

**WORLD CITY DEVELOPMENT IN CHINA: A
MULTIFACETED APPRAISAL OF CHINESE
CITIES IN THE ERA OF GLOBALIZATION**

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**WORLD CITY DEVELOPMENT IN CHINA: A
MULTIFACETED APPRAISAL OF CHINESE
CITIES IN THE ERA OF GLOBALIZATION**

by

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LIST OF ABBREVIATIONS

APS	Advanced Producer Services
AVE	Average Variance Extracted (AVE)
CBD	Central Business District
CR	Composite Reliability
CCI	Control and Command Index
FDI	Foreign Direct Investment
FINDEX	Financial Center Index
GaWC	Globalization and world city research network
GDP	Gross Domestic Product
GDS	Global Distribution System
GICS	Global Industry Classification Standard
GRP	Gross Regional Product
ICAO	International Civil Aviation Organization
IFC	International Financial Center
MNCs	Multinational companies
NIDL	New International Division of Labor
PPP	Purchasing Power Parity
PLS-SEM	Partial Least Square-Structural Equation Modeling

SNA	Social Network Analysis
SPSS	Statistical Package for the Social Sciences
WCN	World City Network
WTO	World Trade Organization

**PEMBANGUNAN BANDARAYA GLOBAL DI CHINA: SUATU
PENILAIAN PELBAGAI KE ATAS BANDARAYA CHINA DALAM ERA
GLOBALISASI**

ABSTRAK

Perkembangan globalisasi dan penyebaran maklumat yang pesat telah berlaku sejak bermulanya abad ke 21. Ekonomi China merupakan rangsangan utama yang mempengaruhi struktur hierarki dan sistem rangkaian bandar-bandar dunia. Tiga objektif dikenal pasti dalam kajian ini iaitu: 1) Untuk mengkaji hubungkait antara faktor tarikan asas, strategi lokasi, dan pembentukan bandaraya dunia dengan merujuk kepada kes Shanghai; 2) Untuk meneroka struktur hierarki bandar pusat kewangan nasional dan bandaraya dunia di China; dan 3) Untuk bandar mengukur hubungan regional antara bandar-bandar di China yang terkandung di dalam rangkaian bandaraya dunia. Analisis Rangkaian Social (SNA) mempunyai pelbagai pendekatan untuk meneroka status umum pembangunan bandaraya dunia termasuk Partial Least Square Structural Equation Modelling (PLS-SEM), analisis regresi berganda, analisis kandungan, SPSS dan analisis faktor, model rangkaian bandar berkait, dan UCINET. Kajian kes Shanghai ini menggunakan analisis rangkaian hierarki bandar nasional di bandar-bandar China. Kajian ini membincangkan pembangunan bandaraya dunia di China berdasarkan hipotesis bandaraya dunia, konsep pembahagian buruh antarabangsa, perkhidmatan pengeluaran termaju, teori lokasi, teori aglomerasi ekonomi, dan yang paling utama teori rangkaian bandaraya dunia. Ketiga-tiga penemuan kajian membuktikan satu rangka tindakan baru bagi pembentukan bandaraya dunia di China dalam era globalisasi ini. Berhubung dengan

kajian kes yang berkaitan dengan bandaraya dunia yang terkenal di China iaitu Shanghai, dua parameter didapati telah mempengaruhi pembentukan bandaraya dunia iaitu pembangunan pusat kewangan dan aglomerasi MNC. Di samping itu, bandar Beijing, Shanghai, Chongqing, Shenzhen, dan Guangzhou dinilai sebagai berkedudukan tertinggi dan skor menyeluruh dalam analisis komponen utama. Penemuan ketiga kajian ini menunjukkan corak rangkaian pengangkutan udara China dan rangkaian perkhidmatan pengeluaran termaju. Keterbatasan kajian ini berkaitan dengan metodologi dan ketersediaan data. Adalah disyorkan bahawa penyelidikan masa hadapan mengenai topik ini memberi tumpuan kepada kajian wilayah bandaraya dunia dan menggunakan analisis ruangan untuk meningkatkan aplikasi teoritikal dan praktikal penyelidikan bandaraya dunia.

**WORLD CITY DEVELOPMENT IN CHINA: A MULTIFACETED
APPRAISAL OF CHINESE CITIES IN THE ERA OF GLOBALIZATION**

ABSTRACT

A rapid expansion of globalization and diffusion of information has occurred since the beginning of the 21st century. The Chinese economy is a major stimulus that affects the hierarchical structure and system of the world cities network. Three objectives are identified in this research: 1) To examine the overall relationship between the underlying driving forces, locational strategies, and world city formation in the case of Shanghai; 2) To explore the national urban hierarchical structure of financial centres and world cities in China; 3) To measure subregional intercity connections of Chinese cities embedded in the world city network. Social Network Analysis (SNA) has a multifaceted approach to exploring the general status of world city development including Partial Least Square Structural Equation Modelling (PLS-SEM), multiple regression analysis, content analysis, SPSS and factor analysis, the interlocking city network model, and UCINET. This case study of Shanghai uses network analysis of the national urban hierarchy world city network of Chinese cities. This research discusses world city development in China based on the world city hypothesis, the concept of the international division of labour, advance producer services, location theory, agglomeration economy, and, most notably, the theory of the world city network. The three findings of this study evidence a new blueprint of world city formation of Chinese cities in the era of globalization. In relation to case studies pertaining to a preeminent world city in China, that is, Shanghai, two parameters were found to affect world city formation. These parameters are the

development of the financial centre and MNCs agglomeration. In addition, Beijing, Shanghai, Chongqing, Shenzhen, and Guangzhou were evaluated as having the highest rankings and comprehensive scores in the principle component analysis. The finding of this research demonstrates the network pattern of the Chinese air transport networks and the advanced producer services network. The limitations of this research relate to research methodology and the availability of data. It is recommended that future research on this topic focuses on world city-region study and utilizes spatial analysis to enhance the theoretical and practical applications of world city research.

CHAPTER 1 INTRODUCTION

1.1 Study Background

After the twentieth century, the rapid proliferation of geographical globalization and urbanization led to the formation of world cities and an explosion of interconnection at a staggering rate. The innovation of information technology and agglomeration of multinational companies (MNCs) have brought about global capital flow, labour and information. In this era of transnational circumstances, world cities interfaced with globalization trends have become one of the notable themes for research. Indeed, many scholars have contributed to this notion; they tend to be engaged in the world city network investigation, particularly interlocking node connections of world cities and advanced producer services firms (Beaverstock, Smith, & Taylor, 1999; Derudder, Taylor, Witlox, & Catalano, 2003; Taylor, Catalano, & Walker, 2002), and global space of air passengers traffic (Derudder & Witlox, 2005; Mahutga, Ma, Smith, & Timberlake, 2010; Smith & Timberlake, 2001). On the other hand, other researchers seek to delve into another stream of world cities, notably into the sphere of hierarchical specification and territorial attributes analysis (Brenner, 1998; Ng & Hills, 2003; Robinson, 2011).

As globalization becomes the major trend in a contemporary world economy, it is crucial in the accelerating in the formation of world cities (Lo & Yeung, 1998). Specifically, this encompasses economic, social and cultural globalization. Many scholars have paid more attention to the economic globalization within global studies. As globalization is closely associated to economic geography and urban studies, it is thus a dominant endogenous mechanism for a global city, along with serving as a

financial centre for development. Since the producer service industries develop at an unprecedented speed within circumstantial globalization, the financial sector dominates in particular and has become a leader in the producer services sector. Thus, we should be able to find the intrinsic characteristics and driving forces of world city formations by following these processes. Globalization, widespread information technology innovation, and multinational companies' expansion in this informational society enables the flow of information, capital and labours, thereby enhancing social network and transcending spatial economy (Castells, 2011). More importantly, these spaces of flow can accelerate the spatial decentralization of economic activities, and this kind of spatial dispersal can be identified as the centripetal forces that trigger the world city formation. Currently, Asian cities play a dominant role in the global economy, as Asian urban population account for a large portion of the global population; the new urban knowledge production has transferred from Western Europe and North American to Asian region (Bunnell et al., 2012). Asian urbanism and the global privatization of urban spaces is thus the premier frontier of urban development of Asia counties (Hogan et al., 2012), China is one of the populated Asia countries, and according to conventional western theorizing of "non-western" cities as being different from the western, has own unique characteristics of an urban model. Thus, the exceptionalism of Chinese cities enables a more comprehensive discussion of Chinese cities in the era of globalization (Pow, 2012).

After the 1980s, China initiated an open door policy, enabling its economy to be embedded in the global economic landscape and further foster its growth at a tremendous pace (Ma, 2002). Indeed, this was generally believed that this breakthrough was attributed to Chinese government open door policy and the

restructuring of industrial structure and production bases, such as tertiary industrial development (also called services industry). Meanwhile, foreign direct investment (FDI) of multinational companies and international exports and imports make a dramatic implication for the Chinese economic achievement. However, it has to be noted that the globalization process and diffusion, as well as world cities transformation, is another determinant that triggered China's economic development. Shanghai and Beijing act as the leading nodes of urban hierarchy, as they possess the most advanced infrastructure and communication system, the highest standard of transportation networks, and massive financial market, along with other producer services industries (Wu, 2000). In short, the exploration of China world city development, especially vanguard cities of eastern coastal regions, as well as the world city network formation of Chinese cities, still had numerous underlying aspects that needed further research.

The rise of China economy in contemporary globalization had underpinned the world cities within it in the world's economy. In the spatial map of distribution of sources, capital, labour, and information, it is evident that there is a clear tendency towards an uneven distribution of urban development. This disproportionate of urban development has formulated a new structure of urban hierarchy, with the eastern region of China is mainly characterized by a higher order urban hierarchy, whereas western and middle regions of China are considered to have relatively lower level of urban hierarchy. This new urban hierarchy reveals the economic globalization and urban transformation in China, and can be attributed to the fast economic development of east region of China. Furthermore, another factor for the region's rapid ascent is in its tendency to possess location advantages, which is capitalized with professional and high skilled labour markets, along with convenient

transportation and information system. Under the preferential policy and local institution guidance, the western and middle regions of China acquired large support from the central government and regional community, due to their insufficient capital resources and industry base. The lack of an intrinsic competitive advantage of western and middle China is compensated through a series of information and transportation development strategies, thus reducing the gap between east and west territories. Although this region is considered to have some natural restrictions due to its geographical location and scarcity of information, these vast quantities of natural resources have enabled it to become the mecca for resource oriented industries. Furthermore, the huge territory of land resources in untouched regions has further potential to be exploited. Hence, the western region development strategy proposed by the Chinese central government is aimed at enhancing the urban-rural development, resources development, as well as industrial construction. This strategy has dramatic implications on regional development of provinces in the western part of China. Indeed, for this situation, the Chinese urban landscape is restructuring in line with the development of western and middle regions of China. Consequently, there are many world cities forming in this new urban hierarchy, and would thus cover the whole Chinese territory scoping from east to west regions. In the new globalization agenda, a study of Chinese world city development, which is built upon the foundation of urban linkage and regional development, had induced intensive debates on a national and global scale.

The thesis is thus aimed to identify the world city development of Chinese cities against the backdrop of globalization, from the views of international financial centre development and MNCs agglomeration. As such, a multifaceted research method is conducted to clarify the research objectives of this study.

Chinese cities in the global urban hierarchy

With the expansion of globalization and world urbanization, Chinese cities have integrated into a broad world city network that is found in this era of globalization. These cities are entailed in a new form of urban competitiveness that is associated with high economic dominance, social integrations, as well as environmental and regional sustainability. Meanwhile, it is clear that advanced producer services industry had underpinned the Chinese national and regional economy within contemporary society. The Chinese government thus actively encourages direct foreign investment from multinational companies, thereby highlighting the role of Chinese cities in globalization circumstances. In order to accommodate the urban development of China in this unprecedented transformation, we need to highlight and understand the current achievement of Chinese cities, particularly through the systematic assessment of a handful of world cities in a national territory. This would be vital in measuring and comparing the urban system in Chinese cities with other foreign cities.

1.2 Problem statement

Based on previous studies, some significant research problems have been clarified within this section for further discussion. One of the obvious research problems is attributed to its range of research. A majority of previous scholars have focused on the global urban system, which means that they only elaborate the analysis of whole world inter-city connections instead of a specific study of the inter-city connections of regional dimension. Specifically, since there is an uneven economic development on global scale and world city clusters in Western Europe, North America arena, as

well as some dominant Asian cities, a majority of scholars tends to focus on the whole global connections in the context of the world as a whole. The study of sub-network of world city connections among the Asian area, particularly those that showcases a research focused on the insights of China, is still lacking.

In this regard, Chinese world cities are not specifically considered in previous studies. In terms of seminal work on world cities, Friedmann (1986, 1995) spent more intuitive studies in the rating of large world cities on the basis of attributes and less on a systematic interpretation of information regarding how they are regionally and globally linked. In his world city hierarchy, there are no newly emerged mainland Chinese cities included within the global arena, with the exception of Hong Kong. In order to rectify this problem, China will be focused on as the study area in this research, in order to construct a sub-regional world city network of Chinese cities, one that is based on the data from China air transportation network and advanced producer services network. Since China is experiencing unprecedented economic transformations and infrastructure restructuring in this contemporary era, it is increasingly being integrated into the world city network. Likewise, globalization, urbanization, and foreign direct investment (FDI) have become another three indispensable driving forces that enable the research of world city network of Chinese cities (Zhao & Zhang, 2007).

In addition to the first research problem, the second problem is associated with the world city study of Chinese cities, as previous studies tend to focus on the functional characteristics of Chinese world cities by using a hierarchical approach and comparative analysis (Zhao, 2004 ; Wang, 2007). The major cities mentioned in previous research including Beijing, Shanghai, Guangzhou, and Shenzhen. Thus, a major limitation is associated with the shortage of relational data regarding world

city research (Short et al., 1996; Taylor, 1997). In order to rectify these problems, many scholars have attempted to initiate a new method for the discovery of relational data regarding world city research. The most obvious achievements are composed of two streams. The first stream is drawn from the infrastructure network of world cities, where some scholars focused on the air transportation network (Derudder & Witlox, 2008; Ma & Timberlake, 2008; Smith & Timberlake, 1995) while the second stream involves Internet-backed networks (Moss & Townsend, 2000; Townsend, 2001; Vinciguerra, Frenken, & Valente, 2010). In addition to the first stream, advanced producer services network tend to be closely connected to globalization and world city research network (GaWC) study (Derudder et al., 2010; Derudder, Taylor, Witlox, & Catalano, 2003; Taylor, Catalano, & Walker, 2002).

In the same vein, previous scholars in China also measured intra-city attributes based on the explicit case study of single cities or massive comparative study of other cities. This pervasive study method is based on attributed data that clearly embodies robust vulnerabilities. The first disadvantage is that this method cannot uncover inter-city connection of Chinese cities embedded in the world city network. The second disadvantage with this this method is that it is only restricted to the cities order rankings, with regard to their intrinsic functional characteristics, and thus cannot demonstrate the cities' connectivity, centrality and dominance of the whole network. More importantly, the structure of the world city hierarchy is not credible when indicated in this regard. In order to rectify this problem, the world city network of Chinese cities are depicted based on the relational data, and therefore will identify the major inter-city relationships in China that are incorporated into the world system. Shanghai is the dominant hierarchical articulation of a world city in China, and thus plays a dominant role for scholars on world cities study. In this

research, the dominance and position of Shanghai embedded in the world city network as a case study will be considered as well.

Based on the previous studies of world city formation in China, the third research problem will look at the stream of research problem associated with research methodology. Accordingly, previous scholars tend to utilize descriptive studies, case studies, comparative studies, and some other qualitative methods to discover the driving forces and distinctive characteristics of world city formations in China. These methods are hampered by apparent weaknesses, which impede it from identifying the concrete intrinsic function of the world city formations in China. In this research, a quantitative method and network analysis will be employed to elaborate on a more holistic analysis of a world city formation in China. Due to the combination of several research methods, the micro and macro perspectives of the world city formation in China can further be synthesized. In other words, this will signify intrinsic developments of industries in Shanghai, from micro characteristics and urban network within the entirety of China can be found simultaneously due to the macro characteristics. This rigorous method can thus be used to cope with the research problem, in terms of the finding the internal relationship between city research and industry research.

The reason for conducting this research is with the aim of rectifying the previous research problems. The major issues are related to the lack of clarification of Chinese cities in the era of globalization, while another issue lies in terms of identify between the internal connections and urban hierarchy of Chinese cities. Most importantly, as Chinese world cities tend to have the power to attract foreign investment, the enlargement of foreign investment has enhanced normal Chinese cities to be transformed into higher levels of a world city. The research questions are

thus closed related to these research problems. It is important to solve the issues of this study, as this would allow us to identify the driving forces that affect world city formation, location strategy and agglomeration implication of MNCs, as well as a national urban hierarchy and world city network of the Chinese cities.

1.3 Research questions

The project will embark based on the following research questions:

- 1) What are the driving forces that influence the world city formation in the case of Shanghai?
- 2) What are the location strategies for local financial firms and spatial agglomeration patterns of multinational companies in Shanghai?
- 3) What are the national hierarchical structures of financial centres and world cities in China in the globalization context?
- 4) How is the Chinese cities sub-regional inter-city relationship embedded in world city network?

1.4 Research objectives

The objectives of this project are to explore the following:

- 1) To examine the overall relationship between the underlying driving forces, locational strategies, and the world cities formation in the case of Shanghai.
- 2) To explore the national urban hierarchical structure of financial centres and world cities in China.

- 3) To measure the sub-regional inter-city connections of Chinese cities embedded in the world city network.

1.5 Significance of this research

1.5.1 Theoretical contribution

This research plays a dominant role in enhancing the contemporary study of the world city theory and world city network theory.

First of all, the premise of this existing literature and pioneering study of the world city is based on the scenario in developed western countries, which triggers some insufficient vision pertaining to emerging Asian countries. Clearly, the theories of multinational companies' agglomeration, international division of labour, and world city development derived from developing countries' big cities are compensated by this research through a spatial vision transformation of these Asian countries.

Secondly, previous studies have a tendency to focus on a single world city study with reference to the internal characteristics of industrial development and urban structure from a more micro economical perspective, while some other studies underwent the discovery process to enlarge the knowledge of the world city network theory from the macro-economic perspective. The discourse of how to balance these two theoretical streams will be investigated at length in this study. Specifically, this research contributes to the identification of a possible linkage between the world city theory and world city network theory, rendering a theory that illustrates a combination between the micro and macro perspectives.

Lastly, due to the overwhelming concentration of MNCs in some world cities in China, this research will take advantage of the spatial analysis of cluster trends and location strategy of MNCs in the case of Shanghai, which significantly transcends ~~ed~~ the urban agglomeration theory that is applied in the world city study.

1.5.2 Practical contribution

Since the majority of previous studies departed from theory-based research, the shortage of quantitative data renders an insufficient amount of consideration and application of the world city theory in practical reality. In practice, this research deployed the quantitative questionnaire approach and network analysis, which is then used to consolidate the scientific aspect of the research. Most importantly, it is to be noted that while the Chinese government has taken some progressive policies and implemented a world city strategy in Shanghai, along with some other metropolitan cities, these policies still exist with some shortages, particularly on their practical aspect. In this research, the synthesized approach of both the quantitative and qualitative study is clearly setting up a new blueprint for the world city research in China. For example, this synthesized study will be comprised of the combination between an interview and questionnaire, as well as statistical and big data analytical process.

Furthermore, as a result of Shanghai's urban spatial restructuring strategy, the infrastructure and information system has undergone a dramatic transformation in recent years. When taken together the promotional strategy, which attracts the FDI, as well as the MNCs to Shanghai, the development prospect of Shanghai's world city strategy is increasingly appealing.

Lastly, due to the fact that the inter-city connections are rather intense, the status of Chinese cities embedded within the sub-regional world city hierarchy is no longer isolated, as Chinese government seeks to improve the cooperation amongst articulations integrated with the world city network. With regards to the aforementioned urban reform planning and policy initiatives, some Chinese world cities should be taken into account as holding a preeminent position for the development as a networked city embedded in the world city network.

The detailed study of world city formations in China has some benefits that allow for a practical contribution for this region. In contrast to the previous theory contribution, the main contributions are attributed to the MNCs clustering study, world city network research, as well as some parameters classifications. In general, all of studies above are operationalized towards the regional policy maker and central government. Indeed, they will be able apply the empirical finding and theoretical contribution of this research to initiate regional development and urban restructuring policies for Chinese cities in the future.

1.6 Scope of this study

In terms of this research, it will concentrate on the concept of the “world city” and investigate the formation of the world city in China. This project is an interdisciplinary study, which is built on the knowledge of urban geography, economic geography, and sociology statistical analysis. The research was built on the urban development and economic globalization, in particular; this refers to the conspicuous implications of agglomeration and linkage patterns on urban development of Chinese cities. A multi-scale analytical method is implemented to

assess the world city development and a social network analysis (SNA), along with an econometric statistical analysis was employed to investigate the space flows and interactions between capital, resources, and human factors. In addition, how this paradigm of flows affected inter-city connections will be looked at. The main theory of the world city network, as proposed by GaWC, is discussed in this research through dual lenses based on a micro and macro view. This research focuses on the scenario of China, as it is one of the countries with the fastest economic growth due to the effect of globalization. Thus, this research will assess the urban development, and in particular, its world city formation.

1.7 Thesis Organization

This thesis constitutes of seven chapters. Chapter 1 will encompass the research background, problem statement, research questions, research objectives, and study scope, along with the study significance. This chapter will thus be the cornerstone of the whole thesis.

Chapter 2 will be a literature review of previous theoretical and empirical research pertaining to the world city theory. The research gap is identified in this chapter in order to further consolidate the thesis research. In addition, a theoretical framework is configured based on the world city, world city network, location theory, as well as the agglomeration theory. Indeed, an organized conceptual framework is viewed as a fundamental part of subsequent methodology design and data analysis.

Chapter 3 will then further elaborate the research design and methodology, and will encompass the study area (the study area will focus on Shanghai as a specific

case firstly, and the rest of the Chinese cities in a general focus), data sources, data collection, and data analysis.

Chapter 4 is on the case study of the world city development in Shanghai. The quantitative data was analysed based on a questionnaire survey on local respondents, and the PLS-SEM was applied through the use SmartPLS to find the possible linkage between major driving forces and world city development. Generally, this part would be considered a fundamental chapter for subsequent micro and macro researches, with regards to the general status of world city developments in Shanghai.

In addition, this part will discuss the internal structure of Shanghai with reference to its industrial development trajectory. Furthermore, in this chapter, the intrinsic relationship between industrial development and world city development is explored. In the first section in particular, some semi-structured interviews were conducted with the manager and senior staff of local financial firms to identify the development trajectory and location strategy of these firms embedded in these globalization circumstance. By using the location theory, the status of Shanghai as a financial centre can be clearly identified. To complement the first section, the second section's analysis of spatial agglomeration patterns of multinational companies' headquarters within the Shanghai CBD area was according to the interview performed with local government staff and regional planner, and this comprehensive analysis can thoroughly identify the pre-eminent world city status of Shanghai.

Chapter 5 focuses on the comparative study of national urban hierarchy of financial centres and world cities in China. This comprehensive study could then be used to identify the hierarchy level of Chinese urban development and the most competitive cities in this hierarchy.

Chapter 6 applies network analysis to the world city formation in China, which is the inter-city relationship instead of the case study. This chapter provides a framework to present the sub-regional inter-city connections of Chinese cities embedded in the world city network. Regarding the implication of globalization circumstances, the major metropolitan cities are no longer isolated within Chinese territories. In order to find the linkage effect of Chinese cities, transportation network models and interlocking network models were applied to explore the empirical finding within this aspect.

Chapter 7 is the concluding chapter, and detects the finding and implication of the thesis. This thesis contributes to the world city planning for the Chinese government, as well as some recommendations for future researches on geography, economy and planning scholarships. However, it is to be noted that some limitations are still bound to exist, due to the time constraint and data deficiency.

CHAPTER 2 LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Introduction

This chapter reviews a series of literature in terms of the previous theory, applied models, and empirical findings of the world city research. It will begin with a discussion about the definition of world city, as well as its distinctions and similarities with the global city and mega city. Then, this will be followed by a review of the different approaches and trajectories of world city study. This critical examination of different approaches and the theory of previous world city studies is a fundamental cornerstone for the subsequent chapter on methodology. The third part will then investigate the literature regarding the world city formation in China and its preeminent world city, Shanghai, within the world economy. Lastly, the theoretical framework of this thesis is constructed in order to investigate the world city network of Chinese cities.

2.2 World city definition, its distinctions and similarities with the global city and mega city

The term ‘world city’ can be utilized to explain the global function and supervisory-control power of a world economy, as well as inter-city network between cities, while a mega city, in contrast, is used to explain the population threshold and demographic characteristics of big cities.

Indeed, there are certain distinctions between world cities, global cities and mega cities. In general, due to population threshold and scale of size, mega cities tend to

refer to cities with a population of over 8 million. The size scale, and in particular, its population characteristics, is the most dominant criterion in evaluation as to whether the city can be classified as a mega city. A mega city can also be a single metropolitan area or comprising of two or more metropolitan areas that converge (Douglass, 2000). Metropolises are major trends of the 21st century (Roy, A. 2013). The most specific examples of mega cities in the world include Tokyo, with a population of around 38 million, Shanghai, with a population of 34 million, as well as Jakarta, with a population of around 31 million. As of 2017, China alone has 15 mega cities, demonstrating that China had become a country that has experienced a dramatic amount of urbanization and population expansion in the contemporary age. Based on a comprehensive study of world cities and mega cities, Tokyo and Shanghai are considered as premier mega cities as well as global cities. However, Jakarta is only perceived as a mega city to a certain extent (Sassen, 2000 ; Douglass, 2000).

With dramatic economic development and fascinating social restructuring, preeminent mega cities in the world have been eroded by information transmission and technology development, a phenomenon that has affected its productive performance in particular. The global city has replaced the position of mega city in control of this global information hub. For example, these include Asian mega cities such as Hong Kong, Shanghai (world city and mega city) and Tokyo. These cities make great contributions to the local urban population, and they account for a large proportion of world's population as well. As global mobility and urban transitions expand, globalization can be viewed to be a procedure that leads to a restructuring of the urban development of these mega cities, with new elements being substantially integrated into these urban regions. Some newly developing industrial countries that

are in line with the international division of labour, are viewed to be creating a new economic development of their mega cities (Douglass, 2000). These countries include China, Malaysia, and Indonesia and Thailand, all of which are in Asian region.

In contrast to the mega city, global cities have a uniqueness and complex definition to identify a form of urban identity. In the book “The Global City: New York, London, Tokyo” (Sassen, 1991), it refers to a form of economic hubs that concentrates on the functionality of the city. Meanwhile, it has sought to explain the global space of flows in economic activities based on the connection between these articulated urban conglomerates. Urban conglomerates refer to a group of cities agglomerating in a region. By contrast, a world city is originally derived from an idea by Patrick Geddes from a publication in 1915 (Geddes, 1915), which was considered to be a global strategic location in some senses. Specifically, this definition is applied more on the explanation of geography characteristics rather than economic characteristics. Furthermore, it should be noted that world cities have a chronological influence on both past century and current periods, and these cities tend to influence on several centuries, such as some old cities of London, Paris and Shanghai.

However, these concepts regarding the world city and global city are overlapping to some extent and have been found to share the same explanation in some articles (Sassen, 2016; Knox & Taylor 1995). Until now, it was the general consensus that a world city could be identical to a global city. However, a global city is not a world city, when a full analysis of this concept is taken into account. The following section looks to justify and compare the relationship between these concepts.

The detailed explanation between a world city, a global city and a mega city are as follows:

A world city tends to be perceived as a control and command centre to coordinate the global economy. (Smith, 2014). In the globalization era, many scholars have initiated certain approaches to describe the general configuration of a world city. Not surprisingly, the contemporary world city study is derived from several premier researchers from the Globalization and World Cities Research Network (GaWC), which is a leading research network that aims to identify the external relations of world cities in globalization, premised on the concerns for inter-city connections (Derudder, 2003). As such, the world city is an integral part of the world system. Generally, this conspicuous concept demonstrates a control and command centre that is a response to unprecedented globalization circumstances. Similarly, fundamental distinctions between world city and mega city have sparked many debates in previous research periods (Taylor, 2002, Derudder, 2005). While there are a wide range of overlaps between the two terminologies, a mega city is clearly qualified with its population threshold and demographic composition, whereas in the case of a world city, it is considered to have economic, social-cultural, as well as political core articulations embedded in the context of globalization. In other words, the study of mega cities is closely associated with demographic tradition of population agglomeration and a world city tends to be related to the functional tradition of dominant cities that are incorporated into the global system. The early study of world cities was aimed at understanding its world capacity in terms of power and diversity of the global economy (Taylor et al., 2002). The global presence of advanced producer services, in accordance with their respective cities, is thus the priority of an empirical approach in illustrating the world city-ness of these dominant

metropolises. This empirical study thus strives to consolidate the pervasive features of world city formations in the contemporary era, including metropolises such as New York, Tokyo, Hong Kong and Singapore.

Despite this, many researchers have engaged in systematic distinguishing between the general discrete characteristics of world city and mega city. Indeed, there are still insufficient considerations between global city and world city. Hence, in this chapter, these two concepts, with reference to their corresponding distinctions and similarities, will be focused on. With regards to the definition of the first tier of the world city concept, the seminal study of John Friedmann (Friedmann, 1982), in his article of world city hypothesis, cited this. He initiated seven significant proposals of a world city development, predicting the generalization insight and notion of world city formations with reference to the spatial perspective of international division of labour. These seven hypotheses encompassed : (i) Functional feature of the new international division of labour integrated into world economy; (ii) Global capital as basing points to formalize a comprehensive spatial hierarchy; (iii) Global control function with reference to its dynamic production sectors and employment; (iv) Convergence of international capital; (v) Destinations of international and domestic immigrants; (vi) Spatial and class polarization of industrial capitalism; and (vii) Social cost which exceeds the fiscal capacity of the nation state. Based on this study by John Friedmann (1982), several scholars have proposed some other perceptions which demonstrated the implications of world city that penetrated into the world economy. Friedmann and Wolff (1982) clarified that a world city was the control and command centre which coordinated the international division of labour, in line with the robust development of multinational companies. The premise of world city is thus ascribed to several parameters. For instance, the

network configuration is cumulatively integrated after the 21st century, and this formal network analysis is derived from the concept of spaces of flows within the contemporary global economy (Castells, 1996). Not surprisingly, based on the advancement of information and communication technology, network society has replaced the previous case study and functional analysis of isolated world city in the globalization trend. The inter-city connection has largely thus relied on relational data of hierarchical analysis, although the shortage of this essential data had impeded the progress of network configurations for the world city study (Beaverstock, Smith & Taylor, 2000). A new research group entitled with GaWC has propagated a new form of interlocking city network models that demonstrate how a global network of cities with reference to the seamless office linkage of global producer services firms could be precisely specified. The creation of a new relational matrix, based on a wide range of collected data, have been ranked as the general urban hierarchy of world cities, along with its dominance and position within in the world city network with regards to the index of global network connectivity. Following a pilot study of the specification and measurements of the world city network, a wide spectrum of articles were generated by the GaWC research group, based on the application of inter-locking network model. Their research had a tendency to focus on the quantitative analysis of world city formation. Indeed, the specification of a world city network was generally deemed as the most explicit analysis of inter-city connection of world cities. Thus, this quantitative systematic analysis of contemporary international urban network can be found to be underpinned by three layers of hierarchical structure, namely cities, advanced producers services, and the world economy, which demonstrates the nodes, sub-nodes and supra-nodes levels of the world city hierarchy (Brenner, 1998). In addition to the aforementioned rigorous

approach of interlocking city network model, a second stream of infrastructure network analysis world city network was greatly discussed at a similar time (Smith, & Timberlake, 2001). The world city network study, accompanied by the compilation of transportation network, was divided into two parts. According to the article classification (Choi, J. H., Barnett, G. A., & CHON, B. S. 2006), taxonomy of the transportation network was mainly made up by the transportation network research, and based on the spatial air traffic data and Internet network research based on the Internet backbone data.

In contrast to the first illustration of the world city's concept of globalization study, the second term is related to the global city concept. As there already exist some similarity between these two concepts, the differentiation between these concepts and the world city has become one of the empirical conundrums of urban study. The concept of a global city was proposed by Saskia Sassen (Sassen, 1991), who is a pioneering scholar involved in the study of urban formation and globalization. The global city in the world economy is conceptualized based on the agglomeration of advanced producer services in the pioneering metropolitans of New York, London and Tokyo, and is the major paradigms of research since these three global cities had a tendency to have a prestigious international reputations of financial innovation and service industry concentration. On the other hand, the global city is the frontier zone of world's economy, and it tends to be perceived as a complex constitution of transnational economy. The prominence of global cities has been captured in qualitative studies, which demonstrates that it is slightly distinct from the common definition of a world city. This qualitative approach is emphasized by the study of Robinson (Robinson, 2011). She discussed the analytical process method used in for the global city study. This qualitative method used by Robinson

focuses on the interview with premier authorities in respective world city, and the interview sessions are comprehensive and fulfilled the objectives of the world city study.

Although the tendency of spatial dispersal and regional integration ought to be reshaping the world economy in creating the power of global city, the status of this global city have been assimilated by the concept of world city, and this urban study of cities has embarked on a new agenda. In addition, a global city is synonymous with a world city in some literature and articles, and tends to be perceived as an important articulation of the world economic system. Since the proliferation of globalization, these strategic hierarchical positions embedded in global financial and trading system have been created and dramatically sustained. The global city is the opposite to mega city, while this complex urban entity has a significant impact on the transformation of globalized socio-economic development. There is no doubt that this formation of cities can be viewed as a critical gateway in coordinating large amount of global business and financial capital.

Based on the above study detailing the world city and global city, there are some fundamental distinctions and similarities that can be found between these two concepts.

Firstly, world city studies tend to focus on the quantitative method and systematic analysis of inter-city relationship based on the relational data. Meanwhile, global city study concentrates on investigating the functional status and general features of urban development of global city. Specifically, an empirical study of inter-city relationships of world cities through the use of quantitative methods based on transportation and Internet data are major paradigms of world study, while a

detailed study of internal urban development based on producer services firms is an example of a global city study (X. Liu, Derudder, & García, 2013; Townsend, 2001).

The second distinction is related to the internal characteristic between these two concepts. The global city study aims to discover the characteristics of a global city in terms of its composition, and economic order, along with its social order. In the first part of the global city study, global city formation in the era of composition and globalization is qualified with several features. This includes, for instance, the centralization effect, foreign direct investment and expansion of the financial industry. Meanwhile, the second trend of economic order of global city is characterized by producer service development in the post-industrial global urban network and hierarchy. Furthermore, the mainstream view regarding the last characteristic is featured from an analytical insight towards spatial polarization, whereby it has a concrete cornerstone for robust employment labour markets, as well as possessing sustainable economic restructuring of urban developments.

In contrast to a global city study, the world city has some other distinctive features when compared to the global city. Based on the preeminent research of the GaWC research group, the current trend of world city studies tends to focus on the connections between cities. The global distribution of office networks of advanced producer services in a major network analysis is used to examine the inter-city connectivity between world cities. In addition to business network connections of world cities, a broader empirical study of infrastructure network and communication network is deemed to be a significant paradigm for research on the understanding of the connections between world cities. Meanwhile, in order to identify more urban hierarchies and inter-city connections, some mathematical modelling and spatial analyses are deployed simultaneously. Consequently, the general differences are