Forms of Internal Migration and Combined Effects on Regional Urban Structure in the Yangtze River Delta Area in China

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Abstract

Metropolitan Shanghai and Yangtze River Delta Area (YRDA) is undoubtedly the leading economic region in China, and it has become one of the most important population congregation areas. It is also widely considered as the sixth urban agglomeration in the world. Based on quantitative studies of the basic socioeconomic and demographic profile of population size, fertility transition, ageing, human resources and other factors, the author concludes that migration is the most important aspect of the population dynamics in YRDA. The paper studies two important forms of internal migration. First, it analyses the migration from outside YRDA into YRDA, or from inside YRDA to outside YRDA. Second, it analyses the migrations among different cities within YRDA. The paper explores how both forms of migration jointly influence the population distribution among cities, and determine changes of the urban structure. Furthermore, the paper makes a demographic projection of the future evolution of the urban agglomeration in YRDA based on estimates of urban specific fertility, mortality, and net migration. With projections of an urban agglomeration and five urban groups within YRDA, the author suggests that it is necessary to take a migration-led development strategy in YRDA within the context of the national population redistribution and regional development. It should strike a good balance between migration and regional sustainability, and it should push institutional reforms for adjusting and managing migrations in YRDA. Furthermore, the author suggests that differential development strategies should be advocated for different cities within YRDA, and it is necessary to strengthen regional coordination system for achieving an integrated regional development strategy in the area.

Introduction

Industrial development provides the impetus for urbanization and the evolution of urban structure in a region, and this process is always accompanied by migration. With the manufacturing part of the global industrial chains moving to east China, it brings along a rapid industrialization and urbanization process, and it causes great amount of labor migrating from middle and western part of China to the eastern coastal area. It is estimated that the floating population in mainland China is above 140 million in 2004, and we should note that of them, most are actual permanent migrants as they have stable job and long-term residence in the cities.

Metropolitan Shanghai and Yangtze River Delta Area (YRDA) is undoubtedly the leading economic region in China, and it is one of the most important population congregation areas. It is also regarded to be the sixth largest urban agglomeration in the world. The dynamics of internal migration and its future evolution will deeply influence urban structure, and it will also have deep influence on national development. So what does the internal migration pattern look like? And what is the relationship between population dynamics and evolution of regional urban structure in the long run? Those questions need to be studied to better understand future regional development in YRDA and to suggest suitable policies for the area.

1. Basic Socioeconomic and Demographic Profile in YRDA

1.1 Geographic Location of Yangtze River Delta Area

The Yangtze River Delta Area (YRDA) lies in the lower reaches of Yangtze River and the estuary coastal areas. There are different perspectives on the boundary of YRDA. According to the viewpoint of natural geography, YRDA is shaped with sand sedimentation in Yangtze River. Its west side is near Zhenjiang and Yangzhou, and it spreads eastward. However, YRDA defined in our research is based on views of economic geographic studies.

Pioneering studies on locational definition of YRDA were conducted by Luo (1982) proposed the concept of Yangtze River Delta Economic Zone, suggesting a vague geographic boundary using Shanghai as the core area with surrounding big cities and

small towns along the two railways of Shanghai-Nanjing and Shanghai-Hangzhou as periphery. Yangtze River Delta Economic Collaboration Association (YRDECA) covers 16 cities. These 16 cities include Shanghai, 8 cities in southeast Jiangsu Province, and 7 cities in northeast Zhejiang Province. This definition establishes a much clear boundary of YRDA for quantitative studies[1]. Some scholars emphasize that a clear definition of the boundary of YRDA is very necessary, while others suggest that YRDA is a dynamic and expandable concept, and its scale is determined by close economic linkages. They believe that in the wake of transportation development and closer economic collaborations among cities, YRDA will extend to a wider scale, so that it might include even An'hui Province, Jiang'xi Province, etc[2]. Partly because of convenience for collecting data, some scholars define the YRDA as the area including Shanghai, Jiang'su Province and Zhe'jiang Province (Zhang 2003). However, others have pointed out that the northern part of Jiang'su Province, and southern and western Part of Zhe'jiang Province actually have weak economic cohesion with Shanghai Area so far. Cang (2003) suggests that it is better to define Shanghai, Jiang'su Province, Zhe'jiang Province and An'hui Province as YRDA. Based on regional labor market studies, Zuo (2004) suggests that the spatial scale of YRDA needs to cover Shanghai, Jiang'su Province, Zhe'jiang Province, An'hui Province, and Jiang'xi Province. A much wider definition is the so-called Pan-Yantze River Delta Area which includes 7 provinces and 2 Municipalities[3]. On the other hand, Xu (2004) provides a definition of a much smaller YRDA, including Tai Lake Area, Hangzhou Gulf Area and Shanghai. These are core areas of close proximity and serve as the engine for regional development. In general, there are different geographic definitions on YRDA. According to economic integration and conventional acceptance, the YRDA boundary in our research is based on the YRDECA-defined location.

1.2 Socioeconomic and Demographic Profile

YRDA is located in the hub of globalization and regional development, and it has become a prosperous international manufacturing base in eastern China. It is fully

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[1] Actually the YRDECA is also extendable, that Taizhou City in Zhejiang applied to join in the association in 2003 and was approved, there are 16 membership for the regional economic collaboration association heretofore.
[2] Refer to Tan (2003).
[3] Those are Shanghai, Chongqing, Jiangsu Province, Zhejiang Province, Anhui Province, Jianxi Province, Hubei Province, Hunan Province and Sichuan Province.

utilizing its deep economic hinterland of whole Yangtze River Drainage Area. YRDA is undoubtedly serving as a dominant economic engine for the whole China's development. YRDA has 109.5 thousand square kilometers, constituting 1.1% of the total land of whole China. The total household registered population (*hukou* population) of YRDA was 81.2 million in 2002, constituting 6.3% of total china's population. In 2003, the Total GDP in YRDA was more than 3 trillion US dollars, 20.4% of whole China's GDP. Its GDP per capita is 4000 US dollars, 3.3 times of the average of per capita GDP of China. Inside this area, Shanghai's GDP is more than 800 billion US dollars, ranking as the topmost economic region in China. Meanwhile annual GDP of cities of Suzhou, Hangzhou, Ningbo, Nanjing are all above or near 200 billion US dollars, thus occupying leading positions in China. There are 10 cities within YRDA that rank among top 35 in China; 8 counties in YRDA are within top 10 in China; 50 counties in YRDA are within top 100 in China.

There are some typical characteristics in demographic profile in YRDA compare to other regions in China. First, YRDA is an area containing a large population. Although *hukou* population is 80.5 million in 2000, the census data shows that at the permanent population in that year was 87.4 million[1]. 47.5% of the population lives in South East Jiang'su Province, 44.7% living in North East Zhe'jiang Province, and 18.8% living in Shanghai. The population density in YRDA is 797 people per square kilometers, which is 6 times the average population density in China. While Shanghai's population density is much higher, at 2,588 people per square kilometers, it is almost 20 times of the average in China.

(Table-1 about here)

Second, YRDA is the earliest place to have accomplished population transition to enter the phase of "Low Fertility, Low Mortality and Low Natural Increase" in early 1980s. Shanghai has completed the transition as early as 1970s. By comparison, China

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[1] Due to the existent household registration system in China, household population has big difference with permanent population. Permanent Population is defined as people reside in one place more than half year. Household Population migration is much caused by policy migration and is measured by place of household registration, while permanent population migration is measured by resident place and economic activities. It is widely recommended to use this permanent population and its measured migration process in China regional studies. Refer to Ren and Wang (2003)

has accomplished the population transition since late 1990s. The fertility rate has fallen below replacement rate, so that the natural rate of growth of population has reached almost zero in YRDA. However, the fertility rate and population growth rate are comparatively higher in Zhe'jiang province than other areas in YRDA.

(Table-2 about here)

Third, besides the earlier accomplishment of low fertility, YRDA is also the area experiencing a fast population ageing process. The ageing ratio in Yangtze river is 9.94%, higher than the national average, which is around 7%. Shanghai's ageing ratio is as high as 11.4%. Observing the population pyramid, we see that the population is dwindling at bottom because of the decreasing number of new babies, while the population at top is expanding because of longevity. It is estimated that the peak of ageing in YRDA will occur in 2020, which is 10 years earlier than the ageing peak to occur in China as a whole. Meanwhile, the proportion of labor age population will peak around 2008 in YRDA, and it will start decreasing since then. This turnaround will occur 8 years earlier than in China as a whole.

(Table-3 about here)
(Figure-1 about here)

Except for Shanghai, those cities with a high GDP and a much rapid economic growth, including Nanjing, Suzhou, Wuxi, Changzhou, Hangzhou and Ningbo, have lower ageing ratio. However, as for comparatively less developed and less industrialized cities, such as Nantong and Taiizhou, their ageing ratio is much higher than the average ratio in YRDA. It shows that besides natural population increase, the ageing ratio of YRDA is strongly influenced by replacement migration. Young immigrants increase the proportion of labor age population and correspondingly reduce the ageing ratio in the area.

Fourth, YRDA has a comparatively higher level of human capital accumulation. The proportion of population with college degree and above is 6.03% in YRDA, and 11.84%

in Shanghai, compared with 3.88% in China as a whole. As to the distribution of highly educated population, the global city of Shanghai, and the two capital cities, namely Nanjing and Hangzhou, jointly absorb 61.3% of all population with college degree and above. These three cities also absorb 92% of those who have postgraduate educational level. It shows that YRDA has the advantage of abundant supply of skilled labor. However, the situation is not uniform in this regard. Some rapidly developing cities, such as Suzhou and Ningbo, are now facing serious shortage of skilled labor and highly educated talents, and this weakens their capacity for innovation and further industrial upgrading in these cities.

(Table-4 about here)

Fifth, YRDA is much industrialized than the rest of China. The employment proportion in agriculture and fishery sector is 64.4% in China, while it is 31.2% in YRDA. Labor employed in manufacturing and industrial sector is 41.1% in YRDA, far higher than 16.8% in whole China. The labor employed in social and business services sector is 27.7% in YRDA, higher than that of 18.8% in China.

Within YRDA, we see a sequence of degree of industrialization. Taizhou, Taiizhou and Nantong have dominant agriculture and fishery sector, while in Shaoxing, Jiaxing and Zhenjiang manufacturing and industrial sectors are more important than agriculture and fishery, but less important than social and business services. Suzhou, Wuxi, Changzhou, Yangzhou, Hangzhou and Ningbo have a dominant manufacturing sector, and their social and business sector are more important than agriculture and fishery sectors. In terms of labor distribution, Shanghai and Nanjing both have a dominant social and business services sector, whose weight is greater than that of manufacture and industrial sector. Agriculture sector in these two cities has very little weight, accounting for only about 10 percent. Meanwhile, southeast Jiang'su province and northeast Zhe'jiang province are positioned at a later phase of industrialization, and Shanghai has been witnessing a transition from an industrialized to a post-industrialized service economy. These differences in industrial development also determine further economic structure and spatial functions within different locations in YRDA.

(Table-5 about here)

Sixth, YRDA also leads China in the degree of urbanization. Compared to the average urbanization degree, in China which is 36.22%, urbanization degree in YRDA is 57.84%. Shanghai has the highest urbanization degree of 88.31%. The second place is taken by Nanjing, which is 71%. Suzhou, Wuxi, and Hangzhou have an urbanization degree of around 50-60%. Meanwhile, Yangzhou, Taiizhou, Huzhou and Jiaxing have urbanization degree of around 40-50%. Nantong has the lowest urbanization degree in YRDA, around 34%. Thus a big g can be seen in urbanization degree between Shanghai and other metropolitan areas. It shows considerable unevenness of urban development in YRDA.

(Figure-2 about here)

2. Forms of Migration

2.1 Migration and its Impacts on Population Dynamics and Regional Development
In the post-population transition period, and after YRDA has almost achieved the zero rate of natural population growth, migration becomes the key factor for population dynamics in YRDA. The increase of total population is mostly caused by migration. Migration has deep influence on population structure, population distribution and other demographic characteristics in YRDA. Flows of financial capital, logistic goods, and local networking have strong influence on regional development, and migration also becomes an important aspect of regional dynamics and has deep influence on industrial development and urban agglomeration.

The replacement migration has good effects by providing sufficient labor for industrialization, and it helps delaying the ageing process (UN 2000). Shen (2005: 41-47) indicates that migration is an effective mechanism for harvesting demographic dividends in the context of rural-urban structure in China. Migration helps transfer rural surplus

labor to urban sectors, and it helps slow down the process of urban ageing and prolongs the "window of opportunity"[1].

Wang and Shen (2001) conducted empirical studies in Shanghai area. The study shows that labor migration has double-sided effects on local labor market. On the one hand, migration could provide high-skilled workers and also workers for low wage dirty work. On the other hand, migration brings along some competition for employment opportunities with local labor. Ren and Wang (2003: 42-49) quantitative research suggests that in general, migration can have significant and positive effects on economic development in urban China.

Human capital is one significant factor for migration, which implies that migrants have comparatively higher educational degree than population in the out-migrating area. Zhu (2005) measures the migrants' educational level and indicates that the average educational level of the migrants is higher than of local residents' in YRDA, except for Shanghai, Wuxi and Changzhou. Therefore, migration has had positive effects in improving average educational level in YRDA. Migration from outside YRDA has positive effects on human capital accumulation, while migration among cities has diluting impact on human capital differences among cities, and this leads to integration inside YRDA.

Migration is both the outcome and the concomitant process of regional industrial development, and migration in turn has complex influence on regional development. It is an important indicator of regional competitiveness. Labor supply and human capital accumulation are indispensable resources for economic prosperity, and they boost urbanization and reshape the urban structure. Meanwhile, we should recognize that migration also brings in pressure on resource and environment and on public safety and social welfare situation in YRDA.

2.2 Forms of Migration and Urbanization

Classical thoughts on migration forms and urbanization could be traced back to Lewis (1954) model of dualistic growth. Manufacturing brings along the effects of migration from agriculture sector to urban industrial sector. The increasing profit in

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[1] Window of Opportunity is a similar concept as demographic dividends

manufacturing enables the entrepreneurs to increase investment, thus to continuously increase the employment of immigrants from rural area to cities.

Lewis model describes the rural-urban migration and its linkages with urban industrialization. However others have contended that Lewis model is too simple to describe various forms that migration takes in real world. For example, Champion (2003) concludes that dualistic urban-rural or manufacturing-agriculture model can not well explain the new industrial developments such as social and business services, new innovations in information and communication technology. Thus, according to Champion, Lewis model falls short in the context of post-industrialized society. He also notices that the new phenomenon of migration from urban to rural area in the context of diffusion of industries in most big metropolitan cities around the world.

The industrialization and economic growth bring in the expansion of logistic services, the booming of new start-ups, migration and population congregation. They also facilitate the construction of urban infrastructure and the spread of urbanized area. Industrialization, migration and urbanization have close linkages with each other, and they constitute a dynamic mechanism, and this complicated process boosts the continuous migration and urban system development in a regional context (Ren 2005). Cities are strengthening their linkages with other cities in the context of extension of globalization and industrial spatial division, product chains, logistic services and information services. It also produces the outcome for establishing a migration network among cities.

Migration shows different forms and features in different locations during different phases of urbanization. Newling (1966) puts forward an intra-urban allometric growth and the declining population density gradient through time, indicating comparative changes of population in different areas within an urban region. Klassen (1981) introduces the outskirt oriented de-urbanization process after population congregation into cities during urbanization. The phenomenon of "Return to the City Movement" begins to occur after 1980s in the context of urban regeneration and results in a re-urbanization process (Champion 2000). Meanwhile, with case studies in New York, Mollenkopf (1991) shows that gentrification and moving back to the city by the rich are also accompanied by the low income households migrating out of the city and the population redistribution inside the central urban area. These also indicate that the

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processes of in-migration and out-migration are occurring simultaneously within an urban area.

Hall (1984) pays attention to migration and urban development under a much bigger regional scale. He studies population dynamics among cities, including the leading city, general cities, and non-urban areas in a region. It shows that migration directions and growth of different cities have different features over time, and thus determining the shaping and changing of the whole urban structure. The minor cities' urbanization process usually lags behind that of the leading city in the region. Different cities have different urbanization degree, different industrial selection, and different economic development levels. The process shows different strength of economic relations among cities, thus making migration within an urban agglomeration a much complicated process.

If we take a regional view of migration and urban development, there always co-exist different forms of internal migration (rural-rural, rural-urban, urban-urban, and urban-rural) and international migration (permanent migrants, labor, refugee, and undocumented/illegal migrants). In YRDA, there are migrations from rural area to urban area, and from one city to other cities, and flowing inward and outward of an urban area. Some cities might be at the stage of a fast congregation to downtown cities, while other cities might be experiencing deep industrial adjustment and population moving to outskirt.

The foreign laborers are so far are still very few and international migration still remains at a minimum level in YRDA. Even in a much globally oriented city like Shanghai, the proportion of permanent foreigners is around 0.6%, which is much less than most international cities. In this paper, two types of dominant internal migration forms will be discussed. First, migration between Outside-YRDA (OYRDA) and inside-YRDA, that is, from OYRDA inward YRDA, or from YRDA outward OYRDA. This form of migration is the main determinant of the population growth in the area. Second, migration among cities will be discussed. This type of migration is caused by difference in economic growth among different cities. Both forms of migration influence the population distribution among cities, and they also influence the relative status of different cities in the region. We will also study the joint impact of the two internal migration forms on shaping of regional urban structure and its future evolutions in YRDA.

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3. Data Sources

There are two different definitions of migration in Chinese statistics. One is migration based on *hukou* system, and the other is based on residence period. The latter refers to those having permanently changed their living places. We can get annual *hukou*-based migration data from statistics yearbook. However it is much lower than the migration measured based on residence in YRDA. Given that there is a great number of migrants living in cities, and the number is increasing very quickly, and especially that around 75% of those floating migrants are actually long-term residing in YRDA, *hukou*-based migration data cannot well explain the socioeconomic development. Residence based migration data can be a better indicator for analyzing migration issues than *hukou* migration data to be found in statistics yearbook in China nowadays.

These residence based migrants can be referred as those migrants residing in the surveyed area more than half a year, and those residing in the surveyed area while leaving their original resident place for more than half a year, regardless that they have obtained local *hukou* or not. We will take this definition din our research presented below. The data source of the paper is the 0.095% sample from Chinese 2000 population census. In addition, urban specific fertility and mortality data are acquired directly from the *Tabulation on the 2000 Population Census of the People's Republic of China* (2002).

4. Degrees and the Patterns of Migration among Different Cities in YRDA

4.1 Migrants between Inside YRDA and Outside YRDA

From 1995-2000, the number of migrants entering into YRDA is 6.02 million and those flowing out from YRDA to outside YRDA is 1.11 million. This shows that YRDA is an important population congregation area in China. The net immigration population is around 4.91 million and the annual net migration rate is 1.13%.

(Table-6 about here)

Distance is one common recognized factor associated with migration. Within those migrants entering into YRDA, 70% of them are from An'hui province, Middle and North Jiang'su province, Si'chuan province, Jiang'xi province, and Middle and South Zhe'jiang province. It is also well related with a wider YRDA, or an extended YRDA concept we mentioned above, and it well explains the concurrent processes of demographic dynamics and regional economic development. Out-migrants from YRDA to Outside YRDA also reveal the counter influence of some other population congregation areas in China. Guang'dong province and Beijing are some top-ranked destinations for migrants from YRDA outward, and these two areas also play the leading role in the Chinese Pearl River Delta Area and Bo-sea surround region, respectively.

YRDA is a typical population congregation area, while it is not in equilibrium among different cities when migrants flow into this area from outside YRDA.

(Table-7 about here)

(1) Shanghai has the largest number of immigrants from outside YRDA, and they account for 29.4% of total migrants. Shanghai has the highest immigration rate. This shows that migrants entering YRDA are much likely to migrate toward Shanghai.

(2) Shanghai, Suzhou, Ningbo, Hangzhou, Wuxi are the top 5 cities for immigrants from outside YRDA and they account for 65.6% of total migrants.

(3) Taizhou and Nantong have larger number of out-migrants to outside YRDA. Shanghai and Hangzhou also have comparatively high number of out-migrants. However, because of Shanghai's large population, its out-migration rate is comparatively low. Taizhou has a very high out-migration rate.

(4) For all cities inside YRDA, migrants from outside YRDA to inside YRDA are more then migrants from inside YRDA to outside YRDA. Those cities include Shanghai, Suzhou, Wuxi, Ningbo and Hangzhou, which have relatively high immigration rate and comparatively low out-migration rate. These are target cities for migrants from outside

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YRDA. The second group of cities consists of those with relatively low immigration rate and relatively high out-migration rate. These include Nantong, Taiizhou, Yangzhou, Shaoxing and Zhoushan. These cities are quite marginalized in YRDA. Third, Taizhou has especially high immigration rate and high out-migration rate. It shows that Taizhou serves the function of an exchange hub interacting with nearby area and extending the economic strength of YRDA.

4.2 Migrations within YRDA

We can divide YRDA into three sub-areas according to administrative precincts. They are Shanghai, South-East Jiang'su province, and North-East Zhe'jiang province. It also shows a population congregation trend toward Shanghai in YRDA. Both Jiang'su province and Zhe'jiang province have tight relationship with Shanghai. However, there is comparatively less linkage between these two areas. It is obvious that Shanghai is strengthening its central position in YRDA. This is cnsistent with the "Butterfly Strategy," under which Shanghai serves as the economic head with Jiang'su province and Zhe'jiang province as two wings. However, it remains a question as to how to strengthen the relationship between the two wings in order to increase the networking for further regional development.

(Table-8 about here)

When we observe the migration matrix of different cities within YRDA, there are two types of cities according to intra-urban migration within YRDA. One type consists of cities with positive net-migration. These include Shanghai, Nanjing, Suzhou, Hangzhou, Ningbo, Wuxi and Jiaxing. Among these cities, Shanghai has the typical feature of high immigration rate and a very low out-migration rate. This shows Shanghai's central status within YRDA. Meanwhile, Jiaxing has a comparatively low immigration rate and an even lower out-migration rate, thus it has a positive net-immigration rate in YRDA. Other cities have comparatively low in-migration rate, high out-migration rate, and a negative net immigration within YRDA. These include Taizhou, Shaoxing, Nantong, Huzhou, Taiizhou, Zhenjiang, Changzhou, and Zhoushan.

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(Table-9 about here)

Regarding immigration among YRDA cities, Shanghai, Nanjing, Hangzhou, Ningbo and Suzhou rank among the top five. Nanjing's immigration rate is even higher than that of Shanghai.

Thus intra-urban migration pattern reveals the dynamics of population re-unification and some aspects of the changes of urban structure within YRDA. Most cities have Shanghai as the main destination for their migration within YRDA. This is especially true for Nantong, Taizhou, Shaoxing and Taiizhou. This indicates that Shanghai serves as the core city of the urban agglomeration within YRDA. Nanjing has strong attraction to Zhenjiang, Changzhou, Nantong and Yangzhou. Thus it plays the role of provincial central city for migration. Hangzhou takes the similar role in Zhe'jiang Province, which has strong attraction to Huzhou, Jiaxing and Shaoxing. Suzhou now is showing increasing attraction to Nantong, Taiizhou, Wuxi, and the migrants between Wuxi and Suzhou even exceeds in number than that between Wuxi and Nanjing. Meanwhile, Ningbo also shows an important aggregative force for Taizhou and Shaoxing. These processes are gradually shaping five urban groups based on those above five cities as the cores within YRDA. Among those cities, Shanghai is the leading regional central city, Nanjing and Hangzhou are two important sub-central cities in the region, while Suzhou and Ningbo are rising sub-central cities.

4.3 Overall Patterns of Urban Specific Migration

(Table-10 about here)

Table-10 presents an integrated calculation of the overall degree of migration among YRDA cites, by combining migration between inside YRDA and outside YRDA, and among cities within YRDA. We can categorize these cities into three main patterns, as indicated in Table-11:

(Table-11 about here)

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First, taking the criteria of 1% in urban specific total net migration rate, we could define some "fast population congregating central cities," such as Shanghai, Shanghai, Ningbo, Hangzhou, Nanjing, Wuxi, Changzhou and Jiaxing. These cities generally have a high immigration rate from outside YRDA, a high immigration rate within YRDA, a low out-migration rate to outside YRDA[1], and a low out-migration rate to other YRDA cities. Meanwhile we can see that Shanghai has the highest immigration rate from outside YRDA, and the lowest out-migration rate among intra-urban migrations within YRDA. That means that Shanghai is continuously strengthening its position in the urban agglomeration in YRDA. Regarding to Jiaxing's case, although its immigration rate is not as high as other fast population congregating cities, it has a comparatively less momentum for migrating out of YRDA and migrating into other YRDA cities. Its total migration rate is 1.06 percent and this is slightly higher than our criteria of 1%. We could regard Jiaxing to be of similar migration pattern as of the first group cities. These fast population congregating cities show strong competitiveness in regional development.

Second, there are some cities that can be regarded as "net population decreasing cities." These include Nantong, Taiizhou, Yangzhou and Zhoushan. Those cities have low immigration rates from outside YRDA, low immigration rates through intra-urban dynamics within YRDA[2], while having comparatively high out-migration rates outward YRDA (except Zhenjiang and Taiizhou), and they also have high out-migration rates to other YRDA cities. These cities are gradually lagging behind inside YRDA.

Third, some the other cities could be regarded as some "slightly growing population cities." These include Zhenjiang, Shaoxing, Huzhou and Taizhou. Most of these cities have low migration from outside YRDA, and low migration from other cities within YRDA. Shaoxing and Zhoushan have comparatively higher out-migration rates to outside YRDA, and all these cities have high out-migration rate to the rest of the cities within YRDA. This shows those cities are strongly influenced by central industrial cities nearby. Most of these cities are actually located at "rupture points" between two big industrial

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[1] While Ningbo, Hangzhou, Nanjing and Changzhou have comparative higher out-migration rate then other cities, it might show that phenomenon there are large number of entrepreneurs and high knowledgeable technicians seeking further business opportunities and development opportunities outside YRDA in context of our analysis that Guangdong and Beijing are some main migration directions from YRDA.
[2] Zhoushan has a comparative high immigration rate within YRDA, and its out-migration rate to other YRDA cities is even higher.

cities, like Zhenjiang, Shaoxing, and Huzhou. Their location aggravates their discomfiture during the industrialization process. Taizhou is an interesting exception of this group. Taizhou has an especially high immigration rate from outside YRDA, and it also has the lowest immigration rate from other YRDA cities. However, it has the highest migration rate outward outside YRDA, and out-migration rate to other cities within YRDA. It shows that Taizhou mostly serves as a hub for transition from outside YRDA and inside YRDA, and that a large number of migrants take a stepwise migration strategy to enter Taizhou first, and then migrate further to other YRDA cities.

5. Future Projections on Population Growth and Urban Agglomeration Development in YRDA

Urban specific total net migration shows different effects on different cities within YRDA, and it determines the gradual evolution of the urban structure. According to Population Equation Function, population dynamic is the joint outcome of natural increase and net migration. Based on contemporary urban specific natural increase model and migration model, we could make a future population projection based on the following function:

$$P_{(t+1,i)} = P_{(t,i)} * (1 + NIR_{(t,i)}) * (1 + USTNMR_{(t,i)})$$

$P_{(t,i)}$: Population for the "i" city at the time point of "t"
NIR: Natural Increase Rate
USTNMR: Urban Specific Total Net Migration Rate

In the context of globalization and industrialization, YRDA is becoming the "Global Factory", and an urban agglomeration with continuous population congregation. There are different estimations of future population in YRDA, those from a lowt estimate of 90 million, according to existing urban planning of different cities, to a much higher estimate of 300 million by Wen (2004). Zhu (2004) estimates the population in YRDA

and concludes that it will be 99 million in 2020 based on population redistribution around China[1]. Zhang and Zeng's estimation (2004) is 112 million based on an economic development and employment model. Based on the migration pattern and population dynamics equation we list above, the population projection for YRDA is as indicated in Table-12.

(Table-12 about here)

Undoubtedly YRDA has been a major population congregation area and will continue to serve this function in next few decades under the condition of fast economic growth. The total population in YRDA will most likely be 100 million around 2010.

Taking a natural evolution in YRDA, the urban agglomeration will be centered with the global city of Shanghai, and will be based on another four big urban groups composed of Hangzhou, Suzhou, Nanjing and Ningbo. Shanghai's population may be 20 million in 2010. However, it is highly likely that the future population of metropolitan Shanghai will not keep increasing and may actually decline in the long run because of the industrial upgrading and construction of high-speed intra-urban transportation system. When this turning point will occur can be the topic worthy of further studies. Meanwhile, urban areas, including Suzhou, Hangzhou, Nanjing, and Ningbo, will keep increasing in terms of their population and urbanized area. These five urban groups might account for 52% of total population within YRDA in 2010, when the proportion is around 48% so far. These five urban groups will carry more functions of industrialization and population congregation to facilitate further regional development.

We should admit here that the population projection is always based on existent population dynamics, and future population dynamics will be influenced by different paces of economic growth and industrial adjustment among different cities. Uncertainty and random factors will always have their effects on the future of human livelihood. What we could do is to try to make an approximate estimation for the future trend based on pur understanding of current population dynamic patterns and their intrinsic laws.

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[1] Zhu's analysis did not include Taizhou area within YRDA. The population of YRDA will be 105 million including Taizhou if we take a same methodology for population projection.

6. Further Discussions on Future Regional Development in YRDA

After having accomplished population transition and after having achieved a stable low fertility, migration becomes the key factor for population dynamics in YRDA. YRDA will keep its pace of population congregation, and have a continuous influence on the evolution of urban structure in the long run. To further accelerate the regional development, we should pay attention to dealing with these affairs that arise from fast migration and urbanization.

First, it is necessary to take a migration-led development strategy in YRDA within the context of the national population redistribution and regional development.

Internal migration in YRDA can be considered from the perspective of the population redistribution in the whole nation. The redistribution has the trend of migrating from the west and the middle part of China to the eastern coastal area where there is a comparatively stronger capacity to produce employment opportunities, to create more resources and to coordinate ecological conditions. The annual net population increase in YRDA may be 1.3-1.4 million. Migration will give a strong impetus to industrial development in eastern urban China, while also having the positive effect of increasing income of western and rural area. Therefore, it is a beneficial strategy to continue boosting the process of migration from West China to East China.

As a country with a vast territory and great variety in regional social, economic, resource, and environmental conditions, China should adopt differential development strategies in different regions. The migration-led urban agglomeration development should be the leading strategy for eastern China, especially in YRDA. The Pacific Ocean coastal urban agglomeration (Tokyo- Nagoya- Osaka) in Japan can provide YRDA with an empirical example and some useful insight. The total area of Japan's coastal area urban agglomeration is also around 100 thousand square kilometers with a population of 70 million. With railway-based fast intra-urban system, Tokyo centered urban agglomeration and industrial belt can give YRDA, and those cities within YRDA, a good reference for further development.

Second, YRDA should strike a good balance between migration and regional sustainability, and it should push institutional reforms for adjusting and managing migrations. Although YRDA has a great potential for population congregation, and migration has positive effects on boosting economic development for immigrating area, the carrying capacity of YRDA is not infinite. YRDA should take a steady pace to attract immigration so as to improve and to achieve regional sustainability in the context of changing economic patterns, modification of life style to a much sustainable style, changing of urban-rural configurations, and improvement of urban infrastructures. In other words, YRDA should seek a strategy to develop a sustainable and ideal YRDA.

A large number of floating people flux into the cities, and this always creates pressure on urban infrastructure, transportation, housing, social welfare, and other kinds of public services. In contemporary urban China, most migrants without *hukou* are facing social exclusions from most public services and citizen rights. Therefore an integration-oriented social policy is widely advocated. This could also be a great challenge for urban and regional management in YRDA. Especially, central cities, to which population is fast congregating are urgently facing the demand for exploring the institutional reforms necessary for migrant management, and for exploring the consequences of breaking down the urban-rural barriers.

Third, local governments should advocate differential development strategies among different cities within YRDA, and strengthen regional coordination system for achieving an integrated regional development strategy. In YRDA, different cities have different migration patterns. Local governments therefore should take distinctive functional targeting and adopt differential development strategies, depending on whether they are dealing with cities experiencing fast population congregation, or cities with net population decrease, or cities with slightly increasing population.

Much intensified and conglomerate urbanization strategy should be adopted for central cities and emerging urban groups, including Shanghai, Suzhou, Nanjing, Hangzhou and Ningbo. Shanghai is taking the leading role within YRDA, and it will strengthen its role as the hub for globalization and as the engine for regional development through upgrading its innovative capacity and industrial structure. These cities should acquire much support in land-usage planning, urban infrastructure investment, etc.

Meanwhile, even in fast economic development area like YRDA, we still find some cities with net population decrease. These include Nantong, Taizhou and Yangzhou, which mostly lie in the north of Yangtze River. Undoubtedly their lagging behind is related with the inconvenience of transportation caused by obstruction of the Yangtze River, and the development of transportation system is urgently needed for those cities. The contemporary 5 city groups are shaped based on the "Z-like" railway system. A convenient transportation network, especially the railway system, among cities should have great impetus for the further evolution of the urban system within YRDA.

It is also very important to take an integrated approach and set up a dynamic institutional arrangement to optimize regional development. The intra-urban development is much influenced by administrative jurisdiction so far, and this usually brings in over-competition, repeat construction, and decentralization of industrial development. It is of great importance for building an intra-urban coordination system beyond administrative segmentation. Achieving such regional coordination can be a political issue. For example, if we pay more attention to the efficiency of regional development, it might imply that we need to continue strengthening the role of leading cities and city groups. On the other hand, if you emphasize equality, you may want to give more support to the less developed cities and improve their competitiveness. These opposite attitudes will always provoke great debate, and will strongly influence the policies and approaches to regional development.

Future evolution of the urban agglomeration actually cannot be fully predicted. In most cases, the reality of development usually is not our designed development, but the development itself is shaping its feature and creating its own path forward. Migration and evolution of urban structure are also much influenced by the complicated processes of global capital mobility, industrial adjustment, and upgrading, etc. and are influenced by compromises among different interest groups. To predict what features the process will show in future in YRDA, we need to further understand the nature and magnitude of forces behind the fast regional development.

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Table-1: Population and Population Density in YRDA

Area	Acreage (Square Kilometer)	Household Population (million)	Household Population Density (people per square kilometer)	Permanent Population* (million)	Permanent Population Density (people per square kilometer)
China	960.00	1265.8	132	1265.8	132
YRDA	109661.7	80.51	734.20	87.43	797.28
SHANGHAI	6340.5	13.21	2084.43	16.41	2587.76
SE_JIANGSU	48521.1	39.02	804.29	41.51	855.58
NE_ZHEJIANG	54800.1	28.27	515.93	29.51	538.50

*

Table -2: Natural Increase in YRDA (%)

	CBR	CDR	Natural Increase Rate
CHINA	128.6	64.1	64.5
YRDA	**76.2**	**61.8**	**14.4**
SHANGHAI	55.1	57.8	-2.7
SE_JIANGSU	72.1	63.8	8.3
NE_ZHEJIANG	93.8	61.3	32.5

Table-3: Ageing Degree in YRDA (2000)

Area	Total Population	Age Group (0-14)	Age Group (15-64)	Age Group (65 and above)
CHINA	126583	22.89	70.15	6.96
YRDA	8743.13	15.89	74.17	9.94
SHANGHAI	1640.77	12.30	76.30	11.40
SE_JIANGSU	4151.35	16.49	73.77	9.74
NE_ZHEJIANG	2951.01	17.07	73.54	9.38
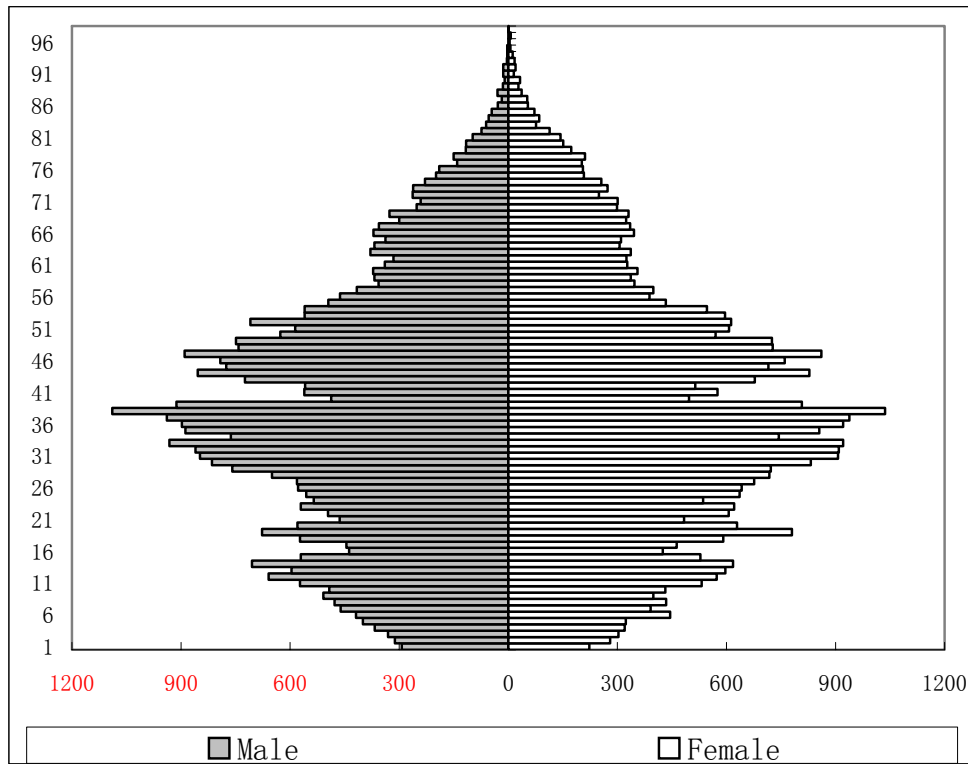
Figure-1: Population Pyramid in YRDA
Data source: 0.095% sample database from 2000 census

Table-4: Population Educational Structure (2000)

	Illiterate	Primary School	Junior High School	High School	Technical Secondary School	Junior College	Under-graduate	Post-graduate
YRDA	9.54%	32.42%	36.08%	11.70%	4.23%	3.51%	2.35%	0.17%
SHANGHAI	7.18%	19.55%	37.69%	16.36%	7.39%	6.24%	5.18%	0.42%
SE_JIANGSU	9.48%	32.96%	36.66%	11.68%	4.09%	3.08%	1.95%	0.11%
NE_ZHEJIANG	10.93%	38.84%	34.36%	9.14%	2.67%	2.60%	1.33%	0.13%
CHINA	9.41%	38.31%	36.45%	11.96%		3.88%		

Data source: 0.095% sample database from 2000 census

Table-5: Labor Distribution Structure in YRDA (2000)

	Agriculture and Fishery Sector	Manufacturing and Industrial Sector	Business and Social Services Sector
CHINA	50.0	22.5	27.5
YRDA	26.4	41.0	32.7
SHANGHAI	10.6	40.5	48.8
SE_JIANGSU	29.9	40.0	30.1
NE_ZHEJAING	29.3	42.2	28.6

Data source: 0.095% sample database from 2000 census

Figure-2: Urbanization Degree of City Areas in YRDA (2000)

Table-6: Migration between OYRDA with YRDA (1995-2000)

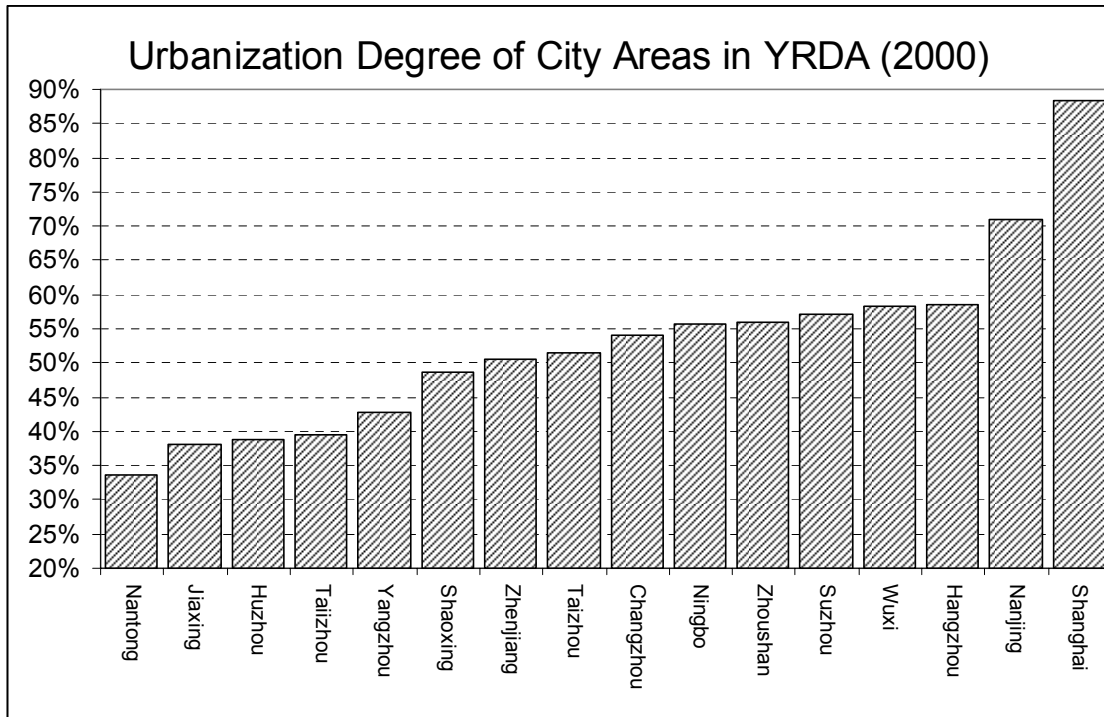| Population Migration from OYRDA into YRDA				Population Migration from YRDA outward OYRDA			
Rank	Province/ Area	Immigrants (million)	Proportion	Rank	Province /Area	Out-migrants (million)	Proportion
1	Anhui	1.809	30.10%	1	Guangdong	0.177	15.88%
2	MN-Jiangsu	0.946	15.70%	2	Anhui	0.128	11.53%
3	Sichuan	0.565	9.40%	3	MS-Zhejiang	0.103	9.26%
4	Jiangxi	0.533	8.80%	4	MN-Jiangsu	0.097	8.70%
5	MS-Zhejiang	0.377	6.30%	5	Beijing	0.080	7.18%
6	Henan	0.281	4.70%	6	Shandong	0.043	3.88%
7	Hubei	0.239	4.00%	7	Hubei	0.043	3.88%
8	Guizhou	0.215	3.60%	8	Shannxi	0.038	3.40%
9	Chongqing	0.156	2.60%	9	Xinjiang	0.038	3.40%
10	Hunan	0.156	2.60%	10	Yunnan	0.036	3.21%
11	Fujian	0.129	2.20%	11	Sichuan	0.035	3.12%
12	Shandong	0.105	1.70%	12	Fujian	0.034	3.02%
13	Guangdong	0.068	1.10%	13	Henan	0.032	2.84%
14	Yunnan	0.067	1.10%	14	Jilin	0.027	2.46%
15	Shannxi	0.048	0.80%	15	Jiangxi	0.024	2.17%
16	Xinjiang	0.04	0.70%	16	Liaoning	0.022	1.98%
17	Beijing	0.038	0.60%	17	Tianjin	0.020	1.80%
18	Gansu	0.035	0.60%	18	Chongqing	0.020	1.80%
19	Hebei	0.034	0.60%	19	Hebei	0.019	1.70%
20	Heilongjiang	0.033	0.50%	20	Guangxi	0.019	1.70%
21	Guangxi	0.029	0.50%	21	Guizhou	0.016	1.42%
22	Liaoning	0.023	0.40%	22	Shanxi	0.014	1.23%
23	Jining	0.02	0.30%	23	Hunan	0.011	0.95%
24	Qinghai	0.019	0.30%	24	Heilongjiang	0.009	0.85%
25	Ningxia	0.017	0.30%	25	Qinghai	0.007	0.66%
26	Shanxi	0.013	0.20%	26	Hainan	0.006	0.57%
27	Neimenggu	0.011	0.20%	27	Ningxia	0.006	0.57%
28	Tianjin	0.008	0.10%	28	Neimenggu	0.004	0.38%
29	Hainan	0.003	0.10%	29	Gansu	0.003	0.28%
30	Xizang	0.002	0.00%	30	Xizang	0.002	0.19%
	Total	6.02	100.00%		Total	1.114	100.00%

Data source: 0.095% sample database from 2000 census

Table-7: Migration between Different Cities within YRDA and OYRDA (1995-2000)

	Permanent Population (mil.)	Immigrants from OYRDA (mil.)	Annual Immigration Rate from OYRDA (%)	Out-migrants outward OYRDA (mil.)	Annual YRDA-based Outmigration rate (%)	Annual Net Migration Rate between Cities and OYRDA (%)
Shanghai	16.41	1.77	2.16	0.11	0.13	2.02
Nanjing	6.13	0.41	1.34	0.07	0.23	1.11
Wuxi	5.09	0.45	1.77	0.04	0.16	1.61
Changzhou	3.78	0.31	1.64	0.07	0.37	1.27
Suzhou	6.79	0.66	1.94	0.09	0.27	1.68
Nantong	7.51	0.14	0.37	0.12	0.32	0.05
Yangzhou	4.59	0.10	0.44	0.07	0.31	0.13
Zhenjiang	2.84	0.16	1.13	0.03	0.21	0.92
Taiizhou	4.79	0.07	0.29	0.06	0.25	0.04
Hangzhou	6.88	0.57	1.66	0.11	0.32	1.34
Ningbo	5.96	0.50	1.68	0.08	0.27	1.41
Jiaxing	3.58	0.20	1.12	0.02	0.11	1.01
Huzhou	2.63	0.12	0.91	0.01	0.08	0.84
Shaoxing	4.30	0.18	0.84	0.07	0.33	0.51
Zhoushan	1.00	0.02	0.40	0.02	0.40	0.00
Taizhou	5.15	0.39	1.52	0.14	0.54	0.97

Data source: 0.095% sample database from 2000 census

Table-8: Migration Pattern among Different Sub-Regions within YRDA (thousand)

Out\In	Shanghai	SE-Jiang'su	NE-Zhe'jiang	Total Outmigrants
Shanghai		52	23	75
SE-Jiang'su	284		29	314
NE-Zhe'Jiang	158	068		226
Total Immigrants	442	120	52	
Net Immigrants	367	- 294	- 174	

Data source: 0.095% sample database from 2000 census

Table-9: Intra-Urban Migration with YRDA (1995-2000)　(unit: thousand)

	Shanghai	Nanjing	Wuxi	Changzhou	Suzhou	Nantong	Yangzhou	Zhenjiang	Taiizhou	Hangzhou	Ningbo	Jiaxing	Huzhou	Shaoxing	Zhoushan	Taizhou	Total Outmigrants	Annual outmigration Rate (%)
Shanghai		5.3	4.2	3.2	12.6	13.7	5.3	0.0	7.4	3.2	4.2	5.3	1.1	1.1	2.1	6.3	74.7	0.09
Nanjing	28.4		13.7	9.5	8.4	6.3	12.6	3.2	4.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	87.4	0.29
Wuxi	6.3	11.6		10.5	14.7	3.2	5.3	1.1	3.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0	58.9	0.23
Changzhou	5.3	29.5	13.7		3.2	1.1	6.3	8.4	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.5	0.37
Suzhou	21.1	28.4	13.7	4.2		7.4	1.1	2.1	0.0	0.0	0.0	2.1	1.1	0.0	0.0	1.1	82.1	0.24
Nantong	134.7	34.7	13.7	6.3	29.5		3.2	2.1	4.2	0.0	0.0	0.0	0.0	0.0	1.1	0.0	229.5	0.61
Yangzhou	35.8	32.6	1.1	6.3	4.2	4.2		5.3	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.7	0.41
Zhenjiang	10.5	24.2	9.5	7.4	12.6	3.2	3.2		3.2	0.0	2.1	0.0	0.0	1.1	0.0	0.0	76.8	0.54
Taiizhou	42.1	17.9	15.8	6.3	23.2	3.2	16.8	4.2		4.2	4.2	2.1	6.3	0.0	0.0	0.0	146.3	0.61
Hangzhou	16.8	0.0	0.0	0.0	2.1	0.0	0.0	0.0	1.1		11.6	8.4	2.1	17.9	6.3	3.2	69.5	0.20
Ningbo	17.9	2.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	22.1		4.2	0.0	4.2	3.2	7.4	62.1	0.21
Jiaxing	2.1	0.0	0.0	0.0	8.4	0.0	0.0	0.0	0.0	9.5	3.2		0.0	2.1	0.0	0.0	25.3	0.14
Huzhou	17.9	3.2	4.2	2.1	3.2	1.1	0.0	0.0	0.0	15.8	6.3	3.2		8.4	0.0	2.1	67.4	0.51
Shaoxing	45.3	2.1	0.0	0.0	6.3	0.0	0.0	0.0	0.0	49.5	18.9	9.5	0.0		2.1	2.1	135.8	0.63
Zhoushan	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	4.2	0.0	2.1	0.0		1.1	20.0	0.40
Taizhou	50.5	3.2	6.3	3.2	17.9	0.0	0.0	0.0	1.1	34.7	72.6	0.0	7.4	5.3	1.1		203.2	0.79
Total Immigrants	442.1	194.7	95.8	58.9	147.4	43.2	53.7	26.3	32.6	148.4	127.4	34.7	20.0	40.0	15.8	23.2	1504.2	
Annual Immigration Rate (%)	0.54	0.64	0.38	0.31	0.43	0.12	0.23	0.19	0.14	0.43	0.43	0.19	0.15	0.19	0.32	0.09		
Net Immigrants	367.4	107.3	36.9	-11.6	65.3	-186.3	-41	-50.5	-113.7	78.9	65.3	9.4	-47.4	-95.8	-4.2	-180		
Net Immigration Rate (%)	0.448	0.35	0.145	-0.061	0.192	-0.496	-0.178	-0.355	-0.475	0.229	0.219	0.052	-0.361	-0.445	-0.084	-0.70		

Table-10: Urban Specific Overall Migration Rate

	Permanent Population (mil.)	Annual Immigration Rate from OYRDA (%)	Annual Immigration Rate within YRDA (%)	Annual YRDA-based Outmigration rate (%)	Annual outmigration Rate within YRDA (%)	Total Urban Specific Net Annual Immigration Rate (%)
Shanghai	16.41	2.16	0.54	0.13	0.09	2.48
Nanjing	6.13	1.34	0.64	0.23	0.29	1.46
Wuxi	5.09	1.77	0.38	0.16	0.23	1.76
Changzhou	3.78	1.64	0.31	0.37	0.37	1.21
Suzhou	6.79	1.94	0.43	0.27	0.24	1.86
Nantong	7.51	0.37	0.12	0.32	0.61	-0.44
Yangzhou	4.59	0.44	0.23	0.31	0.41	-0.05
Zhenjiang	2.84	1.13	0.19	0.21	0.54	0.57
Taiizhou	4.79	0.29	0.14	0.25	0.61	-0.43
Hangzhou	6.88	1.66	0.43	0.32	0.20	1.57
Ningbo	5.96	1.68	0.43	0.27	0.21	1.63
Jiaxing	3.58	1.12	0.19	0.11	0.14	1.06
Huzhou	2.63	0.91	0.15	0.08	0.51	0.47
Shaoxing	4.30	0.84	0.19	0.33	0.63	0.07
Zhoushan	1.00	0.40	0.32	0.40	0.40	-0.08
Taizhou	5.15	1.52	0.09	0.54	0.79	0.28

Table-11: Main Patterns of Migration for Different Cities within YRDA

	Annual Immigration Rate from OYRDA	Annual Immigration Rate within YRDA	Annual Migration Outward OYRDA	Annual Outmigration within YRDA	Total Urban Specific Net Immigration
Shanghai	highest			lowest	
Nanjing		highest			
Wuxi					
Changzhou					
Suzhou					
Nantong					
Yangzhou					
Zhenjiang					
Taiizhou	lowest				
Hangzhou					
Ningbo					
Jiaxing			lowest		
Huzhou					
Shaoxing					
Zhoushan		lowest	highest	highest	
Taizhou	special high				

Table-12: Population Projection in YRDA (2005-2010)

	Total Urban Specific Net Annual Immigration Rate (%)	Urban Specific Natural Increase Rate(%)	2000	2005	2006	2007	2008	2009	2010
Shanghai	2.48	-0.027	16.4	18.5	19.0	19.4	19.9	20.4	20.9
Nanjing	1.46	0.165	6.1	6.6	6.7	6.9	7.0	7.1	7.2
Wuxi	1.76	0.188	5.1	5.6	5.7	5.8	5.9	6.1	6.2
Changzhou	1.21	0.154	3.8	4.0	4.1	4.2	4.2	4.3	4.3
Suzhou	1.86	0.085	6.8	7.5	7.6	7.8	7.9	8.1	8.2
Nantong	-0.44	-0.117	7.5	7.3	7.3	7.2	7.2	7.1	7.1
Yangzhou	-0.05	0.137	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Zhenjiang	0.57	0.116	2.8	2.9	3.0	3.0	3.0	3.0	3.0
Taiizhou	-0.43	0.102	4.8	4.7	4.7	4.7	4.7	4.7	4.6
Hangzhou	1.57	0.295	6.9	7.5	7.7	7.8	8.0	8.1	8.3
Ningbo	1.63	0.29	6.0	6.6	6.7	6.8	6.9	7.1	7.2
Jiaxing	1.06	0.232	3.6	3.8	3.9	3.9	4.0	4.0	4.1
Huzhou	0.47	0.212	2.6	2.7	2.7	2.8	2.8	2.8	2.8
Shaoxing	0.07	0.31	4.3	4.4	4.4	4.4	4.4	4.4	4.5
Zhoushan	-0.08	0.094	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Taizhou	0.28	0.584	5.2	5.4	5.4	5.5	5.5	5.6	5.6
TOTAL	−	−	**87.4**	**93.2**	**94.4**	**95.7**	**97.0**	**98.3**	**99.6**

note: data in urban specific natural increase rate are acquired from population census in 2000