (Eds.). City Matters: Competitiveness, Cohesion and Urban Governance The Policy Press, Bristol, UK, ISBN 1-86134-444-9 (pbk), xvi+448 pp. 2004.

[11] Stelios H Zanakis, Irma Becerra-Fernandez. Competitiveness of nations: A knowledge discovery examination. European Journal of Operational Research, 2005[166]: 185~211.

[12] Paul Benneworth, Gert-Jan Hospers. Urban competitiveness in the knowledge economy: Universities as new planning animateurs. Progress in Planning, 2007[67]: 105~197.

[13] Marco Bontje, Sako Musterd. Creative industries, creative class and competitiveness: Expert opinions critically appraised. Geoforum, 2009,40: 843–852

[14] Robin Hambleton, Jill Simone Gross. Governing Cities in a Global Era: Urban Innovation, Competition, and Democratic Reform. Palgrave MacMillan, New York and Houndsmills, Basingstok, Hampsire England, ISBN 978-0-23060-230-4.

[15] I. Chorianopoulos*, T. Pagonis, S. Koukoulas. Planning, competitiveness and sprawl in the Mediterranean city: The case of Athens. Cities, 2010, 27: 249–259.

[16] N. Bertrand, V. Kreibich. Europe's City-Regions Competitiveness: Growth Regulation and Peri-Urban Land Management, (Eds.). Von Gorcum, Asssen. iiD188 pp., V27.50 pbk, ISBN: 90-232-4183-5. 2006.

[17] Jolanta Dziembowska-Kowalska, Rolf H. Funck. Cultural activities as a location factor in European competition between regions: Concepts and some evidence. Regional Science, 2000[34]: 1~12.

[18] Alan H Peters, Peter S Fisher. Measuring the competitiveness of state and local economic development. Comput. Environ. and Urban Systems, 1995, 19[4]: 261~274.