



JÖNKÖPING INTERNATIONAL BUSINESS SCHOOL
JÖNKÖPING UNIVERSITY

The Impact of Trade Openness on Urbanization

A study of Eastern China

Bachelor Thesis in Economics

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Abstract

This thesis analyses the impact of trade openness on urbanization in eastern China during the period of 1987 to 2005. The theoretical framework shows that open trade has a positive impact on growth of urban population, because trade serve as a factor that creates great job opportunities. According to the descriptive data, the massive rural-urban migrations are mostly concentrated in the eastern coastline of China where trade was started. Previous studies concluded that there is a positive relationship between trade openness and urbanization.

Our study is based on a set of panel data from the period of 1987 to 2005 within 6 coastline provinces. After running 4 different regressions we found that, 3 of the regression models revealed positive and statistically significant at 1% results, which suggest that the impact of trade openness on urbanization is positive.

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1 Introduction

China's rise is a significant event in 21st century. In 2008, China overtook Germany as the third biggest economy in the world. Behind this is an impressive story about China's urbanization: China has the world's biggest urban population---456 million; furthermore, the growth rate of urbanization is also accelerating, which is approximately 1% growth every year after 1978 (National Statistic Bureau 2008).

At the meantime, China has evolved from a closed central-planning economy to a highly international and market-oriented economy. China's global trade exceeded \$2.4 trillion at the end of 2008, ranking the second biggest in the world (World Bank, 2008).

The economic growth directly accelerates China's urbanization, which is the unprecedented 'urban transition' ever happened in human history (Clifton, 2002). Meanwhile the reason for the economic growth itself can be attributed to an openness policy according to recent research (Gordon, 2004).

“As more people move to urban areas, not just in China, but elsewhere in Asia and Africa, the focus of development activities must be twofold. . . . Rural development which remains critical in agriculture-based economies; and rapid urban industrial development which is and will be the principal source of growth for the national economy.”

---Justin Lin, World Bank Chief Economist

The 'Reform and Open' policy implemented 30 years ago has changed the fundamental economic situation in China, getting tens of millions of people out of poverty by mass urbanization and making China a major power in the international economic arena. Although estimates of the size of floating population¹ vary, the floating population's influence is significant in recent history (M.C. 2000). For instance, there are 13 million urban guest² workers in Guangdong province close to Hong Kong, and in the city of Shanghai there are another four million (Kahn and Smith, 1995). In 1990 the Chinese government had estimated the floating population to be between 60 and 80 million (Wakabayashi, 1990), while today that number could easily exceed 100 million. Wu and Zhou (1996) estimated that, ever since 1990 China's annual rural-to urban migration labor flow has been 50 to 60 million people, and of that 10 to 15 million migrants will permanently settle down in the urban area. This has no doubt represented an important force in the urbanization of China.

Economists try to explain this so-called miracle in different ways. However, most of current research focused on either urbanization or economic openness. Since China has both huge urbanization potential and high economic openness, it is important to understand the mechanism of how they related to each other. The purpose of this thesis is using econometric tools to explore the possible relation between Chinese urbanization and its economic openness.

The reason for us to take the focus of eastern Chinese regions is because in those areas, it is easy to find the most rural-urban migration mobility together with growth in trade (see

¹ Floating population indicates the new rural-urban labor mobility in China.

² They do not have permanent residence.

figure 1 and 2 below). For example the Guangdong province, it is used to be one of the most uncultivated and sparsely populated regions in China in early history, while now it is the fast growing region with both high export volumes and urban population. According to Shenzhen Bureau of Statistic, Cities in Guangdong province have high urbanization rate, for example, Shenzhen is the first city achieved 100% urbanization rate in China in 1998.

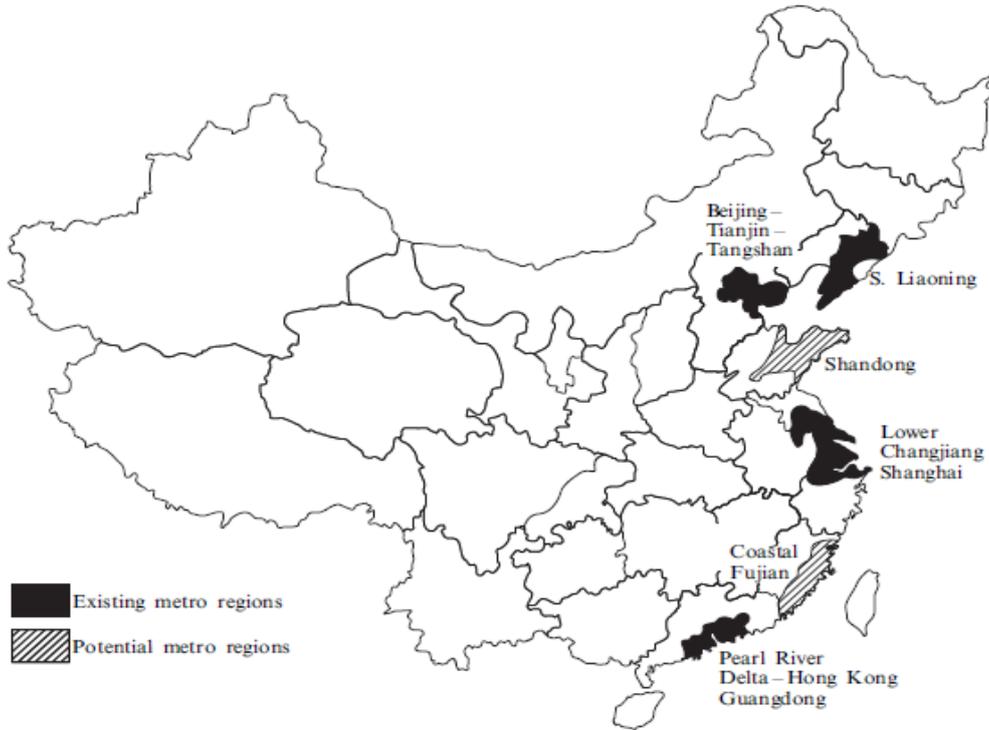


Figure 1 Newly emerging extended metropolitan regions in China (1991).

Source: (Pannell, 1995).

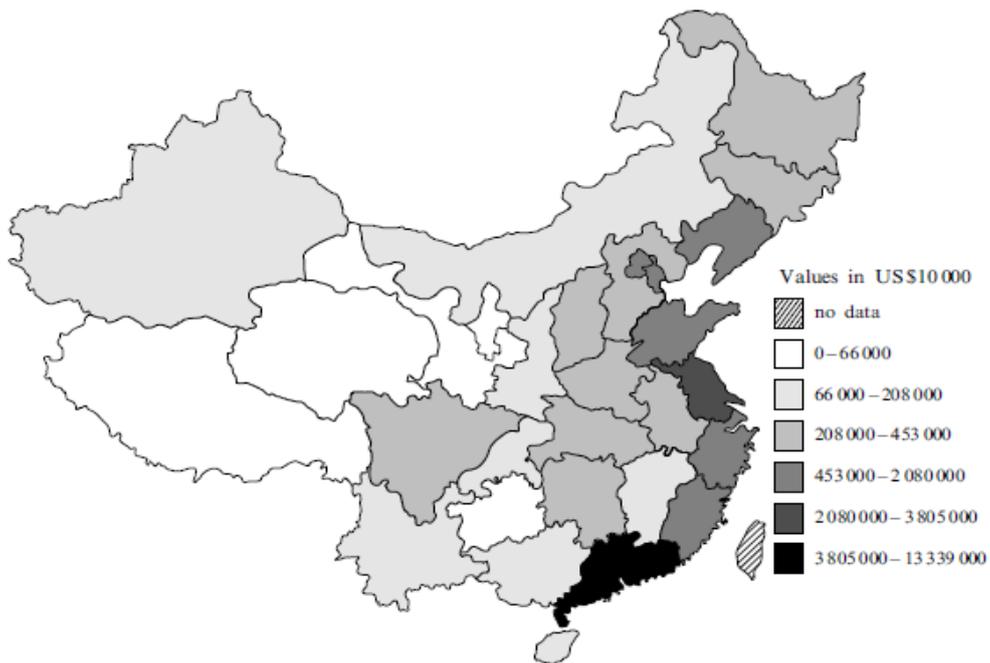


Figure 2. Total value of imported and exported commodities in China, 1999.

Source: Pannell (2002)

In figure 1 above we can see that the metro regions which is the urban population concentrated areas are located along the east coastline. And in figure 2 above, we can observe that the higher value of trade also occurs in the east regions. Especially for Guangdong province, its urbanization rate is the highest in the country, the same goes for its total value of trade (National Statistic Bureau 2008).

1.1 Purpose

The purpose of this thesis is to empirically analyze the impact of trade openness on urbanization in eastern Chinese regions over the period of 1987-2005.

And this forms the research question: How does the trade openness affect the rate of urbanization in eastern Chinese regions?

Research hypothesis: Across the eastern Chinese regions as well as across time, urbanization rate is higher for those regions that are more open in trade.

1.2 Outline

The rest of the paper is organized as follows. **Section 2** gives a brief background of our research topic, including an introduction of China's regions, history of China's trade and urbanization; within the history, we first introduce to the readers China's urbanization history and its 'Reform and Open' policy, and then provide a summary of previous research on the topic, followed up by a theoretical framework that describes the supporting theory for our study. **Section 3** summarizes the descriptive data that represents the growth of trade openness and urbanization in China. **Section 4** aims at showing our empirical analysis of our study: the regression models and the regression results. **Section 5** gives a conclusion of our thesis and some suggestions for future research.

2 Background

In this section the authors will first provide an introduction about Chinese regions; and then some history regarding China's urbanization and trade openness; in addition to those, some important institutional factors will also be introduced, in order for the readers to understand the uniqueness of China's urbanization.

2.1 China's regions

There are 22 provinces, 5 autonomous regions and 4 agglomerations in China (see figure 3). Each province is different from the other regardless of the population size or the geographic features.

Henan province has approximately 97.1 million inhabitants as the biggest province in China in term of population; and on the other hand the province Tibet, which has only 2.7 million people living, is the least populous.

The agglomerations in China are Beijing, Tianjin and Shanghai. Then there are five autonomous regions as the five big non-Han ethnic groups living area, and they are Guangxi, Tibet, Xinjiang, Inner Mongolia and Ningxia. Last but not least the two Special Administrative regions: Hong Kong and Macau. They are called the Special Administrative regions because they are independent from the rest of China, and they have their own governments, legal systems.



Figure 3 Map of China.

Source: Fujita & Hu 2001, p.6.

According to Demurger, Sachs, Woo, Bao, Chang and Mellinger (2002) China's regions are divided into 6 main categories:

The metropolises of Beijing, Tianjin, and Shanghai have province-level status. These 3 big cities had their very high growth in the 1990s, and they are highly industrialized, over 71 percent of their population lives close to the coastal areas or navigable waters. Also they are relatively rich compared to the rest of China. In 2008, Shanghai, Beijing and Tianjin rank the top three GDP per capita areas in China (National Statistic Bureau 2008).

The northeastern provinces of Heilongjiang, Jilin, and Liaoning, used to be the industrial heartland of China in 1949, due to the Japanese control of the economy since 1905; then later on during the central planning period, because of their early start in industrialization, made them resemble provinces of the Soviet Union in industrial organization and production structure.

The coastal provinces are Hebei, Shandong, Jiangsu, Zhejiang, Fujian, Guangdong, and Hainan (Hainan was separated from Guangdong in 1988). About 82% of these provinces' population lives within 100 kilometers of the sea or navigable rivers. This group is the fastest growing among all six groups; between 1978 and 1998, they were having an average annual growth of 10.7%. Zhejiang and Guangdong have reached the top of the GDP per capita ranking after omitting the three metropolises in 1998.

The central provinces, geographically divided as from the north of Yellow River to the south of Yangtze River, are: Shanxi, Henan, Anhui, Hubei, Hunan, and Jiangxi. The nature endowment of this area makes this region the agricultural heart of China, which can also use to explain the size of its population.

The northwestern provinces comprise Inner Mongolia, Shaanxi, Ningxia, Gansu, Qinghai, Xinjiang and Tibet. The center of these regions is about 1,400 kilometers away from the coast line, further more in the western and northern borders of these regions are desert, and the slope of these lands is much higher than the ones in central provinces. Also the general lack of water worsened agriculture. Only 8% of land is useable. That is why they had the lowest population in China.

The southwestern provinces of Sichuan, Yunnan, Guizhou, and Guangxi have the opposite situation; they are endowed with rainfall and ideal temperature conditions for growing crops. However, since they have few mineral resources, they had the lowest GDP per capita in 1978, also had the lowest growth rates during the market-oriented reform period.

2.2 History of China's urbanization and trade openness

The concept of urbanization actually includes both physical growth of urban areas from rural areas and the result of population immigration to an existing urban area, which is the urban population, versus the rural population. However in this thesis, the study is limited to only the urban population growth as the urbanization. And also, since there are different measurements for one to define trade openness, we define trade openness as the total value of trade.

Before we break the history down into different time periods, we first introduce two graphs that illustrate the trends of urbanization rate and total trade growth. As we can see in both trends there are substantial growth, however in order to understand the different stages in the trend we will have to break down the history.

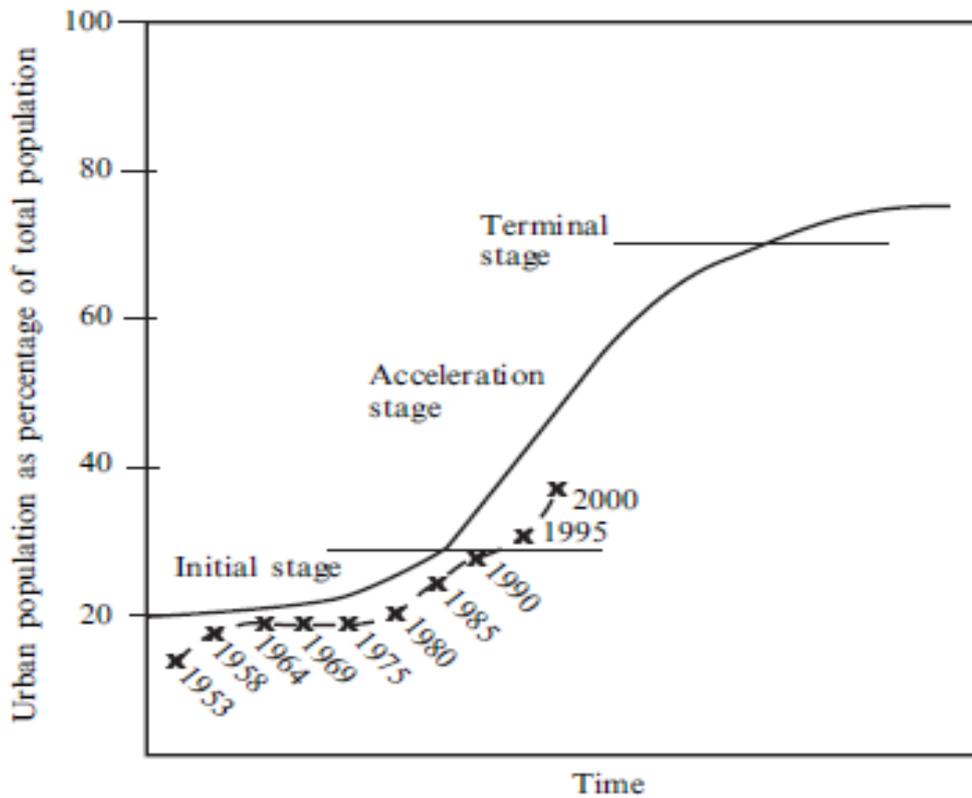


Figure 4: China's urbanization level in the context of the urbanization curve (---) and stages of urbanization (x ^ x urbanization level and year).

Source: (Pannell, 1995).

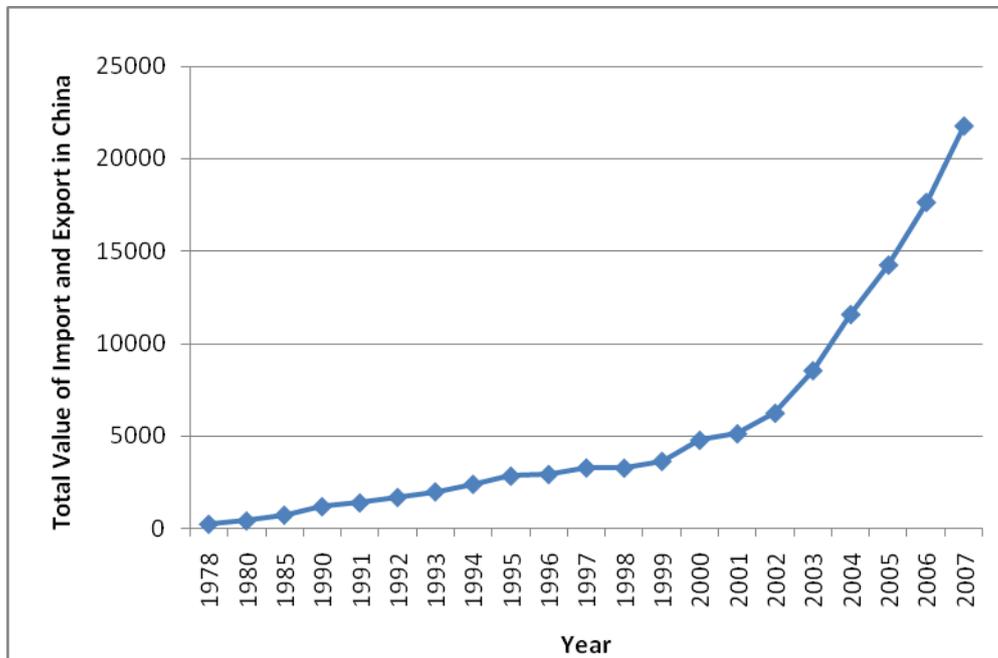


Figure 5 Growth of total trade in China.

Source: made by the authors, data from the National Statistic Bureau of China.

Before the establishment of People's Republic of China (before 1949)

Agriculture economy dominated China's urban establishment for about two thousand years. The early determinant factors for urban areas formation also include trade openness, but different from today's sea-based trade, the early trade-urban relation is more land-based. The history background for China's urbanization in early age can provide deep insight for understanding the trade-urban relation in terms of a long time span.

According to Demurger et al. (2002) the location of China's economic center has shifted in the past. The original economic center was Loess Plateau and the Yellow River Valley, where the Chinese civilization began in 2000 BC, nearly 1,000 kilometers away from the coast line. Later on the economic center was moving from the Loess Plateau and the Yellow River Valley towards to the Southeast. The very reason for this original location of the economic center was in the early age, one important driving force for agricultural production is to be close to the land-based trade rather than the sea-based trade. At that time the international trade was only conducted through the famous Silk Route which mainly passed through northwest part of China. The coastal areas, where Guangdong and Fujian provinces located nowadays were seen as "uncultivated and sparsely populated" in early history. Today these two provinces have the most dynamic economies in China. In fact, the reason for "uncultivated" in the past is not due to natural conditions (since those areas were favorable for agriculture with the humid temperature), but because of malaria and other subtropical diseases, which kept the population low. In addition, the high temperature itself reduced people's productivity substantially. As the results, Guangdong was considered in people's eyes the most uninhabitable place³.

Over time, the pressure from expanding population and the invasions from the northern tribes caused more movement of the population to the south, into the middle coastal and southeast regions. So by the 12th Century, the Yangtze River Valley became the most developed with a large settled population. Gradually the importance of coastal region started to be recognized.

After the Opium War in 1840, the economic importance of the coastal region increased significantly when the Western world forced China to open several ports for trading. From then on, modern international trade occurred and expanded fast, foreign direct investment started to flow in, and local industrialists made their first appearance, all of which concentrate in the mid-coastal and southeast regions. This "open door" process formed a set of initial foundations of today's urban areas, for example, Shanghai and Guangzhou. However, the trend was stopped by the Communist revolution.

Pre-reform period (1949-1978):

China's urban population growth can be seen containing two stages after 1949 communist revolution (Clifton, 2002). It has relatively stable growth during 1949-1978. At the beginning of the communist rule, in 1953, China had only 78 million people living in cities, which was approximately 13% of the total population at that time (Kirkby, 1985). On average, the urbanization rate grew steadily by around 4% from 1950 to 1965. During the "Great Leap Forward" period launched by Mao Zedong, who intended to complete massive socialist industrialization faster, the urban population grew rapidly. Then in the

³ *The great Chinese poet of the eleventh century, Su Dongpo (1037-1101), who was banished by the emperor to Guangdong, wrote that the only saving grace of living there was the abundance of the lichee fruit: "having three hundred lichees daily, I do not mind to be a person living in the south of Nanling Mountain (where Guangdong is located)" (woo et al. 2002, pp. 9)*

Cultural Revolution period (1966-1976), where large numbers of young people were forced to immigrate to rural areas to receive “re-education”; the urbanization trend was reversed.

According to Demurger et al. (2002), China gradually reduced its discrimination towards foreign investments in the coastal provinces from 1972 to 1978, allowing economic interaction in those provinces with capitalist economies. This policy was applied since the government started to realize that China’s economic vitality and technological capacity was far behind the western world. If this situation continued, China could easily be threatened by other nations, especially by the Soviet Union, which at that time had more threatens to China than the West. Therefore China was eager to import foreign technology.

There are two key conclusions that can be drawn: (1) the urbanization in China was strongly influenced by political policies; (2) China at that time was a closed socialist country with little international economic connection to rest of the world.

‘Reform and Open’ policy to present (1978-2008):

When Deng Xiaoping took the power in 1978, he changed China from a Stalinist closed economy into an open and market-oriented economy. He successfully made the ‘Reform and Open’ policy the fundamental principal in China.

Urban population growth began to accelerate from that point. The special economic zones (SEZs)⁴ were founded along the coastline, where the policies allow them to attract substantial inflow of foreign direct investment (FDI) and generated massive employment opportunities, which fostered urban population growth. (Pannell, 1995)

The urbanization rate in China has grown from 17.92% in 1978 to 43.90% in 2006. In 1980, China’s urban population was 191 million. By 2007, it was 594 million, excluding migrants (National statistic bureau, 2007). If China could achieve its goal of the ‘well-off society’⁵ in 2020 (the urbanization rate should be above 60% at that time), the urbanization rate has to increase 1% a year, which means approximately 12 million people have to migrate from rural to urban areas every year. Although the urbanization rate is still below the world’s average, its growth is unprecedented. According to Professor Lu Dadao, president of the Geographical Society of China (GSC), China’s urbanization rate took 22 years to increase from 17.9% to 39.1%; which took Britain 120 years, US 80 years, and Japan more than 30 years to accomplish. (Ma, 2002)

For the past three decades, China has experienced a tremendous economic transformation. The export-led economy has been growing together with urbanization. However, before we study the relationship between the two it is important to understand the underlying institution behind rural-urban migration, that is, *Hukou*⁶.

The institutional factor: *Hukou* and dual economy

China’s socialist past has left a special *Hukou*³ system, which has been the main barrier of rural-urban immigration. There are two types of *Hukou*, rural *Hukou* and urban *Hukou*,

⁴ Special Economic Zone, it’s a region in Eastern China that designated for economic development oriented toward FDI and exports, fostered by special policy incentives.

⁵ The Well-off society” is the economic vision for year 2020 that set up by the Chinese Communist Party.

⁶ Type of household registration used in China.

which are the segregation of people economically and socially between rural and urban areas. This system was basically used for 'one child policy' at first. However, it restricts the free movement of labor from rural to urban places, which has created a big gap between the two areas and thus, a dual economy. For quite a long time after communist revolution, *Hukou* system ruled out nature urbanization process, thus almost all urbanization before the open policy can be attributing to political reasons. Feng Wang (1999) has summarized some reasons for the persistent gap between rural migrants and urban residents created by *Hukou* (Feng Wang, 1999):

1. Segregated labor market and occupations,
2. Low income and poor benefits for rural areas,
3. Temporary housing and residential segregation for rural migrants,
4. Individual instead of familial migration,
5. Absence of social integration

After 1990s, however, China's government gradually relaxed the control of this system but it still exists in a less intense way today. It is relaxed because of the large labor required by the countless export processing firms in the coastal provinces; and it is still exist because the cities simply cannot afford such a inflow of population in such a short time, there are often problems in urbanization growth, things such as insufficient public facilities, income disparity⁷.

Since China has the biggest population in the world and a relatively fixed land supply, potential unemployment is quite serious. There are 230 million people in rural areas of China which can be defined as potentially unemployed.

2.3 Previous research

Many previous researches on trade openness and its effect on urbanization concluded that there is a positive relationship between the degree of trade openness and urbanization. There are many papers and studies regarding urbanization in China and studies about trade openness in China, in which trade is found to be an engine for growth in China in general. Pannell focus on special economic zones (SEZs) and their impacts on attracting FDI to urban areas (Pannell, 2002). ENG mentioned it is the foreign investors that actually possess the key factors to local economic growth: people who possess capital and external connections contribute more to Chinese urban boom than local residents although the later are permanent residents (ENG, 1997). However, there is not much researches that directly links trade with the urbanization in China.

When reading about urbanization in China, we found that the topics appeared the most are urbanization's impact on regional income disparities, the labor market, and welfare growth and so on. J.F. BRUN metioned that the income disparity of coastal and western China has threatened the social stability, thus the central government invest much on the infrastructure of western part and effectively improved the urbanization of western China (BRUN, 2002). When researching on the reasons behind urbanization, the most common

⁷ There are many studies regarding challenges that facing Chinese urbanization growth.

answers are growth of the economy, wage disparity, open policy towards trade and deregulation. Kevin concluded that the rural-urban migration driven by income disparity is the main source of Chinese urbanization of last two decades, which in turn is the result of China's economic growth. He also mentioned that due to geographical reasons, the intra-province migration is more common than inter-province migration (Kevin, 2003).

The paper by Xiaolan Fu and V.N. Balasubramanyam (2005) tests the impact of trade on employment growth in China in 29 provinces over the time period 1987-1998. In their empirical finding they find that exports provide an effective demand on employment in China, and when they regressed the increase in employment on increase in export volume, they find a positive and significant result of 0.17%, which means that when export volume increase by 1% it increases the employment by 0.17%; and when they regress the share of urban population in total population on export growth they find a positive and significant result of 0.345 per cent, which means that a one percent increase in the export-GDP ratio raises the share of urban population in total population by 0.345 per cent.

One working paper about regional development in China tried to explain the provincial growths by measuring the influence of international trade (*Geography*) and a preferential policy index (*Policy*). And it indicated that *Geography* and *Policy* had nearly the same influence on coastal growth, however *Geography* affected growth with a longer time lag than *Policy*. And the policy here mostly represents the "deregulation policies" such as the ones mentioned in our background of this paper. They explain the reason why the Policy effect was faster is its enabled marketization and internationalization of the coastal economies, and allowed them to become more like their East Asian neighbors (and competitors) (Woo et al. 2002).

In another paper made by Michael, Seeborg, Zhenhu and Yiping (1999) a conceptual model of voluntary rural-urban migration in China was constructed, the starting point of which is Michael Todaro's model of internal migration. It points out that rural-urban migration depends on the *expected* rural-urban income differentials rather than the absolute differentials. This means that the potential migrant not only takes into account the probability of getting a job, but also the expected wage rate. In Todaro's model, first, migration can continue to exist even with high urban unemployment. If urban wages are sufficiently high, it can overcome the risk from unemployment. Second, it assumes that the migrant is forward-looking; they are rather motivated by expected income increase over time than the current income level (Kasliwal, 1995).

In contrast, one article written by Alberto and Edward (1995) actually found a negative relationship between trade openness and the size of a city. In their regression they found that a one-standard-deviation increase in the share of trade in GDP reduces the size of the capital city by about 13%. This is then consistent with Krugman's theory that when transportation is expensive activities will group together to save on travel costs. Krugman and Livas (1992) predicted that countries with high shares of trade in GDP or low tariff barriers rarely have their population concentrated in a single city. The logic behind this is protectionism. Under protection, international trades are limited, domestic goods are cheaper in the center city since firms are located in the cities. Workers flow into cities for cheaper domestic goods, as the result, protectionism generates larger cities. This is very interesting from our point of view, since we believe the relationship between trade openness and urbanization is positive.

We believe that the different findings from Alberto and Edward could be due to (1), their study sample is 5 capital cities: classical Rome, 1650 London, 1700 Edo, Buenos Aires in 1900, and Mexico City today while we focus on the eastern regions in China; (2), the driving force for their study is worker's interests in cheaper domestic goods while in our study, the huge demand for labor surplus of export industries is the main concern. (3) They are testing urbanization by *population concentration* while we test urbanization as the share of *urban population of total population*.

2.4 Theoretical framework

This section will be used to give a summary of the critical findings of earlier research, in terms of the relationship between urbanization and openness. Also, outline some general concepts that can help to understand the relationship between urbanization and trade openness.

Technology transition

One theory explains the 'restructuring processes of openness on urbanization (Clifton, 2002). Clifton mentioned increasing exports and persistent FDI provide China with abundant finance to develop its economy, while converting, or restructuring its industry structure. The lagging state-owned enterprises (SOEs) have been stimulated to allow new and productive means, so that they can absorb the labor surplus from restructured enterprises and those from the countryside: the so-called 'catching-up effect'. Openness can improve productivity by two ways in China in terms of the public sector and private sector, respectively. (ENG, 1997) (J.F. BRUNa, 2002)

- (1) The openness policy effectively increases the productivity of SOE. The setting of special economic zone in coastal cities not only attracts FDI, but also attracts scientists, research centers and other technology spillovers. Based on the 'learning curve', China's products tend to be cheaper in the long run. All this strengthens the competitiveness of 'made in China' goods and is helpful to upgrading Chinese industries. When the foreign demand increases, labor demand also increase, this absorbs more people from rural areas. (J.F. BRUNa, 2002)
- (2) The openness policy strongly encourages private enterprise development. When China established special economic zones, private small and medium enterprises (SMEs) began to have a boom in the coastal provinces. Large numbers of these SMEs provides services to the SOEs, or join in the export manufacturing later on when they grow bigger. Until the end of 2001, SMEs absorbed more than 75% of total labor in the urban area. The strong incentive from export demand, the low level of bureaucracy and flexible production make SMEs more competitive than SOEs, generating many jobs and thus accelerating urbanization. (LU, 2002)

Basically, technology transition induced by openness policy, upgraded industrial structure, launched an intensive export-led manufacturing process and an urban private sector boom.

Increasing returns and international trade

Another popular explanation of relations between openness and urbanization is increasing returns. Pual Krugman (1980) claims that scale economy can effectively decrease production cost, thus production activities tend to agglomerate. Then large scale production based on the global market gradually replaces small scale production based on

the national market. Traditional theories about international trade emphasizes that different recourses to determine the trade pattern among different countries, for example, labor abundant countries tend to export primary goods while capital abundant countries tend to export manufactured goods. However, the 'new trade theory' explains another more important phenomenon in today's international trade, that is, the trade between countries with similar resources and export goods. For example, Sweden is a country that both imports and exports automobiles (Krugman, 1980).

This kind of 'Intra-industry trade' leads to production specialization and mass production, which usually happens in costal urban areas, and remarkably decreases the price of goods and increases the diversity of goods. Therefore, more and more people are attracted to urban places. Urbanization can be seen as agglomeration of these trade-led economic activities (Krugman, 1980).

In addition, the intra-industrial trade has a self-strengthening effect. When more and more people move to the urban areas, the market of these places grows larger, thus stimulating higher income, bigger scale economy and more specialization. This in turn will attract people to urban places even more. As a result, the urbanization rate tends to continually grow. (Krugman, 1980)

In China's case, scale economy can well explain the costal urban boom. China's manufacturing goods are highly concentrated in urban areas. In Dong Guan, a coastal city near Hong Kong for example, several big factories produce more than half of the Barbie dolls selling in the world. Each of these factories hires more one thousand employees from rural areas. (Shen, 2002)

The dual sector model

The rural-urban gap in China is quite similar to the 'dual sector model' derived by S.A. Lewis (Lewis, 1954). The model describes surplus labor continually transferring from the traditional agriculture sector to the modern manufacturing sector. Because land supply is fixed, marginal output of agriculture sector tends to be zero in the long run. Thus more and more surplus workers are in the situation of potential unemployment. However, since the modern industrialized sectors are usually capital intensive, the marginal output of labor is higher than in the traditional sectors, thus the modern sectors tend to have higher wages than the traditional sectors; over time, the manufacturing sectors absorbs surplus labor and promotes industrialization and urbanization. This process will continue until potential unemployment exhausted. (Lewis, 1954)

In China's case, the dual sector is quite typical. *Hukou* system strictly limits resource free flow from different part. Given by huge population and relatively limited land supply, the potential unemployment in China is considerably high. Before economic reform, low efficiency in rural China is very common. Idle labors have nothing to do but restrict to their homeland.

With economic reform launched, especially open policy, large rural migrant workers flow into cities and work in export goods factories for higher wages. Large scale of FDI and trade continually attract people flow from traditional sector to modern sector, meanwhile bring amazing GDP growth. Thanks for huge population storage; this process tends to continue. Lowes called this "population bonus". (Lewis, 1954)

The 'vent for surplus' model

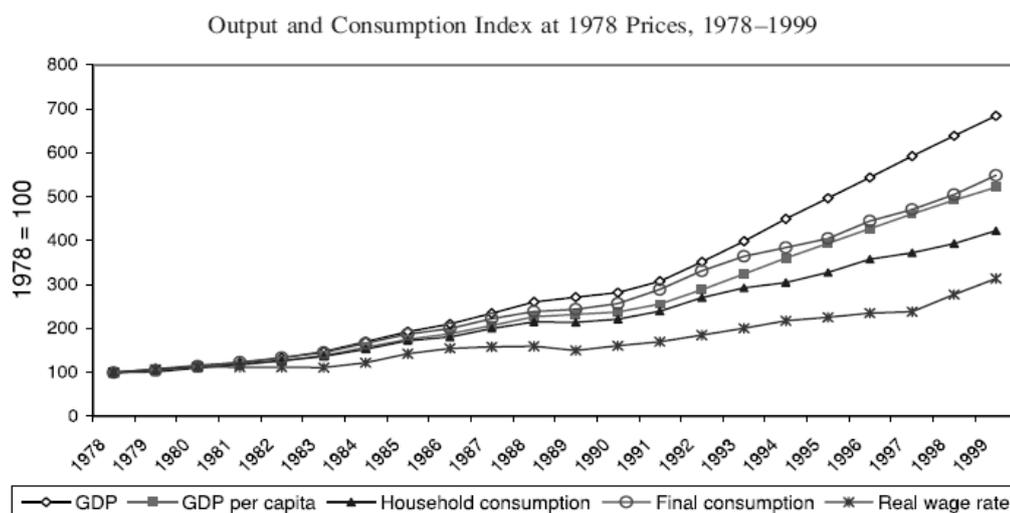
The 'vent for surplus' model effectively explains the relationship between trade and urbanization. The original theory of the effect of trade on economic growth can be traced back to Adam Smith:

"Between whatever places foreign trade is carried on, they all of them derive two distinct benefits from it. It carries out that surplus part of the produce of their land and labor for which there is no demand among them, and brings back in return for it something else for which there is a demand. It gives a value to their superfluities, by exchanging them for something, which may satisfy a part of their wants, and increase their enjoyments. By means of it, the narrowness of the home market does not hinder the division of labor in any particular branch of art or manufacture from being carried to the highest perfection. By opening a more extensive market for whatever part of the produce of their labor may exceed the home consumption, it encourages them to improve its productive powers and to augment its annual produce to the utmost, and thereby to increase the real revenue and wealth of society" (Smith, 1776, p. 413).

In Smith's view, international trade can create extra demand for domestic products. Myint has developed Smith theory further into the 'vent for surplus' (VFS) theory in 1958. According to this theory, international trade can result in further demand of the surplus resource in the economy that tends to be idle in the closed economy situation. This extra demand from trade triggered the increase of employment in those sectors, and, which in China's situation, attracted a huge amount of labor from rural areas to those manufacturing sectors (Fu & Balasubramanyam 2005).

There are a few points worth noting about VFS theory:

First, the VFS theory focused on the increased production by increased usage of existing resources but not by increased productivity growth; Second, compared to the comparative advantage theory, the VFS theory is more suitable because it assumes existence of surplus resources even before the economy is opened; Third, the reason for surplus capacity is due to the insufficient demand for the output, but not due to the supply-side factors (Fu & Balasurbramanyam 2005). As shown in the figure below, the household consumption growth is lagging behind the GDP growth.



Source: China Statistical Yearbook.

Figure 5: output and consumption index.

Source: China Statistical Yearbook.

According to the VFS thesis, the opening up of an economy to international trade and foreign direct investment will give a vent for the production of surplus resources, and this can be depicted diagrammatically.

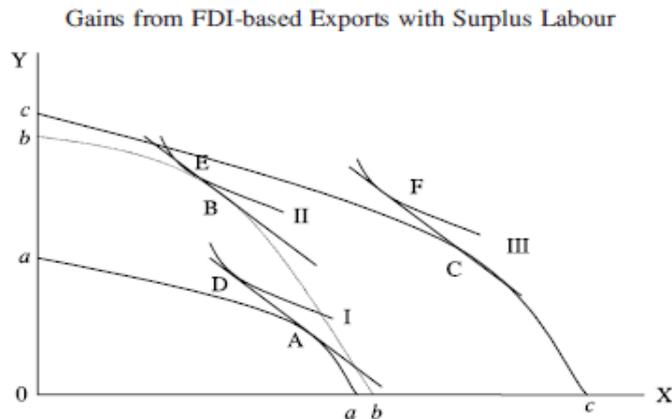


Figure 6 VFS model.

Source: Xiaolan Fu & V.N.Balasubramanyam 2005.

Assume there are two factors of production and two goods produced in the economy: Labor intensive product X, and capital intensive product Y. Given the constant returns to scale, the curve is presented as the usual bowed-out transformation curve *aa*. The economy will consume at the point D by trade. But now imagine after allow the inflows of FDI into the economy, it will increase the production of capital intensive goods which leads to the export of goods Y, and that will mean that the labor- intensive goods would decline if the same labor supply is maintained and the labor is fully employed. These changes make the curve shift outwards to *bb*, at the new production point B, the output of X decreases while that of the capital- intensive goods Y increases. However, when there is surplus labor in the economy, the FDI will actually use the labor to produce more goods for export purpose, therefore the exports enable the curve to shift further outside to *cc*, and reaching another new production point C, and note, this is not caused by the increase of productivity of labor, but simply of employing more labor in production. So finally the economy will consume at point F, where the economy produces a lot more labor-intensive product X comparing to the starting point, and a little higher production of capital- intensive product Y (Fu & Balasurbramanyam 2005).

So the question here is whether ‘vent for surpluses is suitable for explaining the export growth and urbanization growth in China.

According to Myint’s (1958) explanation for the ‘vent for surplus’ theory, the constraint for exports to act as a ‘vent for surplus’ is the existence of surplus productivity and an inelastic domestic demand for the goods it can produce. Especially in a developing country, such a surplus may be cause by an imbalance of its production ability and its consumption activities. By applying the VFS theory Fu & Balasubramanyam (2005) state that exports not only provided an effective demand for China’s surplus capacity, but also for its surplus labor. The empirical tests done in that paper suggest that, assisted by FDI and the TVEs

(township and village enterprises), exports, these 3 independent variables have successfully provided an effective vent for the surplus productive capacity and labor. Because the export growth has created a tremendous number of new job positions in a country with a large volume of unemployed labor. Also the export expansion within the labor-intensive manufacturing industries has encouraged the growth of industrial output and attracted a huge amount of labor to transfer from agricultural sector to join the non-agricultural sector; all these reasons together accelerated the urbanization and industrialization in the Chinese economy.

So generally speaking, technology transition and increasing returns are often used to explain the relations between trade and urbanization; the theory can be traced from classic economic growth theory or industrial organization theory. However in our opinion dual sector model and vent for surplus model are more suitable in explaining urbanization in China, since they take into account some of China's important features: the large population and the gap between rural and urban regions.

3 Descriptive statistics

In this section we aim to compare how China's regions differ from each other in the terms of urbanization and trade openness between the year 2000 and 2006.

3.1 Regions' urbanization rate

Generally speaking in east of China urbanization growth is more obvious; urbanization between east and west of China is more different; between north and south is more even (see table 1 below).

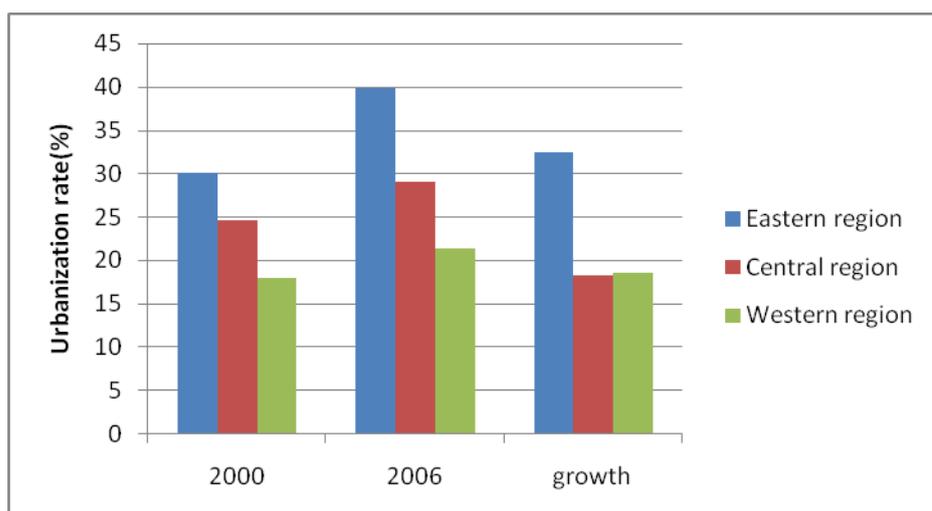


Table 1 Urbanization rate comparison between different regions in China.

Source: made by the authors, data from National Statistic Bureau of China.

In north-east of China regions, for both years 2000 and 2006 Beijing's urbanization rate is amount the highest, within seven years it increased by 40.88%⁸, then comes Wuhan province, which within seven years has grown by 12.98%, next it is Tianjing, which has grown 12.30% in seven years, while the slowest growth remains in Liaoning and Guanzhong, they have grown only 2.34% and 0.42% respectively.

Among the regions in east of China, Shanghai's urbanization rate is the highest. In 2000 it climbed to 75.6% while the lowest urbanization rate 19.6% occurred in Anhui. Till year 2006 Shanghai had already reached a even higher level of urbanization 85.76% and Anhui remained the last one on the list at 21.74%, the difference of urbanization level for Shanghai and Anhui worsened over the years. This could be explained that Shanghai as the financial center of China has grown rapidly in different aspect of its economy, such as financial industry, service industry, together with its small amount of labor working in agriculture, its urbanization rate can be shoot up easily; while Anhui province, the mainly agriculture oriented province, has a large amount of labor working as famers, and its economy is much weaker compared to Shanghai.

South of China, especially Guangdong province, its GDP highly related to the whole nation's GDP value. After entering the 21th century, Guangdong province's economy has

⁸ See complete data in Appendix.

grown rapidly. According to the statistic bureau in year 2006 Guangdong's GDP takes 1/8 of China's total GDP. At the same time Guangdong's urbanization rate has also grown simultaneously. In 2000 its urban/total population ratio was only 31.18% while in 2006, seven years later, it was 51.55%; within seven years it had increased by 20%. While the second province, Hainan, urban ratio had grown by 12.96%; the third province Guangxi had the slowest growth in urban population, within seven years it grew only 2.41%.

Central of China's four provinces is relatively slow in growth comparing to the south, it is mainly due to the geographic factor and their population are largely remind in rural area as farmers. For example Hubei province, as the highest in urban ration had only 27.97% in 2000, while the same year for Henan is only 18.2%. After seven years in 2007 Hubei had grown over 30% in urban population ratio, while all the other three provinces were still remind fewer than 30%.

In south west of China, Chongqing and Sichuan were the leading provinces, no matter in 2000 or 2006, their urban ratio were always leading among the others. One of the reasons for their growth in urban ratio is both these two provinces had received more government support during these years, especially Chongqing. Other than that the government had also helped to develop the cities and rural areas. Yunnan province on the other hand was the slowest in the group in urban population growth; within seven years it grew by only 1.09%.

In north east China, all three provinces had grown evenly and steadily during the seven years. From the figures we can see that the provinces have not grown significantly as the other part of China, however, their people's living standards have grown.

3.2 Regions' trade openness

China's regional trade growth are heavily dependent on geography, basically the closer to the sea, the higher trade openness it is; and the degree of trade openness decreases from east to central to west (see table 2 below).

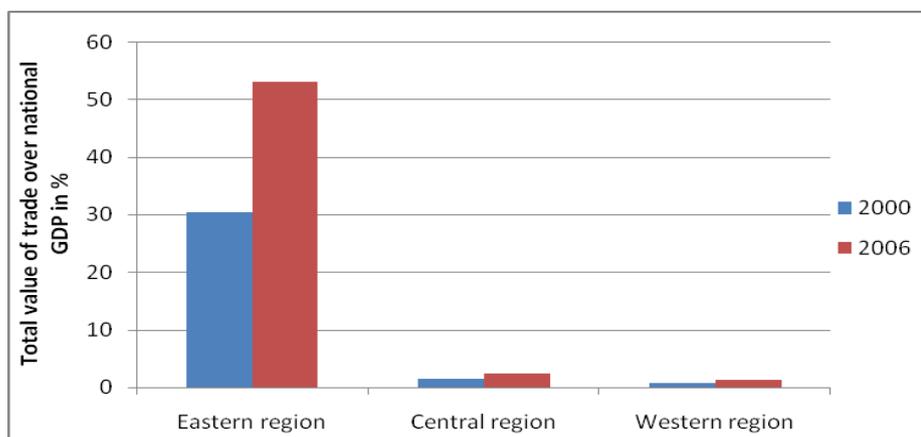


Table 2: compare trade openness in different regions in China.

Source: made by the authors, data from National Statistic Bureau of China.

More specifically, low transportation cost, closeness to Japan, Hong Kong and South Korea are the primary geographical factors. Besides, there are two non-geographical reasons are also important:

(1) Strong support policies. As mentioned above, Chinese government set several special economic zones (SEZs). They are all located at coastal provinces, or east economic area.

Within these SEZs, international trade enjoys substantial tax cut and more highly efficient government service. More transparent business law provides much better investment environment than inland provinces.

(2) People have international trade tradition. China is historically an agriculture nation, people have long nature economy tradition. The institutions, technology and even people's mind are more inwardly oriented. However, since late 19th century, people living in coastal provinces gradually accepted business concept from the West and become more familiar with international trade. These people have more open minded and get rich from the trade with foreigners. So after the communist government decided to convert from closed economy into an open economy, people from coastal provinces are more easily to adapt and get use to the new situation.

As expected, the total value of import and export is very different between regions (see table 2 in Appendix), such that in year 2000, the total value of trade for eastern region is almost 22 times as much as the total value of trade in Central region, while the later is twice of the Western region; and in year 2006 that gap has deepened even more between them. In Eastern region, almost all the provinces' total value of trade is 7digits (as measured in 10,000 US dollars) or more except province Hebei, Inner Mongolia, Guangxi and Hainan, which has only 6 digits, and they are rated as developing or underdeveloped by Chinese measures, moreover, the low living standards in these provinces and lack of basic infrastructure restricted their potential for attracting foreign investors. On the contrast, Guangdong province is the only province stands out in the Eastern region with a 8 digits number of total trade.

As we can see for the Central region, all the provinces are not so different in the value of total trade, all have 6 digit numbers, while Anhui has the highest of 334,684 and Jiangxi has the lowest 162,405 in year 2000. And six years later in 2006, there are three provinces from Central region reached 7 digits and they are Anhui, Heilongjiang and Hubei.

In the Western region, which has the lowest population in China, and the geographical feature of the land is less suitable for residents, within all nine provinces in this region five of them are rated under developed in Chinese measures. So as expected, the total value of trade is much less than the other part of China; for example in year 2000 all the provinces in the Western region the total value in trade is equal or less than 6 digits, the highest being Sichuan 254,520 and the lowest being Tibet 13,031, and in year 2006; although there are positive improvements in the numbers, however still far from reaching the other regions.

4 Empirical Analysis

In this section we will present a series of regression analysis on our hypothesis question, that is if trade openness has a positive impact on urbanization, by using the supporting theories from the theoretical framework section.

4.1 Data and Methodology

A set of panel data analysis are applied here to test our hypothesis. A panel data is a data set that combines both time series and cross section data, since our data only covers 6 provinces in China, it is more likely to be a time-series and cross section data rather than a typical panel data. The reason for us to use both cross section and time series data in this case is because, firstly, it can give more informative data and more variability; secondly, there will be less co-linearity between the variables but more degrees of freedom and more efficiency; thirdly, time-series and cross section data is better suited in this situation to describe the dynamics of change (Gujarati, 2003).

Our data sample was drawn from the local province's Statistic Bureau and the National Statistic Bureau of China. At the beginning, the purpose of this paper is to make an empirical study on 10 eastern provinces of China: *The six coastal provinces*: Hebei, Shandong, Jiangsu, Zhejiang, Fujian, Guangdong, and Hainan plus *the metropolises* of Beijing, Tianjin, and Shanghai from within the period of 1978 to 2007. However we are only able to find sufficient data for 6 provinces and the time range is limited from 1987 to 2005. Therefore it is possible that the results presented below may be subjected to sample bias; however, across the 6 provinces there are great differences in population size, landscape, industry, GDP per capita, trade openness and so on, therefore the results generated from this sample should reflect the results that could obtained from the population, i.e. if all the data is available for all the provinces in Eastern China.

Therefore, based on our theoretical framework, the research hypothesis for this thesis is:

H₁: *trade openness has a positive effect on urbanization, which is the urbanization rate is higher in the provinces that have higher degree of trade openness.*

H₀: *trade openness has no effect on urbanization; trade openness has negative effect on urbanization.*

4.2 Empirical findings

In this section we will introduce the models that are designed to test our research hypothesis. Different regression models are used, different explanatory variables are tested, and the results and analysis for the panel data sample are presented.

All of our four regression models share 3 features, first, since the dependent variable urbanization rate is a level measure, we must make all the other variables into level measures as well, therefore we divide all the explanatory variable by GDP before we test them, for example, the explanatory variable trade openness is actually the total value of import and export over GDP, and the variable FDI is actually FDI over GDP, and the same goes to variable WAGE; the next feature of all the models is that we put Log on all the variables in the regression, and that is because it is easier to analyse the result, since after putting Log on the variables, the result will show exactly how urbanization rate change in % regarding to 1% change in the explanatory variables; the third feature is that

all the models are tested by the Cochrane-Orcutt procedure (AR(1)) model to eliminate autocorrelation problem.

4.2.1 (AR (1)) model 1

From the theory, we designed model 1 to explain the variation in dependent variable urbanization rate with the provinces total value of trade over GDP, their FDI value over GDP and the average wage over GDP of the provinces over the whole period of 1987 till 2005, in this model region Shanghai is excluded due to data for FDI is not available for Shanghai.

$$\text{Log}(UR_{pop})_{it} = \beta_1 + \beta_2 \text{Log}(\text{TRADE})_{it} + \beta_3 (\text{Log}(\text{WAGE})_{it}) + \beta_4 \text{Log}(\text{FDI}) + u_{it}$$

The results for model 1 are shown below:

Variables	Coefficient	Std. Error	t- statistic	P-value
Constant	6.168882	0.0560443	110.07	0.0000**
Log(TRADE/GDP)	0.1295401	0.0370494	3.50	0.001**
Log(FDI/GDP)	-0.0059323	0.011704	-0.51	0.614
Log(WAGE/GDP)	0.0493031	0.0676278	0.73	0.468

Table 3 Result for model 1

Dependent variable: Log (UR_POP)

Number of observations: 90

R²=0.5359 Prob. (F-statistic) =

0.000000**

From the results we can see that, the independent variable Trade as expected has a positive effect on urbanization, which means that when Trade increase one percent it increases the urbanization rate by 0.13% approximately. And the variable Wage shows a small value for its slope coefficient however insignificant; FDI variable shows a negative effect, unexpected, but we assume that it is due to the correlation between FDI and Trade, therefore we will exclude FDI variable for the rest of regression models.

4.2.2 Models with policy control (Hukou policy)

In model 2 we basically run the same regression as in model 1, however, this time we only take into account samples after year 1990, which is after the Hukou policy been relaxed, since we believe that this policy change could be one influencing factor that changed urbanization. Therefore in this model the number of observation has reduced to 70, that is 6 provinces and 12 years. The results for this model are shown below:

Variables	Coefficient	Std. Error	t- statistic	P-value
Constant	5.246773	0.1036227	50.63	0.0000**
LOG(TRADE/GDP)	0.1532475	0.0407293	3.76	0.0000**
LOG(WAGE/GDP)	0.1112055	0.0966735	1.15	-0.081981

Table 4 Results for model 2 (after year 1990)

Dependent variable: Log (UR_POP)

Number of observations: 70
0.000000**

R²=0.3864 Prob. (F-statistic) =

As we can see from the results, although the value of R-square is very small comparing to the former model, the variables are still significant at 1% level except for wage. So according to this model we can say that after year 1990, one percent rise in Trade will increase the urbanization rate by 0.15%.

After proven that when the Hukou policy is relaxed, the higher the trade openness the higher the urbanization rate there is, we also need to test on the years that before the policy change, therefore we run the same test again, however this time we include samples only before 1990. And the results are shown below:

Variables	Coefficient	Std. Error	t- statistic	P-value
Constant	4.925435	1.534741	3.21	0.049
LOG(TRADE/GDP)	-0.1738144	0.1452645	-1.20	0.317
LOG(WAGE/GDP)	0.4041657	0.3284862	1.23	0.306

Table 5 Results for model 2 (before year 1990)

Dependent variable: Log (UR_POP)

Number of observations: 10
0.2994

R²=0.6637 Prob. (F-statistic) =

From the result we can see that model 2 (before 1990) is not significant, one of the reason could be that we have too little observation, 10 observations in a time-series and cross section data analysis is far too little to have any significant result. In order to increase the number of observation in the meantime test the model with control to policy change we designed model 3:

$$\begin{aligned} \text{Log}(\text{UR}_{\text{pop}})_{it} = & \beta_1 + \beta_2 \text{Log}(\text{TRADE})_{it} + \beta_3 \text{Log}(\text{WAGE}_{it}) \\ & + \beta_4 (\text{Log}(\text{TRADE}_{\text{POLICY}}) + \beta_5 \text{Log}(\text{WAGE}_{\text{POLICY}}) + u_{it} \end{aligned}$$

The two new variables are defined as:

Log (Trade-Policy) = Log (Trade)*Policy-Change;

Log (Wage-Policy) = Log (Wage)*Policy-Change;

And Policy-Change=1 if year >1990.

The results for this model are shown below:

Variables	Coefficient	Std. Error	t- statistic	P-value
Constant	6.285183	0.0590424	106.45	0.000**
Log(TRADE/GDP)	0.1281328	0.0390644	3.28	0.002**
Log(WAGE/GDP)	0.0378646	0.0685322	0.55	0.582
Log(Trade-Policy)	0.0076864	0.0213483	0.36	0.720

Log(Wage-Policy)	-0.0094252	0.0167204	-0.56	0.575
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Table 6 Result for model 3

Dependent variable: Log (UR_POP)

Number of observations: 90

R²=0.5181

Prob.

(F-statistic) = 0.0000**

Model 3 is much reliable comparing to model 2, since it does not only have a higher observation number; it is also a significant model that has a rather reasonable R-square value. Even though the result for variable Trade is still quite similar with the other models, that when Trade increase one percent the urbanization rate will increase by 0.13% approximately. Since the policy variables are not significant in the result, we cannot reject the null hypothesis that their effect on urbanization is zero.

4.2.3 Model with policy control (the return of Hong Kong)

As we recall figure 5 in the background section, the growth of total trade in China shows a steeper growth rate after 1997, that is when China took power of Hong Kong again after Britain's colonization of 100 years in HK. So since the graph shows that this event has a great influence on the total value of trade in China, we are wondering if this event also has an influence on our research problem, that we will test in model 4:

$$\text{Log}(UR_{pop}) = \beta_1 + \beta_2 \text{Log}(TRADE)_{it} + \beta_3 \text{Log}(WAGE)_{it} + \beta_4 (\text{Log}(TRADE)_{POLICY}) + \beta_5 \text{Log}(WAGE)_{POLICY} + u_{it}$$

This model is basically the same as in model 3, the only change is Policy-Change =1 when years > 1997. And the results are below:

Variables	Coefficient	Std. Error	t- statistic	P-value
Constant	6.01716	0.0581795	103.42	0.000**
Log(TRADE/GDP)	0.116153	0.0363598	3.19	0.002**
Log(WAGE/GDP)	0.0673625	0.0645088	1.04	0.299
Log(Trade-Policy)	0.0273933	0.019205	1.43	0.158
Log(Wage-Policy)	-0.0212461	0.0156347	-1.36	0.178

Table 7 Results for model 4

Dependent variable: Log (UR_POP)

Number of observations: 90

R²=0.4945

Prob.

(F-statistic) = 0.0000**

As expected, even when we changed the policy control, the result for variable Trade is still positive and significant, this time the results show that every one percent increase in Trade will increase urbanization rate by 0.12% approximately. Once again, the policy variables and the Wage variable are in-significant.

4.3 Summary of the empirical results

To summarize our empirical analysis, we compare the results from all four regression models: In model 1 we run the regression in all the years from 1987 to 2005 on all 5

provinces, the results came as expected, Trade has a positive effect on urbanization rate and the result is significant at 1% level, variable Wage also showed a positive effect however insignificant, the unexpected result in model 1 is that the variable FDI shows a negative relationship to urbanization rate however insignificant, we believe that is the result of correlation before trade and FDI, therefore in the later models we excluded FDI variable from the regression.

After comparing the results using different regression models, we also wondering if the policy change during the time period has any effect on urbanization, therefore we included variables to capture the change of Hukou policy, before and after relaxation of that policy in 1990. We tested the model in two different time range, before and after 1990, however since from 1987 to 1990 is only 3 years time, model 2 (before 1990) is insignificant, and cannot be relied on. After model 2 being insignificant, in model 3 we added two more variables as dummy variables to describe the change of policy instead, and the results of that model are significant and positive, however do not show any strong difference from model 1. The last model we used is aimed to test the influence of politic, after HK became part of China in 1997, and to see if that change the relationship of trade and urbanization. Results come out as expected, still significant and positive for variable Trade, not strong relationship with either Wage or any policy variables.

So to sum up our empirical work, the value for the slope coefficient of Trade variable is approximately 13% in all 4 models and significant at 1% level, which means that we cannot reject the null hypothesis:

H₁: *trade openness has a positive effect on urbanization that is the urbanization rate is higher in the provinces that have higher degree of trade openness.*

which means that we can confirm our theory, trade openness has a positive effect on urbanization rate in Eastern China. And if we recall the previous research section in our thesis, the result from our empirical analysis is closely linked with one of the paper made by Xiaolan Fu & V.N.Balasubramanyam in 2005, in their findings it showed that when export volume increase by 1% it increases urban population over total population by 0.17%, and that number is very close to our result of 0.13%, and when they regress the urban population in total population on export over GDP growth, they find another positive and significant result of 0.345%. Even though in their study they focused on export and we focused on trade, the similar results of the two have proven that, despite how one defines trade openness, with export volume or total value of import and export, it all has a positive effect on urbanization in China.

5 Conclusion and suggestions for further research

As stated previously, the purpose of this paper is to analyze the effect of trade openness on urbanization progress in eastern China regions over the period of 1987-2005.

After the empirical analysis, three of the regression models' results show that the effect of trade openness on urbanization is statistically significant and positive.

To conclude, we can state that China's opening up to the rest of the world has not only benefited its economic growth, but also increased the urbanization step, by changing a huge agriculture oriented nation into a fast growing industrialized nation. About 20 to 30 years ago, pictures or films about China show Chinese people working in farms with bear feet and funny hats. Now you can go to any store in the rest of the world and see products marked with "Made in China" sign, and when you go to China you see forests of skylines that filled with people living in cities. As the rest of the world is becoming more familiar with everyday products that are made in China, Chinese cities are getting bigger and bigger every day.

For the future research we would like to suggest an analysis of the influence of urbanization on trade in return, since when the urban population keeps growing it will cause the wage level in urban areas to go up they can decrease the demand of labor and will that decrease the trade since it will increase the price of the export goods. Also it is interesting to know why the migration and FDI do not happen in the interior where the wages are much lower. So this could also be an analysis that is worth studying. Furthermore, there are so many other aspects that influence urbanization, such as income disparity growth, pollution and lack of infrastructure in the urban area. One cannot help wondering how the Chinese economy can cope with all these side effects of urbanization. We would also suggest future research that can help find answers to these problems.

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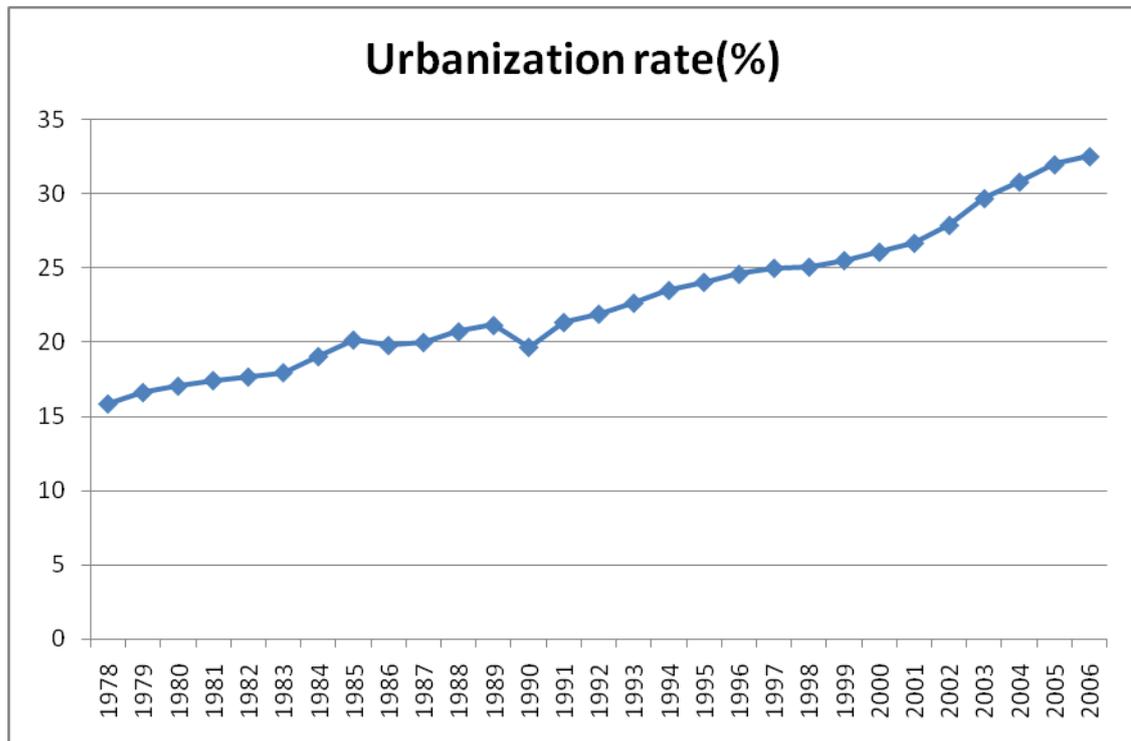
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<http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/index.aspx>

Appendix

Figure 7 Urbanization rate in China since 1978 open policy



Source: Made by the author, data from National Statistic Bureau of China.

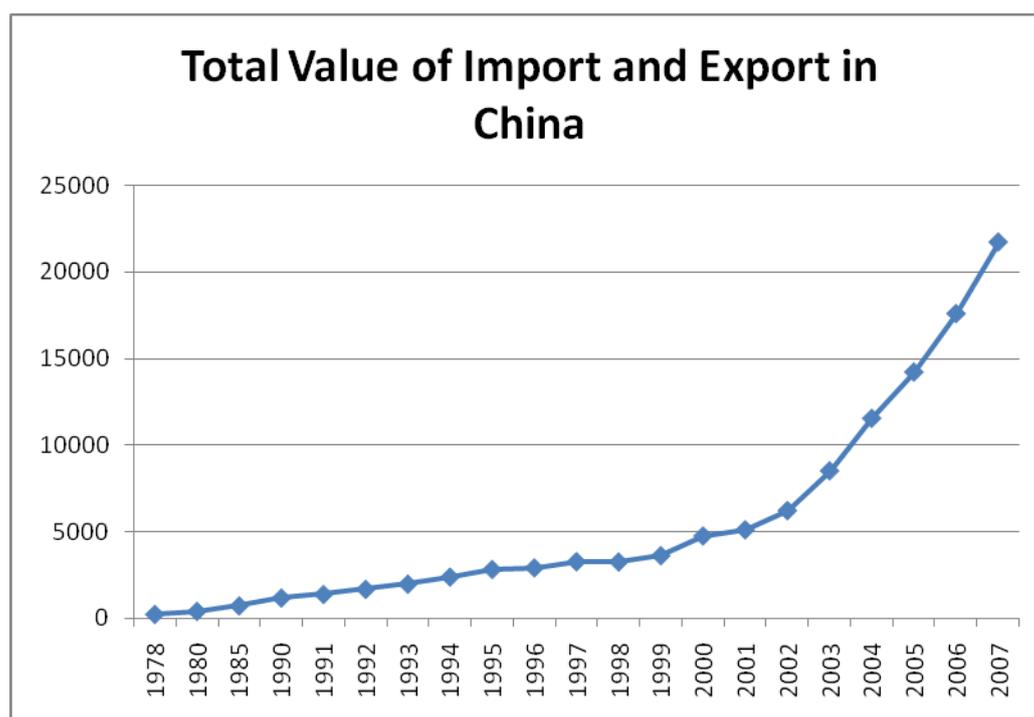
Table 8 Urbanization rate comparison between regions

Region	2000			2006		
	Total Population	Urban. Population	Urbanization rate(%)	Total Population	Urban Population	Urbanization rate(%)
<i>Eastern Area</i>	532947656	160246210	30.07	555471445	221146787	39.81
Beijing	11135263	7628441	68.51	11999644	9071247	75.6
Tianjing	9187106	5357359	58.31	9522793	5722106	60.09
Hebei	66709293	13074799	19.6	69391195	21085375	30.39
Inner Mongolia	23009464	8117317	35.28	23823190	9526728	39.99
Liaoning	41353441	19022387	46	42103533	20567693	48.85
Shanghai	13216324	9861631	74.62	13680827	11732999	85.76
Jiangsu	70692774	22721549	32.14	73177234	32513853	44.43
Zhejiang	45012159	9950214	22.11	46294293	13121653	28.34

Fujian	33046317	6809413	20.61	34091491	10927501	32.05
Shandong	89754623	24096280	26.85	92823490	32277326	34.77
Guangdong	74985404	23382850	31.18	80487106	41494202	51.55
Guangxi	47236100	8255282	17.48	49742291	9892493	19.89
Hainan	7609388	1968688	25.87	8334358	3213611	38.56
Central Area	416160170	102405355	24.61	438805645	127838484	29.13
Shanxi	31961794	8618371	26.96	33398833	10471499	31.35
Jilin	23009464	8117317	35.28	26795123	12087788	45.11
Heilongjiang	36981063	16919341	45.75	37918076	18303552	48.27
Anhui	62783538	12303386	19.6	65934505	14332211	21.74
Jiangxi	41644693	9410159	22.6	44570876	11787535	26.45
Henan	95265066	17335027	18.2	101791037	21687626	21.31
Hubei	59359897	16605599	27.97	60383824	23399866	38.75
Hunan	65154655	13096155	20.1	68013371	15768407	23.18
Western Area	241833740	43610528	18.03	255577295	54610953	21.37
Sichuan	84074705	15650237	18.61	87225224	20707826	23.74
Guizhou	36766337	5316494	14.46	39219102	6268277	15.98
Yunnan	40766183	6310503	15.48	43157489	7152616	16.57
Tibet	2512341	352928	14.05	2685806	440073	16.39
Shaanxi	35721681	8157343	22.84	37385759	10107815	27.04
Gansu	25336508	4869775	19.22	26132473	6219734	23.8
Qinghai	4804160	1360945	28.33	5103464	1527231	29.93
Ningxia	5543214	1592268	28.72	6007671	2187338	36.41
Xinjiang	6308611	35.21	5.58126E-06	8660307	43.37	5.008E-06

Source: Made by the author, data from National Statistic Bureau of China

Figure 8 Total value of import and export in China from 1978 to 2007



Source: Made by the author, data from National Statistic Bureau of China.

Table 9 Comparison between regions of total value of Trade

Region	Total Value 10,000\$ in 2000		Total Value 10,000\$ in 2006		Growth in %	
	IM+EX	EX	IM+EX	EX	IM+EX	EX
<i>Eastern Area</i>	44147579	22933672	164061101	89640322	2,716197	2,90868
Beijing	4962189	1196813	15803663	3795398	2,18482	2,17125
Tianjing	1715400	862578	6446194	3349078	2,75784	2,88264
Hebei	523862	371000	1853088	1283400	2,53736	2,45930
Inner Mongolia	262205	97017	596082	214050	1,27334	1,20632
Liaoning	1903148	1085632	4839024	2831942	1,54264	1,60856
Shanghai	5470802	2535233	22752420	11358927	3,15888	3,48043
Jiangsu	4563636	2576683	28397838	16040962	5,22263	5,22543
Zhejiang	2783262	1944275	13914161	10089056	3,99923	4,18911
Fujian	2122046	1290607	6265963	4126174	1,95279	2,19708
Shandong	2498976	1552884	9521381	5859834	2,81011	2,77352
Guangdong	17009888	9191770	52719910	30194643	2,09937	2,28497
Guangxi	203379	148891	666756	359297	2,27839	1,41316
Hainan	128786	80289	284621	137562	1,21003	0,71334
<i>Central</i>	2031004	1239831	7474670	4414984	2,68028	2,56096

<i>Area</i>						
Shanxi	176438	123687	662710	413963	2,75605	2,34686
Jilin	257042	125683	791404	299665	2,07889	1,38429
Heilongjiang	298637	145118	1285655	843595	3,30507	4,81317
Anhui	334684	217198	1224514	683775	2,65872	2,14816
Jiangxi	162405	119741	619486	375302	2,81445	2,13428
Henan	228290	149578	979457	663440	3,29041	3,43541
Hubei	322286	193555	1176219	626063	2,64961	2,23455
Hunan	251222	165271	735226	509182	1,92660	2,08089
<i>Western Area</i>	1072455	647186	3956908	2503152	2,68958	2,86775
Sichuan	254520	139437	1102082	662412	3,33004	3,75062
Guizhou	65998	42056	161771	103843	1,45115	1,46917
Yunnan	181276	117509	622484	339149	2,43390	1,88616
Tibet	13031	11334	32838	22222	1,51996	0,96063
Shaanxi	214008	131005	536029	362961	1,50471	1,77059
Gansu	56953	41495	382493	150960	5,71594	2,63803
Qinghai	15973	11200	65172	53420	3,08016	3,76964
Ningxia	44292	32737	143713	94262	2,24466	1,87938
Xinjiang	226404	120413	910327	713923	3,02081	4,92895

Source: Made by the authors, data from National Statistic Bureau of China.