

# Deconstruction of Urban Competitiveness within City Network Perspective

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## Abstract

Ignorance or scarcity of attention about external relations of cities is the main defects existed in the current urban competitiveness research. Considering this situation, based upon brief comments on the traditional urban competitiveness research and drawing on the research paradigm of "the new urbanism", this paper made an in-depth analysis on the competition duality of inter-city relations from city network perspective, cast light on the dual sources from which the city obtain competitive advantages, and deconstructed the urban competitiveness from city's competition relation perspective to preliminary construct a conceptual model of urban competitiveness within city network perspective, thus providing a new analytical framework to further improve the theoretical research and scientific explanation of the urban competitiveness study.

**Keywords:** City Network, Urban Competitiveness, Competition Relations, Conceptual model

## 1. Introduction

The former research of urban competitiveness has been solely focused on internal goings-on of cities, emphasizes the competitive

relationship between cities, while the internal relations of cities and their important role in obtaining competitiveness to cities has been largely ignored. Constrained by the traditional urban system theory paradigm, although some studies focused on regional or Megalopolis perspective begins to pay attention to external relations of cities, they are generally seek to prove inter-city relations through certain attributes of cities, which is not a relational analysis actually so that it is difficult to reveal the essence of inter-city relations[1]. All of this has resulted in that the evaluation of urban competitiveness is insufficient of scientific and comprehensive, the conclusion is unconvincing and the theoretical studies are often inconsistent with the urban development practices. In other words, ignorance or scarcity of attention about external city relationship is the main defects existed in the current urban competitiveness research.

With the rise of "the new urbanism"[2], their city network research paradigm and studies about inter-city relations has become one of the frontiers of current city research internationally. Within city network perspective, competitiveness of single city is affected by both internal and external relation factors. This undoubtedly offers a completely new view to overcome the insufficiency existed in current urban competitiveness study.

Based on brief comments on the urban competitiveness research status at home and abroad, and drawing on the research paradigm of "the new urbanism", the paper try to deconstruct the urban competitiveness and preliminary construct a conceptual model of urban competitiveness within city network perspective.

## 2. Review of the urban competitiveness

Since the 1990s, competitiveness has become a "strong issue" of public policy system in developed countries [3], after Porter [4] successfully set up a connective bridge between the micro-enterprises and macro-region with competitiveness and put forward the idea of the competitiveness of locations. Approximately marked by the "Urban studies"[5] magazine of U.K. published in 1999 and "Urban competitiveness"[6] published in 2002, the issue of urban competitiveness begins to turn into research hotpot of related institutes and many disciplines, meanwhile with a large number of relevant research literature emerging and growing.

Most of the studies abroad construct a conceptual or evaluation model on the basis of the connotation of urban competitiveness, and then analyze the question from a theoretical or empirical perspective, up to the final purpose of providing a theoretical foundation for city government to make competitiveness promoting strategies or urban development policies, in which theoretical model construction is an important part.

In the perspective of single city, foreign scholars mainly discuss from two aspects: urban supply and urban demand. The aspect of supply [7] follows the logic of inputs namely

competitive assets of city or economic foundation (e.g., innovation, financial, human and physical capital) → outputs (e.g., GDP per capital) → outcomes (e.g., earnings) to construct evaluation model. For example, Deas & Giordano [8] combined the "inputs" and "outputs" of cities organically and advanced "assets-output" model. While model on the point of view of demand is based on the hypothesis that urban competitiveness can be interpreted as the interaction between the cities and the manufacturer that the cities are willing to enhance their competitive capacity as much as possible to attract manufacturers to entry and provide jobs. Kresl & Proulx[9] made a quantitative analysis and ranked 40 American cities and 7 Canadian cities on 15 years data. In addition, "diamond" model [4], "maze" model[10] and "pyramid" model[11] are focus explicitly on urban and regional competitiveness theoretically or conceptually. They emphasis on describing spatial competition, and consider that a variety of input measures may be revealed output measures and then show outcome measures. According to recently empirical researches on urban competitiveness by relevant institutions and scholars in Europe and United States[7,12-13], the measurement indicators (influence factors) are mainly referred to 8 aspects of single city in summary: human capital, firm capital, innovation, physical capital, outcomes, financial capital, quality of life and output.

Overall, the competitiveness of city research in the perspective of single city has been relatively matured abroad. In different periods, based on different definitions, methods and purposes, there have been extensive studies from different aspects by selecting different factors and priorities. Furthermore, the

measurement method has experienced a change from simple comparative analysis of single factor to empirical analysis of many factors, and the measurement indicators are subtly characterized as revealed and explanatory. However, inter-city relations and their influence on competitiveness of cities are ignored to a great extent.

Researches about urban competitiveness in China started in about 1990s, which is later than western countries. On the basis of western theory and model, most researches mainly focus on empirical analysis, with many thesis published but lack of theoretical paradigm. Analogous to foreign countries, early domestic studies were limited to mega cities directly participated in international competition in deputy of the nation [14]. And China is different from western countries in the stage of urbanization development journey. With China's rapid development of regional economy, urban agglomeration and city clusters arose in succession. In recent years, domestic urban competitiveness research gradually developed to cover the ranking of cities in various scale. Because of the evaluation models adapted similar to overseas theories and methods based on single city, these researches in the perspective of region are likely to take a one-sided view of emphasizing city competition when we consider different regions in different sizes, grades and development stages[15]. Although there were researchers mentioning metropolitan strategies and urban agglomeration in the promotion of urban competitiveness, it still has its own limitations (Hardly can we find scientific conclusions when we focus only on a single city with ignorance of connections between cities [16]), which led to divorce of the urban

competitiveness research and urban development practice, thus absence of practical significance as well.

In view of this, some scholars tried to improve the urban competitiveness theory with an introduction of the relationship between cities and its affections. Xu Xueqiang and Cheng Yuhong[17] analyzed the changes of urban competitiveness of Pearl River delta by using principal component method, based on the coordinated development of urban agglomeration perspective. Li jie[14] perfected the indicators system by adding indicators of distance between subprime city and the core city, under a comparison research of the advantages of city development in three megalopolises areas. Wang Yunlin, Niu Wenyuan[18] put forward a research idea of a combination of the urban competitiveness and inter-city multidimensional network. Ni Pengfei[19] measured global linkage of cities with numbers of multinational company headquarters and its divisions etc. These researches give a pilot study of urban competitiveness in the perspective of urban agglomeration or urban network. But in general, the theory research is still hanging in the air, which will offer instructions about the selection, construction, measurement of indicators germane to relationships among cities and how to bring in urban competitiveness appraisal system as well. Particularly those researches on the external relationship between cities mainly adopted the traditional theoretical paradigm of city system, which seeking evidences of inter-city relations through some internal qualities of cities. Just as Taylor points out that, though those researches claimed to focus on external relations between cities, these studies were not

real relational analysis, for that they failed to show the essence of the inter-city relations [1].

In conclusion, the limitations of current studies prominently lies on ignorance or scarcity of attention about external relations of cities on constructing theoretical model, despite researches from the perspective of single city have been relatively matured. Taylor calls it "the second nature of cities"[1], which is both the very reason d'être of cities, but also significant sources for cities to obtain competitiveness.

### **3. The rise of the new urbanism and the turn of studies on inter-city relations**

Review on the literatures about inter-city relations delivered by western scholars, there are two main methods[20]: one is called attribute method that tries to describe inter-city relations from certain attributes of cities; the other is called method based on inter-city relations (or relational method) that studies inter-city relations through fetching information about the actual relations between the cities.

The former is the main approach adopted by city system research and early world city studies. Based on the central place theory[21], the city system study emphasizes the hierarchy relationship existed between big cities and small cities, and considers that inter-city relations are vertical, one-way and interactive, which refers to that big cities provides goods and services for small cities, while the horizontal inter-city relations are excluded. So investigations on the scale and distribution of cities come to be the main method for vertical structure studies of city system and this traditional research have had a great influence on the early world city studies. For example,

as representative of the world city research, based on the investigation about multinational companies and the new international division of labor theory, Friedmann [22] emphasized cities' function of capital control center, applied the inter-city relations thought of national urban system to world city system, and proposed the famous "world city hypothesis". Subsequently, researches on hierarchy structure of world city system become the main subject of world city studies. While Sassen[23-24], another representative of the field, states the rising process of world cities from the enterprise microcosmic perspective. She points out that the practical implementation of innovations on contemporary telecommunications and information technologies has incorporated both decentralization and agglomeration of economic activities. Meanwhile, the simultaneity of time has been separated from the contiguity of space because of the development of information communication technology. She proceed to emphasizes on the crucial of advanced producer services, points out that inter-city relation are turning to strength with affiliates of advanced services distributing office networks worldwide, which ultimately resulted in the formation of "transnational urban systems". Although the reason world city to exist lies on the inter-city relationships formatting because of the flows of capital, information and high value labor, most of the researches still only involve investigations on simple attributes aspect of city itself, which are scarcely or never clarify inter-city relations[1].

The latter is the main approach adopted by world city network research. Castells[25] puts forward the concept of "space of flows" and "network society", and considers that space of

flows will replace spaces of places as the dominant form of space. His theory contributes to the world city network analysis as an important theoretical foundation. Based on theory of Sassen and Castells, Taylor [1, 26] conceptualized inter-city network as an interlocking network following Hymer's pioneering micro view [27]. The interlocking network is constituted by three different hierarchies: network level (city network), nodal level (city) and secondary nodal level (various kinds of organization in cities). Among them, the secondary nodes are the basic motive power for the formation and development of inter-city network. Their decision on location of offices and how to use the office formats and develops the city network. Therefore, Taylor concludes that the world city network is a complex amalgam blending with multifarious office networks of corporate service firms and the variety "flows" produced during the process. So it is advanced producer service firms, not cities that are the key actors in world city network formation. In order to produce a seamless service worldwide, they implement location strategies of having offices in global so that transport office network are formatted. Hence it is exactly these firms' office network across all world regions and its "flows" that promotes cities to be nodes as well as links them together. Thus inter-city relations in the world city network can be measured according to measurements of global service networks of advanced producer service firm.

In fact, whether Friedmann's "world city hypothesis" or Sassen's "transnational urban systems", the essence are both reflection of relations between cities from city hierarchy perspective. Compared views of the world urban system represented by Friedmann to that

of world city network represented by Taylor, the former focuses on central place theory based on hierarchy perspective, in which cities' status depends upon on its attributes; while the latter focuses on central flow theory based on network perspective, in which cities as nodes formats and depends upon various "flows" flowing over, namely relational nature of cities. The two methods mentioned above reflect the turn of theoretical paradigm in the study of inter-city relations, that's from the hierarchy analysis paradigm of traditional central place theory to world city network research paradigm of "the new urbanism" that have been raised since 1990s under the background of economic globalization.

#### **4. City network and the source of urban competitiveness**

##### **4.1. inter-city relations in city network**

Based on inter-city relations assumed to be solely competitive in nature, urban hierarchy theory which has begun from the industrial society considers that hierarchies are not only the product of competition but also the power. The former presumption on inter-city relations begins to be questioned with the turn of hierarchy to network in city research paradigm. On the one hand, flows of capital and information between cities have come to be much convenience because of the development of information and communication technology. Mutual cooperative relations of cities become more and more generalization. The core controlling resource of the city development turn from the traditional concern of materials, capital, labor and so on, to be knowledge, information, services and innovation which play an important role in location strategies of producer service firms. Different from the

diminishing marginal returns of traditional resources, knowledge, concepts and innovation have the property of shareable and increasing marginal returns, which in some ways determines the need for attaching importance to communicate and share knowledge and formation with other cities. On the other hand, just as what the world city network theory proposes, the cooperative inter-city relations are constituted by the information, instruction, specialized knowledge, design, planning, strategy, ideas, teleconferencing, face-to-face meetings and other various forms that flow between city offices when implementing servicing projects for clients. In networks, members should not only concern the operation of themselves, but also all contribute to the wellbeing of the entire network, which are deferent from those members in hierarchies. Thus the nature of networks decides that it can only operate normally on the basis of mutuality amongst nodes, that is, mutuality property is the core of all networks. Just as Taylor [28] thinks, cooperation is the inherent inter-city relations in city network. Generally, Competitive relations between cities are derived from the hierarchy process of cities, while cooperative relations derived from the network process of cities. On way of thinking about the difference between city networks and city hierarchies is that the former focuses upon "horizontal" inter-city relations whereas the latter are dominated by "vertical" inter-city relations. And influenced by certain factors, including political over economic, gateway battles and cyclical effects etc, cities in city networks compete with each other contingently. From the perspective of city network, the development of city network is increasingly mature, and the importance of cooperative inter-city relations to city

development stands out greatly. At the same time, contingent factors influencing competitive city relations is ubiquitous in real world. For particular high-density urban area, such as urban agglomeration, megalopolis, the homogeneity of regions and the proximity of areas decides the more significant duality of the relationship existed among cities, which means the vertical hierarchy competitive relations and the horizontal network cooperative relations. Such cooperation relations are fundamental to motivating cities deriving sources of competition.

#### **4.2. The source of urban competitiveness from the perspective of city network**

Traditional urban competitiveness research, based on city hierarchical theory, takes the competitiveness of cities as endogenous from the perspective of single city which is dependent on cities' capacities of attracting, controlling and transforming resources. Focusing on the competitive inter-city relations, these researches endeavor in interpreting competitiveness by the attribute elements of internal city, while paying little attention to the influence of external factors such as global, national or regional environment. Even if these factors were taken into consideration, their functions are just limited to promote or stagnant cities to obtain competitiveness. There are increasingly important cooperative relations existed objectively among cities and it is important to promoting competitiveness of cities. Even though people have recognized it, for example, Begg[10] and Sassen [24] pointed out that the competition exists alongside cooperative relations. Ni Pengfei & Kresl [29] also suggested that economic competitiveness is not exactly obtained through absolute opposition, it is also available by exchange to

achieve win-win, this kind of cooperative relationship has been still ignored or even been excluded from the interpretation model to a great extent in the former research. As for the reason: on one hand, constrained by the theoretical research paradigm of traditional urban competitiveness, researches mainly focus on competitive relationship between cities, and tend to ignore their cooperative relations; On the other hand, integrating network and competition together is considered as a conundrum, for the reason that the former depends upon the reciprocity and cooperation between members, while the latter is based on bargaining market exchange[30]. It seems that the urban competitiveness have no intersection with the network cooperation. Actually, this mistakenly considers that the urban competitiveness is the same as competition relations between cities. The essence of urban competitiveness lies in the stronger capability of development and potential, with its ultimate goal of promoting urban residents' standard of living. It is no doubt that cooperative inter-city relations in network are beneficial to promoting competitiveness of both sides. Just for differences of single cities' size, scale, function, structure and stage of development,

results in the different degree of promotion effects which are generated from the cooperative relations operating during their competitiveness promotion process. In other words, simplex competitive relations are not the necessary and sufficient condition of urban competitiveness. Urban competitiveness is not a zero-sum game, which means that promotion of one city's competitiveness will not necessarily lead to the decline of another city's competitiveness. Therefore, from the perspective of city network, there exist two kinds of relations between cities, namely competitive inter-city relations and cooperative inter-city relations. The former generates the endogenous competitiveness of cities by emphasizing city's capacity of attracting, transforming and controlling resources; the latter generates the exogenous competitiveness of cities by emphasizing city's capacity of cooperation and nod advantages in network. The competition inter-city relations in view of city network determine that the source of urban competitiveness are derived from the organic integration of the endogenous and exogenous competitiveness of cities, different from the simplex source of traditional perspective(table 1).

	Traditional urban competitiveness researches	Urban competitiveness Researches in the perspective of city network
Theory of city relations	urban hierarchical theory	City network theory
Theoretical background	Industrial society	Post industrial society or information network society
Inter-city relations	Competitive relations	Competition relations
Core resources of cities	Tangible resources characterized by rareness and diminishing marginal returns	Knowledge, information, service and innovation characterized by expansibility and increasing marginal returns

Advantages of cities	Urban endogenous competitiveness: emphasizing on capacity of attracting, controlling and transforming resources	Urban exogenous competitiveness: network cooperation capacity and emphasizing on node advantages
Interpreting indicators of measurement	Attribute data of cities	Attribute and relational data of cities
Concept of urban spatial	Space of place	Space of flow
Patterns of city competition	Vertical hierarchy, unidirectional control, antagonistic competition	Horizontal network, bidirectional cooperation, contingent competition
sources of competitiveness	Urban endogenous competitiveness	Integration of endogenous and exogenous competitiveness of a city

Table 1: Comparison on Urban Competitiveness Researches from the Two Perspectives

### 5. Conceptual model of urban competitiveness based on city network

Based on the analysis above, this paper constructed a conception model of urban competitiveness with a city network perspective (figure 1). City is a node in urban network. The endogenous and exogenous competitiveness of a city and their germane effects codetermine the degree of the city's competitiveness. Among them, urban endogenous competitiveness belongs to

traditional research categories, which mainly comes from city internal assets and is determined by capacity of attracting, transforming and integrating resources, with an explanation basis of internal factors; while urban exogenous competitiveness, based on an explanation of city external assets produced by interactions and interconnections between cities, is determined by the crossing attributes of a city in the network and its externalities and node advantages as well.

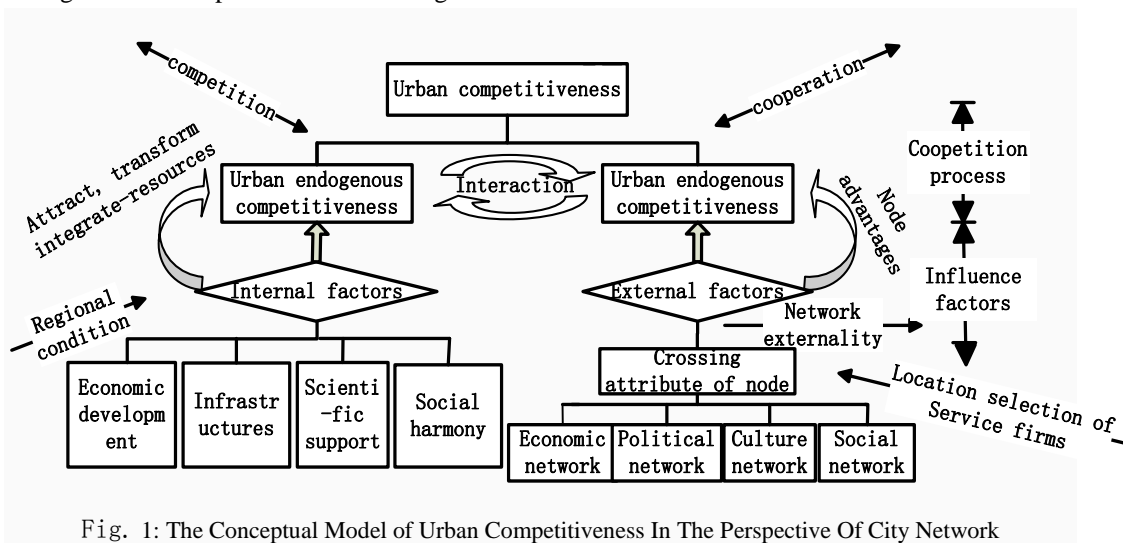


Fig. 1: The Conceptual Model of Urban Competitiveness In The Perspective Of City Network



City endogenous factors was characterized from four aspects, namely economy, facilities, technology and society, which respectively offering the following city information: size, structure and level of economic, insurance degree of city infrastructure, levels of science, technology, supporting environment, governance ,harmony, and development situation of the region as well, based on the double attributes of city as a wealth source and carrier of human living space with a focus on city's production attributes and livable purpose.

Enterprises, governments and resident individuals are behavioral subjects in cities, whose political, economic and social activities generate flows of people, flows of goods and flows of information which ultimately formulate city network of four types, including economic, political, cultural and social network. Among them, the economic network created by service enterprises in their location selections plays a leading role in city network. The node location and its effectiveness determine the scale of heterogeneous external assets the city obtained through externalities of city network. That is to say, the scale of external assets varies with the type and degree of how a city cooperates in the city network and affects the exogenous competitiveness of particular city in return.

Generally speaking, the endogenous competitiveness built mainly base on competitive inter-city relations, while the exogenous competitiveness built mainly based on cooperative inter-city relations. They constitute an integrated source of urban competitiveness together. But noteworthy, their contributions to urban competitiveness are different for cities with different types, size and stage of development.

As to particular cities, the endogenous and exogenous competitiveness of city is not mutual independence, but mutual interaction and promotion. They determined urban competitiveness together. It will be remarkably promoting the urban competitiveness, if we can put them in an integrated development strategic framework, deals the competition city relations scientifically to make them promotion each other harmoniously. For instance, due to advantages of significant accumulative effect and perfect infrastructure etc, cities of larger economic scales thus possessing stronger ability of gathering resources, are often prior chosen to be the office location by the headquarters of large-scale high-end producer service firms, so that their hinge position and node advantages establish and strengthen gradually step by step and the exogenous urban competitiveness is also promoted continuously. Furthermore, high-end producer service firms generally have the intensive property of capital, technology, management and knowledge, which is beneficial to improve the scale and structure of city internal assets as well as city's entire resource transforming and integration capability, and ultimately promote urban endogenous competitiveness. While the promotion of urban endogenous competitiveness will further improves city's status in city network, thus promoting its exogenous competitiveness in return. Through the foregoing process, the endogenous and exogenous competitiveness of city promotes each other mutually and formats a virtuous cycle. Of course, the realization of this ideal process are germane to the coordination and cooperation of elements such as infrastructure, supporting conditions of science and

technology, governance level and social harmonious degree.

Conversely, if we separate relations between urban endogenous and exogenous competitiveness, just emphasizing one of them and making them unable to promote and converse mutually, it will probably constrain the promotion efficiency of urban competitiveness, and even cause relative falling of urban competitiveness. Just as administrative economy which has been discussed a lot by scholars is a typical phenomenon that overemphasize on the endogenous competitiveness power, but neglect that of exogenous competitiveness. And in reality, there are many examples that emphasize cooperative development in various coordinated development planning of urban agglomeration and construction of economic cooperation zone but with bad actual effects. Explanations often attribute the problem to the lack of substantial progress on cooperative relations caused by administrative barriers and market segmentation. In fact, this is only a superficial appearance. The reason behind probably lie in the insufficiency of competition between cooperative mainstays. That is to say, just emphasizing cooperation but ignoring competition to achieve expected effect is only a wishful dream.

Competition and cooperation is essentially the contrary unification. From the perspective of competition, the competitive and cooperative inter-city relation provides power together during the process of deriving competitiveness, and respectively determines the endogenous and exogenous competitiveness. And that urban competitiveness is ultimately depends upon urban endogenous and exogenous

competitiveness and their germane effects. We can express it in the following functional form:

$$UC=G \{f_1 (E_n), f_2 (E_x), f_3 (E_{nx})\}$$

$UC$  represents urban competitiveness;  $f_1$  represents urban endogenous competitiveness;  $f_2$  represents urban exogenous competitiveness;  $f_3$  represents germane effects of  $f_1$  and  $f_2$ ;  $E_n$  represents the endogenous factor matrix of city;  $E_x$  represents the exogenous factor matrix of city;  $E_{nx}$  represents the germane matrix of city's endogenous and exogenous factors.

## 6. Conclusions

Based on view of city hierarchy and competition, tradition urban competitiveness research focuses on the internal aspect of single city and their competitive relations. Although it has been relatively matured, the ignorance of co-operation external relations that are objectively existed between cities as well as its importance to obtain competitiveness determines that it is hard to make a scientific and comprehensive analysis and explanation on urban competitiveness, which leads to the theoretical studies usually inconsistent with the urban development practices. Drawing on the theoretical research paradigm of city network built by "the new urbanism", this paper deconstructs sources of urban competitiveness from the perspective of competition inter-city relations, and based on the scientific connotation of traditional urban competitiveness studies, constructs the conceptual model of urban competitiveness constituted by reciprocity of endogenous and exogenous competitiveness with integrating some conceptions as city network externalities and nod advantages into the analysis frame, thus break through one-sidedness of explaining urban competitiveness just from

competition perspective, reveals the importance function of urban endogenous and exogenous competitiveness as well as their germane effects for cities to obtain competitiveness To further improve, provides a new research approach and analysis frame for further improving analysis on sources of urban competitiveness and scientific explanation of measuring results. The following aspects need to be studied further in the futher: (1) empirical research about urban competitiveness measurement based on city network; (2) the germane effect of urban endogenous and exogenous competitiveness; (3) establishing an indicator system of the exogenous urban competitiveness and making further research; (4) obtaining and mining inter-city relational data based on city network. In conclusion, the theoretical frame and quantitative research methods of "the new urbanism" have provided a new analyzing perspective for city competitive research. The analysis framework of urban competitiveness in view of city network also applies to create the coordinated development planning for all kinds of urban agglomerations which are experiencing more prominent competition inter-city relations and evolution at present in china, and researches of promoting single city's competitiveness as well. Analyzing urban competitiveness from the city network perspective is not only the need to revealing the intrinsic qualities of city itself, but also the need to adapt to the present development stage of urbanization in China.

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