



HAL
open science

Urbanisation in China: regional development and co-operation among cities

Debin Du, Li Huang

► **To cite this version:**

Debin Du, Li Huang. Urbanisation in China: regional development and co-operation among cities: UrbaChina Working papers series NO 3 / July 2014. 2014. hal-01023259

HAL Id: hal-01023259

<https://hal.science/hal-01023259>

Preprint submitted on 11 Jul 2014

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



UrbaChina working paper series

No 3 / July 2014

Urbanisation in China: regional development and co-operation among cities

Authors:
DU Debin (HUADA)
HUANG Li (HUADA)



UrbaChina

UrbaChina is a collaborative project funded under the European Commission's Seventh Framework Programme.

Coordinated by CNRS (France's National Centre for Scientific Research), UrbaChina analyses China's urbanisation trends for the next 40 years and defines possible future scenarios with reference to concepts of sustainability.

UrbaChina managed by a consortium of 11 leading Chinese and European research institutions:

- Centre National de la Recherche Scientifique
- East China Normal University
- Development Research Centre
- University of Birmingham, Services and Enterprise Research Unit
- Chinese Academy of Social Sciences, Institute of Finance and Trade Economics
- London School of Economics
- Chinese Academy of Sciences
- Institute of Studies for the Integration of Systems
- University of Lisbon, Instituto de Ciências Sociais
- People's University
- Anhui academy of Environmental Science Research

Report information

Title: Urbanisation in China: regional development and co-operation among cities

Partners involved: East China Normal University, Huadong Shifan Daxue (HUADA)

Authors: Du Debin and Huang Li

Date of Publication: July 2014

研究伙伴：华东师范大学 (HUADA)

研究作者：杜德斌，黄丽

出版日期：二零一四年七月

The views expressed in this paper are those of the author(s) and do not necessarily reflect the views of the UrbaChina programme.

The UrbaChina working paper series is edited by the UMR 8173, Centre China Korea Japan.

Website: <http://umr-ccj.ehess.fr/?lang=en>

UrbaChina website: <http://www.urbachina.eu>

UrbaChina blog: <http://urbachina.hypotheses.org/>

Recommended citation

DU, D. and HUANG L. (2014). Urbanisation in China: regional development and co-operation among cities. UrbaChina Working Paper no.3, July 2014. Paris: CNRS

Urbanisation in China: The impact of the tax-sharing system and the definitions of new strategies

By Du Debin¹, Huang Li²

Abstract

This paper examines the regional patterns of urbanisation in China and co-operation among Chinese cities. By studying the case of Shanghai, the authors show that the central government's objective is to develop regional urban clusters and to promote exchanges and relations on a regional basis. Regional cities adopt different methods to exploit their geographical advantages. The analysis of the regional development of Chinese cities also underlines a broader question related to the optimum size of cities, and the emergence of city networks. For financial reasons, cities have favoured expansion rather than co-operation. In the Yangtze River Delta, competition is fierce among cities to attract foreign direct investment (FDI) and thus benefit from new infrastructures. Regional co-operation among Chinese cities is still not effective, therefore more policies need to be implemented to increase coordination, as opposed to replication and competition. The way in which cities finance themselves needs to be reformed to reach this objective.

Keywords: China, urbanisation, Yangtze River, urban expansion

摘要

本篇文章以上海为例，探讨中国城镇化过程中城市间的合作，透过城市间不同的区位优势，试图呈现城市发展的最佳规模与城市网络的最佳表现方式。本篇文章的重要性在于，因现阶段城市发展倾向扩大于现有城市，而不是强调城市间的合作，因此为了获得更多的城市建设资金，城市间的关系着重在彼此恶性竞争吸引外国人直接投资，故此区域间的城市合作则相当不足。故本篇文章建议，政府应在政策面应有所改革，加强区域协调合作，减少区域间的竞赛才是中国城镇化永续发展的最佳方式。

关键词：都市化，中国，城市化，长江，城市蔓延

¹ Professor and Department chair, Department of Human Geography, East China Normal University (dbdu@re.ecnu.edu.cn)

² Associate Professor of Human Geography at East China Normal University

Table of contents

Introduction	5
I. Urbanisation and regional development policy	5
a) Regional "Four Plates" pattern and urbanisation development.....	5
b) Urbanisation development and functional areas	6
c) The main body form of urbanisation: urban agglomeration.....	6
II. Relations between urban expansion and land finance: the case of Shanghai.....	6
a) Land leasing revenues: an important source of off-budget revenues for local government.....	7
b) Direct and indirect land taxes: the major tax sources of local fiscal budget.....	7
c) Real estate and construction development.....	7
III. Optimum city size in China: are Chinese cities too small?	8
a) Chinese and overseas studies and practice	8
b) Preliminary studies on optimum city size in China	9
c) The Yangtze River Delta	9
Conclusion.....	13
References	14
Tables and figures.....	16

Introduction

One of the central government main objectives is to boost co-operation among cities at the regional level. Several policies were implemented to control urbanisation and promote regional development, examined in the first part of this paper. In the Twelfth Five-Year Guideline (2011-2015), priority is given to greater coordination between urban centres, the development of medium cities and small towns and regional development specificities. To better understand these policies and analyse how effective they are, the second part will use Shanghai as a case study. Shanghai's principal need is to develop partnerships with neighbour cities to accommodate its expansion. There is also an on-going debate in China on the optimum size of city, reviewed in the third part. Since the 1990s and the 1994 tax reform, urbanisation has led to urban sprawl. Can this trend be sustainable? How can Chinese cities counter it? This last part of also looks at exchanges and competition in the Yangtze River Delta, dominated by Shanghai.

I. Urbanisation and regional development policy

a) Regional "Four Plates" pattern and urbanisation development

In the Eleventh Five-Year Guideline (2006-2010), the overall regional development strategy is mainly based on what is called the "Four Plates", which are the Western Development Strategy, the Northeast China Revitalization and other old industrial bases, the Rise of Central China, and the continued development of the East Coast. This strategy aims at improving regional

coordination and decreasing unbalanced development between regions.

The great development of the western region follows a path of development that is "adhere to stringing points with line and driving area with point and rely on central cities and main transportation to carry out key development" (Eleventh Five-Year Guideline (2006-2010), 2006). The revitalization of the northeast is based on a reform to "speed up strategic adjustment of the framework of state-owned industries and SOE reforms" (Guo, 2001, p.1-8). This plan is mostly based on city pilot projects. The central region should continue to develop on the existing basis, upgrade the industry level, and promote industrialisation and urbanisation. The eastern region should take the leading role in improving the capability of independent innovation, optimising and upgrading the economic structure and realising the transformation of growth. According to this national strategy, the future development of coastal provinces should also benefit to western and central China, and reduce regional inequalities (National Development and Reform Commission, 2006).

There is a large difference in development among Chinese regions, which is echoed in their level of urbanisation. As shown in table 1, the urbanisation rate in the east and northeast exceeded 55% in 2011, reaching 65.2% and 58% respectively. The level of urbanisation in the central and western areas was still low: 46.3% in central regions, 42.8% in western regions. In the future, the four major regions in China will experience different urbanisation patterns, according to the National Development and Reform Commission (2006): "East and northeast China have entered in a deceleration period to

focus on social welfare instead of GDP, while the central and western regions still remain in an acceleration period to catch up with the other developed region.”

Because of the recent societal and economic changes, the regional economic development model in China has transformed from rural to city-oriented. Therefore, following the strategy of regional coordinated development, each region needs to follow a different road to sustainable urbanisation that gives full play to local advantages.

b) Urbanisation development and functional areas

In the Eleventh and Twelfth Five-Year Guidelines, the major functional areas are based on resources capacity, existing development efforts and potential, population distribution, economic layout and urbanisation patterns. In the National Development plan, the strategy for urbanisation was structured on “two horizontal and three vertical axes” (Twelfth Five-Year Guideline (2011-2015), 2011), to guide the spatial distribution of urban agglomerations in China (see figure 1).

The "two horizontals and three vertical" pattern of urbanisation means to expand economic growth and market areas from East to West, and from South to North. The two horizontal axes are to build along the road from Longhai to Urumqi and the Yangtze River (Twelfth Five-Year Guideline (2011-2015), 2011). The three vertical axes are the length of the East Coast, the Harbin-Beijing-Guangzhou axis and the Baotou-Kunming axis. The goal of this policy is also to promote the optimisation of the three main urban centres, which are the Bohai Economic Rim, the Yangtze River Delta and the Pearl River Delta.

c) The main body form of urbanisation: urban agglomeration³

The Twelfth Five-year Guideline continued the approach of urbanisation development and concepts of major functional areas. It focused also on the coordinated development of big and medium cities and small towns.

“With the development of urban agglomerations, regions like Beijing-Tianjin-Hebei, Yangtze River Delta and the Pearl River Delta, which form the principle urban agglomerations, should continue to play their leading competitive role. This strategy also focuses on developing urbanisation in the least developed regions.” (Twelfth Five-Year Guideline (2011-2015), 2011)

The National Plan for Promoting Healthy Urbanisation (2011-2020), which was issued recently, emphasises the principle of sustainability. This plan promotes an urban evolution from rapid expansion to quality enhancement. In megaregions, such as the Beijing-Tianjin-Hebei region, the Yangtze River Delta and Pearl River Delta, priority should be given to international competitiveness. In central and western China, urbanisation should develop on a network of small and medium-sized cities.

After analysing these strategies, it can be argued that urbanisation has become one of the main reasons to address issues of regional inequalities.

II. Relations between urban expansion and land finance: the case of Shanghai

For the last twenty years, Chinese cities have gone through rapid expansion. Land development has become an efficient tool for municipalities to tackle urbanisation. The revenues collected from real estate are the main financial resource for

³ National Plan for Developing Functional Zones, 2014

municipalities and are used for implementing their numerous projects.

The expansion of Shanghai, China's major economic hub, was strongly conditioned by real estate development. In 1998, China made RMB 24.35 billion from land leasing of which Shanghai earned RMB 6.58 billion, accounting for more than 25% of the total. The proportion gradually reduced in the subsequent years, but was still quite high compared to the total in China. Therefore, there is an obvious correlation between the rapid expansion of Shanghai since the 1990s and land finance.

a) Land leasing revenues: an important source of off-budget revenues for local government

In 2001, Shanghai Municipal Government revised the Regulations of Leasing Land in Shanghai, which regulated that six types of operating land for commercial projects, tourism projects, entertainment projects, service industry and residence projects should be leased in auctions. The land that used to be allocated or leased then began to appear on auction market. As a result, the size and sum of land leasing began to rise sharply. Between 1999 and 2006, the number of cases and the area of leased land in Shanghai rose constantly and reached its peak in 2006 before the trend turned rapidly. In 2007, the number of land leasing cases fell by nearly 75% from the previous year. However, the unit price more than tripled. The sum of land leasing and unit price of land in 2008 rose tenfold of those in 1999. In 1999, the land leasing revenue was only 30% of the total off-budget revenues. After 2002, the land leasing revenue rose so rapidly that it exceeded the off-budget revenue. In the same period, the off-budget revenue changed slightly and reached RMB 22 billion in 2008, only accounting for 39% of the land leasing revenue in the period. So, this indicates that land-leasing

revenue has become an important revenue source for the government.

b) Direct and indirect land taxes: the major tax sources of local fiscal budget

Since 1999, direct land tax in Shanghai has risen steadily. In 2008, the direct land tax collected RMB 19.5 billion, accounting for 8.19% of total local revenues. The direct land tax includes tax of possession (urban land use tax and land VAT) and tax of transfer (farmland use tax and deed tax). The latter tax contributes the highest proportion of revenue, in particular the deed tax. Since 2008, Regulations of Urban Land Use Tax in Shanghai has divided the following regions into different land use tax rates, which resulted in sharp rise of urban land use tax rate. In 2007, it grew from RMB 1.07 billion to RMB 3,41 billion (see table 3).

Compared with direct land tax, the indirect land tax's proportion in local fiscal revenues has remained stable. As a matter of fact, it is influenced more by Chinese macro-economic control policies and real estate policies (Zhou, 2010).

As a result, though its proportion is always fluctuating, these fluctuations are not very drastic. In 2008, indirect land tax accounted for 60.13% of local fiscal revenues, only a 4.15% difference from its minimum in 2006. Indirect land tax mainly includes business tax, property tax and corporate income tax, which account for over 90% of the total. Real estate developers are still the major contributors to indirect land tax. From the above figures, it can be concluded that direct and indirect land taxes account for 70% of local budget revenues, which is relatively high. Therefore, they have become important sources of local budget revenues (see table 4).

c) Real estate and construction development

Evidently, city expansion has brought about the rapid development of the real estate and

construction industry (Zhang, Wang and Xu, 2011). At the beginning of the 1990s, real estate represented a small share of Shanghai's GDP. However, the share of value added by real estate development in Shanghai to its total GDP began to increase from 3.71% in 1995 to 7.4% in 2003, and the proportion of investment in real estate accounted for 37% of total fixed assets investment. The tax revenues related to real estate accounted for 25% of total retail sales. In downtown areas, 30% of fiscal revenues came from incomes related to real estate. Real estate revenues reached a peak at 8.25% of total GDP in Shanghai in 2004, and real estate has since become one of the six pillar industries of Shanghai. In recent years, area of under-construction real estate projects has kept rising. In 2007, the area of real estate construction projects reached 149.79 million m², or 1.73 times that in 2000. Over the past 10 years, the value added by real estate industry in Shanghai accounted for 5% to 8% of the city's total GDP, higher than the national average. The proportion of real estate revenues in district/county fiscal revenues often exceeds 30% and can even reach 40% or 50%.

III. Optimum city size in China: are Chinese cities too small?

Fiscal policies have encouraged Chinese cities to expand, and for the last twenty years Chinese cities have indeed increased in size. Is this expansion beneficial? What should the optimum size of Chinese cities be? In the past, Chinese cities each had their own individual strategy regarding their expansion, creating competition and redundancy among neighbours. The establishment of larger Chinese cities requires the activation of new city networks and a better coordination between regional hubs.

a) Chinese and overseas studies and practice

The optimum size of cities has long been a topic of debate in academic circles on urban and regional economics. It is also a major practical issue for cities in the process of urbanisation. China's urbanisation was lagging behind that of developed nations, but is now experiencing rapid urbanisation. Observing this process has brought a particular question to attention: what is the optimum size for Chinese cities? Or, more specifically, should China develop big or small cities? The answer to this question involves an examination of both theories and practice about the optimum size of cities.

Theories: The issue of optimum city scale originated in the concept of the Garden City, proposed by Sir Ebenezer Howard in his book *Garden Cities of Tomorrow* (published London: S. Sonnenschein & Co., Ltd. 1902). As the earliest theoretical guide for optimum city size, minimum cost theory held that the optimum size in terms of population is according to per capita cost. In general, the relation between city size and per capita cost forms a U-shaped curve, that is smallest and largest cities have higher per capita cost. Nevertheless, minimum cost theory still has its own drawbacks. According to Richardson et al. (1972), first, optimum city size is not just the function of cost; second, some non-economic factors also impact on optimum city size; third, optimum city size is not static at all. Alonso (1970), who developed the bid rent theory, believed that the marginal revenue and cost of a city would increase as its size expands. The former starts to decrease progressively, while the latter continues to increase. Where the two marginal curves intersect indicates optimum city size.

Practice: International experience has proved that cities, in particular large cities, are producing considerable aggregation, which in turn brings larger returns to scale (RTS), more job opportunities, a strong driving force for scientific and technological progress, and a positive effect on external diffusion. From the perspective of city agglomerate economy, optimum city size stands at between 5.5 and 6.5 million in terms of

population. Based on the Cost-Benefit Theory, Carlino (1982) used data on city size in the US between 1975 and 1997 and concluded that optimum city size in the US stands at about 3.88 million people. Most Chinese scholars, when studying optimum city size, do their research within a framework of cost-benefit analysis. The empirical studies by Chen and Jiang (2000) demonstrated that cities with a population ranging between 1 million and 4 million would have the maximum net RTS. The studies by Wang et al. (2002) revealed that super-large cities have the greatest economic benefits, followed by small cities, whereas economic benefits for cities of other sizes stay relatively low. According to Ma and Song (2003), there is no such thing as optimum size in city development. Moreover, large cities whose population ranges between 1 million and 2 million people or between 500,000 and 1 million people are the most efficient.

b) Preliminary studies on optimum city size in China

As a developing nation and a socialist country with the world's largest population, China's path to urbanisation is different from other countries, possibly unique. Chinese scholars have various ideas on city size in China. Currently, the three major viewpoints are: development of large cities, recommendation of small cities and diverse development. In practice, Chinese city development policy has long been to control size of large cities. However, is there any truth in the idea that Chinese cities are too large?

Many scholars believe that Chinese cities are not large enough and still need to expand. Wang and Xia (1999), after calculating the relative RTS (proportion of RTS in GDP of each city) and the function of relative external cost in 666 cities between 1989 and 1996, reached the conclusion that all cities with population ranging from 100,000 to 10 million people have positive net RTS. Among which, those with 1 to 4 million people have the largest net RTS. In accordance with input-output discrepancies of capital, land

and labour force in different scales, Yu (2000) employed a DEA approach and compared the scale efficiency of large, medium and small cities. His study concluded that urban comprehensive economic benefits increase as the city size expands. At the same time, large cities with a population of more than 2 million people and small cities with a population of more than 100,000 people have the largest RTS. Qin (2003), after analysing city size policies and RTS at different stages, believed that large cities have RTS in multiple aspects of economy, society and ecology. Based on this conclusion, he suggested China give priority to developing large cities and expanding city size.

Of course, some scholars take the opposite stand. Wu, Mao and Zhang (1996) believed that it is necessary to establish the concept of "super-large urban region" when making rural-urban plans. They also suggested that China should be more forward thinking by focusing on research of large cities, while promoting an overall balanced development of urban regions. At the same time, China needs to develop cities in both concentrated and spread out ways, while avoiding over-sized cities, excessive concentration, or urban sprawl. Yang and Chen (2001) did some preliminary studies of geographic expansion and land-use benefits of super-large Chinese cities in the process of enhanced suburbanisation. They believed that China should never take a reckless approach to developing large cities. The key objective is improving land-use efficiency. Xu (2009), by establishing the theory linking city size and environmental quality, concluded that optimum city size which allowed for progress in terms of environmental quality stands at 2.6 million people, and moderate city size ranges between 2 million and 3.5 million people.

c) The Yangtze River Delta

- **Empirical studies of optimum city size – the case of the Yangtze River Delta**

In 2010, the urbanisation rate in China stood at 49.23%, lower than the world average of 51.52% (see table 5). According to statistics from the 2010 Chinese Census, the total non-farming population in large cities with a registered population of over 2 million people reached 166.276 million, i.e. 12.4% of the total Chinese population. Professor John Quigley of UC Berkeley and Professor J. Vernon Henderson of Brown University pointed out in their report *Urbanisation in China: Policy Issues and Options* that the urbanisation in China is lower than its economic growth would usually entail. Most of the previous theories and empirical studies done by Chinese scholars about optimum city size in China were focused on the situation at the time of study. Besides, China's territory is so vast and so varied, optimum city size must therefore differ from region to region. Till today, there has been no evidence to indicate that China's cities are excessively large.

The Yangtze River Delta refers to the economic region lead by Shanghai and including Jiangsu and Zhejiang. It is now the fastest growing region with the most potential and the largest economic aggregate in the country. Since the reform and opening-up policy, city size in the Yangtze River Delta has been growing considerably. Table 6 shows that, by 2010 the Yangtze River Delta had 3 cities with a registered population of over 4 million people, i.e. 13.64% of the total number of cities in the region.

The optimum size of a city will depend on its position and function in the city network system to which it belongs, in either a nation or a region. The construction of various communication and information systems will change the distribution of cities and, therefore, conditions of optimum size. The city at the top of the hierarchy will be the largest economic centre of this system, with a larger exchange of material and information, and a larger range for optimum size. Meanwhile, cities at secondary or even lower levels in this economic system have less exchange of material, information and energy, which results in less

opportunity to expand, and therefore smaller optimum size. From a dynamic perspective, while the city system in the Yangtze River Delta continues to evolve, the optimum size of each city, each node of this network also changes constantly (Tian, 2009). Located at the top and central position in the city hierarchy system, Shanghai is the largest economic centre of this city system in the Yangtze River Delta. It has the largest exchange of material, information and energy, and thus has a larger scope for optimum size.

- **Co-operation and competition among cities in the Yangtze River Delta**

Shanghai, as the core of the Yangtze River Delta, has played a central role in building the city cluster in the region. The Yangtze River Delta cities formed a secondary economic circle centred on Shanghai, which expanded outward. The cities conform/follow/adapt to Shanghai's development in different ways, while actively receiving the beneficial effect radiating from Shanghai by identifying their positions and merging themselves into this economic circle. However, as the individual cities form and adjust their industrial structures, they start to compete against one another even as they continue to co-operate with each other.

- **Co-operation among cities in the Yangtze River Delta**

Cities in the Yangtze River Delta co-operate on the following areas:

- i. **Infrastructure:** Shanghai co-operates with other cities in the Yangtze River Delta to build roads, waterways, ports and other transport infrastructures in an effort to develop a region-wide transport system and an express inter-city transport route. At the same time, the Yangtze River Delta is also accelerating the construction of interconnecting natural gas pipelines to ensure that Shanghai and

- surrounding cities are able to supply each other with gas.
- ii. Information sharing: The industry and commerce bureaus of Shanghai and other cities have reached a consensus on market access, policy information sharing, private enterprises support and collective protection of well-known trademarks in the three provinces and cities of the region. IT experts have discussed the programme for “exemplary application in the Yangtze River Delta of high-performance broadband information network”, thus paving the way for developing information highways in the Yangtze River Delta.
 - iii. Common market for talent: A forum on Integration of HR Development in the Yangtze River Delta was held, where participants discussed establishing a regional HR common market, integrating the new institutional framework and mutual recognition of professional certificates. Special equipment manufacturers in Jiangsu Province, Zhejiang Province and Shanghai can manufacture their products in the Yangtze River Delta with local certificates and permits.
 - iv. Integration of tourism resources and financial co-operation: Cities in the Yangtze River Delta are now integrating their tourism resources, facilitating regional co-operation in tourism, developing tourism centres in central cities, and compiling the *Around Lake Tai Tourism Plan* and brochures introducing tourism in Jiangsu Province, Zhejiang Province and Shanghai. Furthermore, representatives from the People’s Bank of China offices in 16 cities in Jiangsu Province, Zhejiang Province and Shanghai have discussed establishing a framework of financial co-operation in the Yangtze River Delta, cross-regional co-operation on financial supervision, and integration and co-operation on developing infrastructure of currency and capital market.
 - v. Industry specialisation: Of all the co-operation mechanisms in the Yangtze River Delta, industry specialisation is the most important and difficult because there would be no genuine integrated development of city clusters without proper specialisation. Specifically, without proper industry specialisation, city cluster would not shape themselves to complement the advantages of cities in the region. For the moment, there are still many setbacks to co-operation in the Yangtze River Delta, particularly in terms of industrial specialisation among these cities that have similar industrial structures.
 - **Competition among cities in the Yangtze River Delta**
- As the process of globalisation speeds up, cities in the Yangtze River Delta are now working hard to integrate the global economy in an effort to find their position on an international level while they are still peripheral cities in this economic sphere. These ambitions force the cities of the Yangtze River Delta to face a new challenge: intercity competition, not only between Shanghai and other cities in the region, but also among the cities themselves.
- First, Shanghai and other cities mainly compete to get foreign investment. Foreign direct investment (FDI) is the major driving force for these cities to develop high-tech industries and help their institutions and regulations merge with international practices. The aggregate of FDI is fixed within a certain time period and geographical area. If a city attracts more FDI, it means another city in the region will receive less. As a result, Shanghai is in fierce competition with the other cities in the Yangtze River Delta to attract and use FDI.
- Second, Shanghai competes with secondary regional central cities in the Yangtze River Delta, such as Nanjing and Hangzhou, the capital cities of Jiangsu Province and Zhejiang Province respectively. These two cities are political, economic and cultural centres, secondary central cities in the city cluster. As regional economic

integration and multi-polarization develop in Yangtze River Delta, Nanjing and Hangzhou naturally become leading cities for second or third levels of cities in the Yangtze River Delta (Xu and Zhao, 2005).

Third, the other cities in the region compete against each other to benefit from the favourable effect radiating from Shanghai. As Shanghai works hard to develop itself into four centres, it is highlighted as a hub connecting the international and Chinese markets. Nowadays, the rapid growth of Suzhou and Wuxi can be attributed mainly to Shanghai's influence, which has encouraged Nanjing, Hangzhou, Ningbo and other cities in the region to proactively get closer to Shanghai to have access to the international market.

- **RTS (Returns To Scale) analysis of city clusters in the Yangtze River Delta**

Table 7 studies the RTS of 22 cities in the Yangtze River Delta based on their general population growth rate, non-farming population growth rate, per capita GDP, GDP growth rate and changes of industrial structure since the 1990s.

The static and dynamic indicators as shown in the table reveal that large cities such as Shanghai, Nanjing and Hangzhou have absolute advantages. The indicators of their per capita GDP are higher than those of smaller cities. Furthermore, as urban population keeps growing, the large cities' industrial structures have been constantly optimised and living standards consistently improved. Nowadays, Shanghai, Nanjing and Hangzhou present an evidently strong service industry, followed by manufacturing and agriculture. However, manufacturing is still in the leading position in other big cities in the region, followed by service and agriculture industries. The optimality of the industrial structure is in positive proportion to the city size. This fact further proves cities in the Yangtze River Delta are still within an optimum size range because of aggregation.

Conclusion

Urbanisation has now become a driving force of China's economic development and it also constitutes the backbone of China's new strategy to reduce regional inequalities as it appears in the "two horizontal and three vertical lines" development plan. In the coastal provinces, three megaregions (the Pearl River Delta, the Yangtze River Delta and the Bohai Economic Rim) have emerged from urbanisation. These urban centres need more co-operation to foster their competitiveness. This research shows us that the fiscal system adopted in China favours city expansion, but prevents efficient regional co-operation and limits the optimum size of Chinese cities.

Furthermore, urban issues should not always be associated to city size, but result from problematic institutions and policies and irrational urban planning and management. In the case of the expansion of Shanghai, priority should be given to optimising activities, upgrading structures and improving the environment. While promoting urban development and expanding its size, Shanghai should focus on science-based spatial development and rational population distribution, while ensuring sustainability and continuing to solve possible conflicts between urban development and expansion so that they complement and promote each other. Only in this way can Shanghai become even more competitive.

References

- Alonso, W. (1970). The economics of urban size. (Working Paper 138). Berkley: University of California, Center for Planning & Development Research.
- Chen, W., & Jiang, H. (2000). Urban economies of scale and development policies. *Financial Sciences*, 4, 67-70.
- The Central People's Government of the People's Republic of China. Notice from the State Council on the issuance of the National Plan for developing functional areas (*Guowuyuan guanyu yinfa quanguo zhuti gongneng qu guihua de tongzhi*, 国务院关于印发全国主体功能区规划的通知). Retrieved 8 June, 2011, from http://www.gov.cn/zwggk/2011-06/08/content_1879180.htm
- Guo, K.S. (2001). The strategic adjustment of China's industry structure in the next five years. Retrieved 2001, from <http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan003181.pdf>
- Ma S., & Song L. (2003). Comparative study and analysis of the development of China's city size. *Statistical Research*, 20 (7), 30-34.
- National Development and Reform Commission. The Eleventh Five Years Plan should reveal narrowing of the gap between East and West on the national economic map. Retrieved 20 January, 2006, from http://www.ndrc.gov.cn/xxfw/qyvb/t20060120_57543.htm
- Qin Z. (2003). On city size policies and urban economies of scale. *Economic Issues*, 10, 1-3.
- Report from the Fourth Session of the Eleventh National People's Congress (2011-314)* 21
- Report from the Fourth Session of the Tenth National People's Congress (2006-314)* 24
- Richardson, H.W. (1972). Optimality in city size, systems of cities and urban policy: a sceptic's view. *Urban Studies*, 9 (1), 29-48.
- Tian L. (2009). Research on the riddle of optimum city size—an explanation of urban economies of scale. *Urban Planning Forum*, 2, 63-68.
- Wang D., & He X., & Dong G. (2002). Empirical study of the relationship between city size and urban economic benefits. *Journal of Laiyang Agricultural College (Social Sciences edition)*, 3, 23-25.
- Wang J. (2007). *Land standard analysis and updated countermeasures for urban planning and construction*. Unpublished M.C.E thesis, Tongji University, Shanghai.
- Wang X., & Xia X. (1999). Optimize city size to promote economic growth. *Economic Research*, 9, 22-29.
- Wu L., & Mao Q., & Zhang J. (1996). Facing the 21st century: the future of Chinese megacities, with Beijing, Shanghai and Guangzhou as examples. *Urban Planning*, 4, 22-27.
- Xu C. (2009). Study of Chinese city size based on environmental quality. *Geographical Research*, 28 (3), 792-802.
- Xu K., & Zhao B., & Wang Q. (2005). The Yangtze River Delta city cluster: formation, competition and cooperation. *Social Sciences in Nanjing*, 5, 1-9.

Yu Y. (2000). Study of reasonable size Chinese cities and their efficiency. *Economic Geography*, 20 (3), 84-89.

Yang Y, & Chen Z. (2001). A preliminary study of geographical expansion and land use efficiency of Chinese megacities. *Human Geography*, 16 (2), 53-56.

Zhang, L., & Wang, X.B., & Xu, X.X. (2011). Fiscal incentive, political incentive and local officials' land supply. *China Industrial Economics*, 4, 35-43.

Zhou, F.Z. (2010). A great bustle of masons and carpenters: land finance and local government behaviour. *Economic and Social Systems*, 3, 77-89.

Tables and figures

Table 1. China's regional urbanisation rate in 2011 (%)

Source: Compiled and computed from relevant figures from China Statistical Yearbook (2012)

Region	Rate	Region	Rate	Region	Rate	Region	Rate
Beijing	86.2	Shanxi	49.7	Inner Mongolia	56.6	Liaoning	64.1
Tianjin	80.5	Anhui	44.8	Guangxi	41.8	Jilin	53.4
Hebei	45.6	Jiangxi	45.7	Chongqing	55.0	Heilongjiang	56.5
Shanghai	89.3	Henan	40.6	Sichuan	41.8		
Jiangsu	61.9	Hubei	51.8	Guizhou	35.0		
Zhejiang	62.3	Hunan	45.1	Yunnan	36.8		
Fujian	58.1			Xizang	22.7		
Shandong	51.0			Shaanxi	47.3		
Guangdong	66.5			Gansu	37.2		
Hainan	50.5			Qinghai	46.2		

Table 2. Fact sheet for Shanghai Land Conveyance (1999-2008)

Source: China statistical yearbook of land and resources (1999-2009)

Year	Plots of land	Area of land (hectare)	Income from land conveyance (billion yuan)	Extra-budgetary revenue (billion uan)
1999	1187	2006.74	4.295	15.411
2000	1368	2252.76	3.483	18.171
2001	1981	5228.33	8.331	14.700
2002	1621	6729.94	12.825	14.926
2003	1538	6985.85	29.424	16.293
2004	1738	7135.04	49.218	12.390
2005	1539	6491.31	38.975	15.427
2006	2611	7680.13	37.878	16.853
2007	684	2180.60	38.047	27.622
2008	663	2468.15	57.026	21.997

Table 3. Land Direct Tax revenue (billion yuan)

Source: Shanghai finance and tax yearbook, China tax yearbook

Year	Land direct tax income				Share of local fiscal revenue (%)
	Urban Land Using Tax	Land value increment tax	Farmland conversion tax	Deed tax	
1999	0.219	0.144	0.069	1.174	3.719
2000	0.201	0.062	0.107	1.438	3.725
2001	0.205	0.015	0.128	1.892	3.612
2002	0.215	0.013	0.316	3.685	5.875
2003	0.225	0.166	0.321	6.348	7.851
2004	0.213	0.213	0.366	8.700	8.477
2005	0.209	2.463	0.339	11.104	9.844
2006	0.258	3.568	0.361	8.313	7.811
2007	1.071	4.740	0.203	11.588	8.371
2008	3.409	4.943	0.153	10.999	8.187

Table 4. Land Indirect Tax Income (billion yuan)

Source: Shanghai finance and tax yearbook, China statistical yearbook, Shanghai statistical yearbook

Year	Land indirect tax income				Share of local fiscal revenue (%)
	Urban maintenance and construction tax	House property tax	Business Tax	Enterprise Income Tax	
1999	2.059	1.289	14.318	8.931	61.589
2000	2.201	1.324	15.381	10.312	60.194
2001	2.475	1.466	19.112	14.975	61.312
2002	3.021	1.968	25.185	13.946	61.296
2003	3.562	2.241	33.231	14.615	59.657
2004	4.346	2.708	44.246	20.499	64.122
2005	4.980	3.410	51.293	24.915	58.999
2006	5.300	4.268	55.867	24.147	55.976
2007	6.533	4.283	71.460	42.563	59.373
2008	6.880	5.222	76.338	54.799	60.125

Table 5. The proportion of urban population to total population (%)

Source: Population statistics project of the World Bank (2010)

	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010
The world	35.51	36.54	37.69	39.32	41.13	42.88	44.70	46.61	49.06	51.52
China	18.09	17.40	17.40	19.36	22.87	26.44	30.96	35.88	42.52	49.23
Brazil	51.04	55.91	60.79	65.47	69.86	73.92	77.61	81.19	82.83	84.34
Japan	67.87	71.88	75.72	76.18	76.71	77.34	78.02	78.65	85.98	90.54
Korea	32.35	40.70	48.03	56.72	64.88	73.84	78.24	79.62	81.35	82.93
Russia	58.17	62.47	66.43	69.75	71.92	73.39	73.37	73.35	72.93	73.65
S. Africa	47.25	47.81	48.11	48.43	49.37	52.04	54.49	56.89	59.26	61.55
United States	71.88	73.60	73.65	73.74	74.49	75.30	77.25	79.09	80.73	82.14

Table 6. Population size distribution in the Yangtze River Delta (2010)

Source: China city statistical yearbook (2011)

Size grade (million)	City name	Number
> 800	Shanghai	1
400 ~ 800	Nanjing, Hangzhou	2
200 ~ 400	Suzhou, Wuxi, Changzhou, Ningbo, Huaian, Hefei	6
100 ~ 200	Yanzhou, Huzhou, Taizhou, Zhenjiang, Yancheng, Xuzhou	6
50 ~ 100	Nantong, Taizhou, Jiaxing, Shaoxing, Zhoushan, Maanshan, Jinhua	7

Note: Population data comes from the number of registered population of urban municipal districts



Table 7. Comparison of cities' economic development and its speed

Note: the population growth rate of Suzhou, Wuxi, Changzhou and Zhoushan are from 1990-2001, the number of population registered and per capita GDP of Xuzhou, Nantong and Taizhou date back to 2008.

City name	Population registered (million)	Per capita GDP (yuan)	Rate of population increase (%)	Rate of GDP increase (%)	Industrial structure	
	2011	2011			1990	2011
Shanghai	1419.36	135241.87	0.43	13.2	1.7:47.6:50.7	0.7:41.3:58
Nanjing	636.36	96573.01	0.92	14.7	5.1:47.5:47.3	2.7:44.9:52.4
Hangzhou	695.71	100786.25	0.89	14.2 (1979-2011)	7.1:50.6:42.3	3.3:47.4:49.3
Suzhou	642.3	163475.01	0.51	11.30	5.2:56.8:38.0	1.7:55.6:42.7
Wuxi	467.96	147024.32	0.68	9.70	4.0:55.2:40.8	1.8:54.2:44.0
Changzhou	362.9	98660.79	0.67	10.00	7.0:56.6:36.4	3.1:54.5:42.4
Ningbo	576.4	104276.2	0.68	12.30	7.6:54.8:37.6	4.2 : 55.3 : 40.5
Huaian	543.24	31109.64				13.2:47.0:39.8
Hefei	706.1	51502.6	1.27 (1996-2010)	16.97 (1996-2010)		6.3:50.2:43.5
Yangzhou	460.05	58950	0.23 (1990-2007)		13.3:48.7:38.0	7.0:54.3:38.7
Huzhou	261.05	58302	0.60	13.45 (1990-2010)	13.1:53.9:33.0	7.7:53.8:38.6
Taizhou	586.79	47779	0.60	14.70		6.9:50.5:42.6
Zhenjiang	271.86	73947	0.50	9.40		4.4:55.1:40.5
Yancheng	820.69	38222				16.0:47.1:37.8
Xuzhou	976.7	36363.78				9.4:50.0:40.6
Nantong	763.72	35040	0.36	9.10	16.8:48.5:34.7	7.0:54.5:38.5
Taizhou	507.1	39490.8			15.3:47.9:36.7	7.3:55.0:37.7
Jiaying	343.05	77774.67	0.63 (1979-2011)	13.9 (1979-2011)	10.5:55.2:34.3	5.3:57.4:37.3



Shaoxing	440.01	74798.98	0.60	11.70	9.8:58.1:32.1	5.2:56.0:38.8
Zhoushan	96.99	79673.16	-0.03	9.10	26.1:34.1:39.8	9.9:45.1:45.0
Maanshan	228.61	50049.43				5.8:68.1:26.1
Jinhua	469.07	52182.2				5.1:50.9:44.0

Figure 1. Urbanisation and the two-horizontal/three-vertical urbanisation strategy

