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Scenario Analysis on Urbanization and Rural-Urban Migration in China

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Scenario Analysis on Urbanization and Rural-Urban Migration in China

1. Introduction

Since the adoption of its well-known reform and open-door policies in 1978, China has experienced dramatic economic growth in the last decades. From 1978 to 2000, China's GDP increased 7.4 times with an average growth rate of 9.6%. In 2000, the GDP per capita in China reached 7080 *yuan* RMB or about 850 US dollars, and the share of the second and tertiary industries in the composition of the GDP and total employees is respectively 84.1% and 50% while the proportion of urban population to the total population is relatively low, only 36.09%. In contrast to its rapid industrialization and economic development, China's urbanization has proceeded more slowly over the last 20 years.

Recently the serious negative impacts of under-urbanization began to be widely recognized. Some key problems in China's current social and economic development, such as inadequate domestic demand, unduly low income of farmers, and sluggish growth and great pressure on employment, are to a large extent attributable to the lagging urbanization. The process of urbanization is considered to be the center of China's economic development in the next phase (G. Fan, 2001). The Chinese government has realized that active promotion of the urbanization process is of great importance to facilitating Chinese economic restructuring and propelling sustained and rapid economic growth, and has therefore defined it as one of the strategic priorities of China's economic development during the 10th Five Year Plan period.

It has become a common consensus that the most headachy "agriculture, farmers and rural areas" (three *nong*) problems in China are unable to be solved by farmers themselves, inside the agriculture sector and rural areas. Promotion of the urbanization process is needed to help more rural surplus labor forces seek employment in non-agricultural activities and in cities and towns, serving the purpose of reducing the agricultural population, improving agricultural productivity and increasing the farmers' income. In summary, reducing rural population through active promotion of urbanization is considered to be the only best way to make farmers rich. Thus, the prospects and scenarios of China's urbanization and rural-urban migration are bound to have tremendous impacts on its agricultural development and policy making.

The main purpose of this report is to understand the development trend of China's urbanization and rural-urban migration and to formulate alternative urbanization scenarios in the next 30 years, through investigating and assessing its historic trajectory, current situation and policies and prospects of influential factors in the future. It is composed of seven parts. The following Part 2 introduces different definitions on urban places and urban population and various statistical data series in China, facilitating the readers understanding of urbanization in China. Part 3 divides the historical trajectory of China's urbanization and

rural-urban migration over the past 50 years into five periods. Part 4 deals with the unique characteristics of urbanization in China. Part 5 proceeds to the types, driving forces and socio-economic features of rural-urban migration in China. Part 6 presents the projections of China's urbanization level at national and provincial levels by regression models. Part 7 is the prospects and scenarios of China's urbanization and rural-urban migration in the next 30 years under different assumptions on the achievements of its market-oriented institutional reforms.

2. Understanding urbanization in China

In China, urbanization is generally defined as the convergence process of population to urban areas, and measured by the indicator of *urbanization level*, which is the ratio of urban population to the total population in a region or a county (X. Xu, et al, 1999). But due to the frequent changes of criteria for city and town designation and the official urban population definition, there has been a growing confusion about China's urban population and urbanization level. The primary sources of official statistics, such as the State Council Population Census Office, Ministry of Public Security, State Statistic Bureau, use a variety of terms to refer to China's urban population and provide different types of urban population data without clearly defining the terms used, which has caused much confusion and misunderstanding about China's urbanization and the scale of rural-urban migration. For example, the urban population and urbanization level in China in 1999 are respectively 301 million and 23.91% in the pre-1982 definition, 919 million and 72.99% in the 1982 definition, 389 million and 30.90% in the 1990 definition. Many international scholars therefore regarded the size of China's urban population to be an "enigma" (J. Shen, 1995; J. Aird, 1983). In order to make a reasonable scenario for China's urbanization and rural-urban migration, it is essential to understand the changing definitions on city and town designation and the official urban population and the resulted various data series.

2.1 Changing definitions on urban places and their impacts on urban development

Chinese urban places are administrative entities and must be officially approved by the State Council or the provincial-level governments. Officially approved cities and towns, also known as "designated cities (*jianzhi shi*)" and "designated towns (*jianzhi zhen*)" respectively, are the two major components of the Chinese urban system. The first urban directive "Decision by the State Council regarding the establishment of cities and towns", issued in 1955, stated that "The city (*shi*) is an administrative unit that belongs to and is under the leadership of a province, autonomous region or autonomous prefecture" and "The town (*zhen*) is an administrative unit that belongs to and is under the leadership of a county or autonomous county" (PRC State Council, 1955). Correspondingly, there exists a 4-level urban system according to their administrative hierarchy: the provincial-level municipalities directly under the jurisdiction of the Central government (*zhi xia shi*), the prefecture-level cities (*diqu shi*), the county-level cities (*xian shi*) and the towns (*zhen*).

The criteria used by the State Council to officially define the establishment of cities and towns have experienced five major changes although the above hierarchical structure remains intact. The first official criteria, approved by the State Council and issued through the directive of "Decision by the State Council regarding the establishment of Cities and towns" in June 1955, were based mainly on an urban place's population size and administrative status.

Basically, urban places with a clustered population of more than 100,000 can be established as “designated cities”. If necessary, urban places with a clustered population less than 100,000 may acquire “designated city” status provide that they are important industrial and mining bases, seats of province-level state government agencies, relatively large centers for the collection and distribution of goods, or important cities and towns in remote border regions. Urban places with seats of county-level or above state government agencies, or with a clustered population of 2,000 of which 50% or more were from the non-agricultural population, may be established as “designated towns”.

The above criteria were significantly modified by the State Council in 1963 in a “Directive on the adjustment of (the criteria of) establishing cities and towns and on reducing suburban districts of cities”. The minimum size requirement for the establishment of a “designated town” was raised to a clustered population of 3,000 or more and 70% or more share of non-agricultural population, or a clustered population between 2,500 to 3,000 of which 85% or more were non-agricultural population. Although the criteria for the “designated cities” remain unchanged, the qualifications of all designated cities were required to be strictly checked one by one and the area of their suburban districts were significantly reduced because the directive stipulated that the proportion of agricultural population should not exceed 20%. The main reason for the above adjustment was stated that the over-fast growth of designated cities and towns and urban population in the former years had resulted in over-heavy burden on agricultural production.

As China entered the decade of reforms in the 1980s, urban growth was encouraged. Since 1984, a set of more relaxed city and town designation criteria has been employed by the Ministry of Civil Affairs. The current criteria for establishing “designated towns” were issued in 1984 in the “Circular of the State Council approving the report of the Ministry of Civil Affairs regarding the adjustments of the criteria of designated town”. It stipulates that: (1) all seats of county-level state government agencies should be granted “designated towns” status; (2) seats of commune (*xiang*)-level government agencies with more than 2,000 non-agricultural population may abolish the establishment of *xiang* and transform into “designated towns”; (3) Small towns with less than 2,000 non-agricultural population but located within a border, minority, scenic, or remote mountainous areas with sparse population density, or it is a center of mining, industry, can be established as “designated towns” if necessary.

The criteria for establishing “designated cities” was greatly modified in 1986 with the approval of the circular by the State Council, “On Adjustment of Standards for City Designation and Conditions for City to Administer Counties”. It provided the following sets of conditions for city designation: (1a) a regional economic center town with 60,000 non-agricultural population and the GNP of more than 200 million *yuan* RMB; (2a) an important town does not meet the conditions stated in (1a) but is located with in a border, minority, or scenic area, or it is a center of mining, industry, technology, or transportation; (2a) a county has less than 500,000 people; and the county seat town has more than 100,000 in non-agricultural population, less than 40% agricultural residents and has a GNP of more than

300 million *yuan* RMB. The whole county may be designated as a city with the same administrative jurisdiction as before; (2b) a county has more than 500,000 people; and the county seat town has more than 120,000 non-agricultural population, and has a GNP of more than 400 million *yuan* RMB; (3) an autonomous prefecture seat town may be grant the designated city status if necessary, even though it has less than 100,000 non-agricultural population and a GNP less than 300 million *yuan* RMB. (4) A medium-size city of the regional political, economic, scientific and cultural center, with more than 250,000 non-agricultural population within city districts and a GNP of more than 1,000 million *yuan* RMB may administer a number of nearby counties (*shi dai xian*).

In 1993, the criteria for city designation were readjusted by the State Council. Counties are divided into three classes according to their population density and different criteria for transforming the initial county establishment into city designation have been set up for each class (see Table 2 for detail). More criteria items have been included while the scale of non-agricultural population is still the most important one and the economic indicator of GNP is replaced by GDP.

Figure 1 clearly demonstrates that the change definitions on cities and town have significant impacts on the growth of number of cities and towns, in which the dashed lines mark the changing definitions of cities and towns in the specific year. In the early of 1960s when the criteria for establishing cities and towns were raised and restricted, the number of cities and towns began to decline. Further, the continuous relaxation of the criteria for the designation of cities and towns since 1984 has greatly contributed to the sharp growth of the numbers of cities and towns. From 1984 to 1996, the number of cities grew from 193 to 666 with the average annual growth rate of 26 new cities per year. After 1997, the number of cities began to stop or even decline because more small cities near big cities were transformed into urban districts. After the new criteria for town designation was issued in 1984, the number of towns jumped from 2781 at the beginning of 1984 to 6211 at the end of same year and continuously increased to 9755 in 1996.

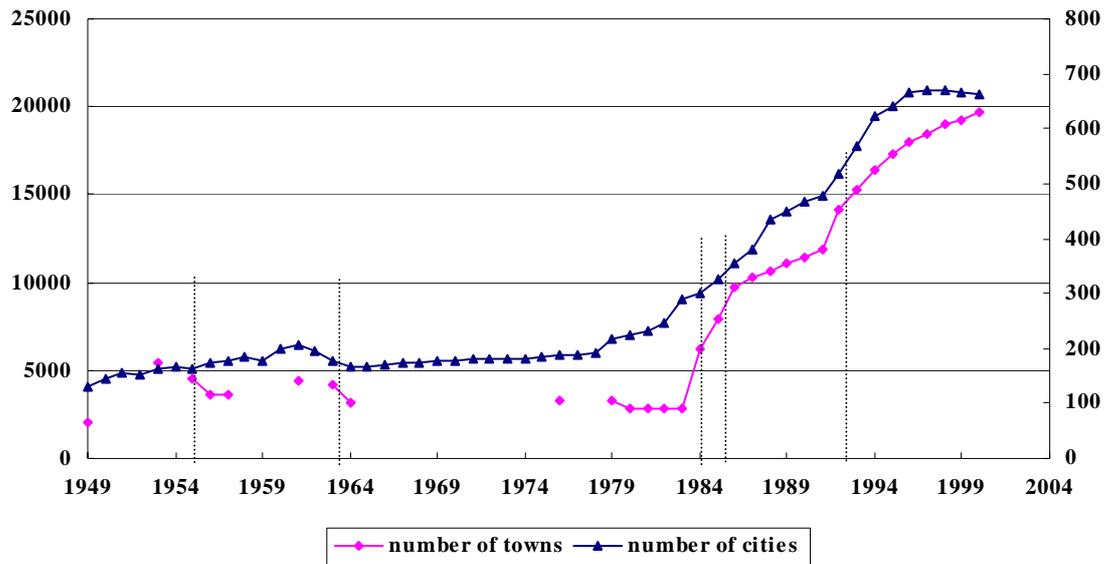


Figure 1. Growth of the number “designated cities” and “designated towns” in China in 1949-2000

Data source: 1) SSB, Cities China 1949-1998, 1999;
 2) SSB, China Statistical Yearbook 2000, 2000.
 3) SSB, China Statistical Yearbook 2001, 2001.
 4) L.Ma. and G. Cui, 1987, Table 2.

Table 1. Different definitions of “designated cities” and “designated towns” in China

Definitions		Criteria	Official document
1955	Designated cities	(1) a place with a clustered population of more than 100,000; (2) or important industrial and mining center, seats of province-level state government agencies, relatively large centers for the collection and distribution of goods, or important cities and towns in remote border regions with a clustered population less than 100,000	“Decision by the State Council regarding the establishment of cities and towns”
	Designated towns	(1) seats of county-level or above state government agencies, (2) or with a clustered population of 2,000 of which 50% or more are non-agricultural population.	
1963	Designated cities	(1) The minimum city size remained unchanged, but the granting of exceptions to places with population of less than 100,000 became stricter. (2) The size of city suburban districts was reduced because proportion of agricultural population was not allowed to exceed 20%.	“Directive on the adjustment of (the criteria of) establishing cities and towns and on reducing the areas of city suburban districts”
	Designated towns	(1) a place with a clustered population of 3,000 or more and more than 70% share of non-agricultural population, (2) or a clustered population between 2,500 to 3,000 of which 85% or more were non-agricultural population.	
1984	Designated towns	(1) all seats of county-level state government agencies, (2) or seats of commune (<i>xiang</i>)-level government agencies with more than 2,000 non-agricultural population.	“Circular of the State Council approving the report of the Ministry of Civil Affairs regarding the adjustments of the criteria of designated town”
	Designated cities	(1a) a place with a non-agricultural population of more than 60,000 and a Gross National Product (GNP) of more than 200 million RMB; (1b) a place does not meet the conditions stated in (1a) but it is located with in a border, minority, or scenic area, or it is a center of mining, industry, and technology or transportation; (2a) a county has less than 500,000 people; the county seat has more than 100,000 in non-agricultural population, less than 40% agricultural resident, and has a GNP of more than 300 million RMB; this county may be designated as a city; (2b) a county has more than 500,000 people; the county seat has more than 120,000 in non-agricultural population, has a GNP of more than 400 million RMB; this county may be designated as a city; (2c) an autonomous prefecture seat has less than 100,000 in non-agricultural population and a GNP of less than 300 million RMB	
1993	Designated cities	Different requirements in the minimum size of non-agricultural population and its share, GDP and the share of the tertiary industry, local financial revenues and level of urban infrastructure. (See Table 2 for details.)	“Report of the Ministry of Civil Affairs regarding the adjustments of the criteria of designated cities”

Table 2. The current criteria for establishing “designated cities”

Criteria	County-level city			Prefecture-level city			
	Population density in the former county						
Population	Seat town of county government agencies	>400	100-400	<100			
	The whole county jurisdiction	Non-agricultural population	>=120 thousand	>=100 thousand	>=80 thousand	Seats of municipality government agencies;	
		Population with non-agricultural hukou	>=80 thousand	>=70 thousand	>=60 thousand	>=200 thousand	
		Total population	>=150 thousand	>=120 thousand	>=100 thousand	Population engaged in non-agricultural activities in city proper > 250 thousand	
Economic	Gross industrial product of town and township-level enterprises or above of the whole county	Population engaged in non-agricultural activities	>= 30%	>= 25%	>= 20%		
		Total	>= 1.5 billion	>= 1.2 billion	>=0.8 billion	> 2.5 billion	
	GDP of the whole county	Proportion to the total gross product of agriculture and industry	>= 80%	>= 70%	>= 60%	> 80%	
		total	>= 1.0 billion	>=0.8 billion	>= 0.6 billion	> 2.5 billion	
	Local financial revenues	Share of the tertiary industry	> 20%	> 20%	> 20%	> 35%	
		Per capita	>= 60 million	>= 50 million	>= 40 million	> 200 million	
Infrastructure	Covering rate of tap water	>= 100	>= 80	>= 60	-		
	Covering rate of tar road	>= 65%	>= 60%	>= 55%	>= 50%		
	Sewer system	good	good	good	good		

2.2 Changing definitions on urban population and their impacts on the measure of urbanization level

2.2.1 Different definitions on urban population

A variety of official statistical terms have been used by Chinese authorities to refer to China's urban population. Basically, China's diverse statistical data on urban population are based on both the urban administrative system and the residence registration (*hukou*) system. The *hukou* system, which was established in the 1950s and classifies all the people either as "agricultural population" or "non-agricultural population", is quite stable. However, due to the frequent changes of definitions of urban population and the urban administrative system, there is a lack of consistent time-series data on China's urban population, and this has caused much confusion and misunderstanding about China's urbanization.

The definition of "urban population" in China has changed in each of the five national censuses. In the first 1953 census, urban population included all population, agricultural and non-agricultural, residing in designated cities and towns. In the second 1964 census the total urban population was limited to the non-agricultural population within the designated urban places, which was based on the "Directive on the adjustment of (the criteria for) establishing cities and towns and on reducing the areas of city suburban districts" issued by the State Council in 1963. This definition excluded those of the population with agricultural *hukou* even though they resided in the designated cities and towns.

When the third census was taken in 1982, the first 1953 census definition of urban population was revived because both the government officials and the scholars in China had realized that the 1963 definition was too limiting and might cause under-estimation on China's urbanization level. The pre-1982 statistical data series of urban population was readjusted by 1982 definition by State Statistical Bureau (SSB), PRC in 1984.

With the implementation of more relax criteria for establishing the designated cities and towns and the policy of "transforming a whole township into a designated town, a whole county into a designated city" after 1984, the number and area of designated cities and towns has kept growing rapidly. Correspondingly, the statistical data of urban population according to the 1982 definition increased fantastically. A large portion of this growth was not real but rather resulted from administrative/statistical changes. The majority of the new "new" urban population in the 1980s was agricultural in terms of occupation and household registration. For example, the increase in the total urban population between 1984 and 1989 was 243.8 million, 91% of which was "agricultural". In 1989, China's urbanization reached up to 50.9% according to the 1982 definition, but 63.1% of the urban population was agricultural. Obviously, this definition overestimated China's urbanization and would cause serious problems in socioeconomic analyses.

The fourth national census in 1990 tried to make some corrections and adopt another mid-way definition for urban population. Cities were divided into two types according to whether a city was further divided into urban districts or not. The urban population is

composed of: (a) all population, including agricultural and non-agricultural, of cities with urban districts, which is in line with the 1982 definition; (b) the non-agricultural population of designated towns and cities without urban districts, which is roughly in line with the 1964 definition. It should be noted that the temporary population (rural to urban migrants without the change of *hukou* status) with stays longer than one-year was included into the urban population. This is a compromise between over-reporting the population of the higher-level cities and under-reporting those of towns and lower-level cities. The total urban population reported in 1990 census was 296.5 million, 26.23% of the total population. Most Chinese scholars consider this aggregate data at national-level to reflect fairly well the real Chinese situation of urbanization.

Nevertheless, the rationality of this criterion has been challenged by the dynamics of urban development in China. One obvious problem is the non-standard designation of “urban district”. Some cities have established urban districts with extensive areas, which are far beyond the real spatial scope of urban clusters. For example, the former three counties of Tongxian, Shunyi, and Changping in Beijing have been transformed into urban districts. The newly established urban districts under such a transformation model may include remote suburban areas; hence a large part of the rural population who are actually employed in agriculture are accounted for as urban population. Clearly, such a transition pattern, which mainly refers to the administrative system, may undermine the rationality of the definition of urban population based on “urban districts”. Some studies showed that the 1990 census data of urban population at provincial-level are incomparable among one another, mainly because of the non-standard designation of “urban district” and the uneven-distributed of cities with urban districts (Y. Zhou and Y. Sun, 1992).

In the 5th 2000 national census, the 1990 census definition was further improved, mainly in the following two aspects: (1) Only and when in those urban districts, cities and towns with a population density higher than 1,500 persons per km², all population is regarded as urban population. As for urban districts with a population density lower than 1,500 persons per km², only the population that lives in streets, town sites, and adjacent villages is counted as urban population. For higher-level cities with large urban districts, the figures for urban population based on the 2000 census definition would be smaller than those on the 1990 census definition. On the other hand, for lower-level cities without urban districts and designated towns but with high population density, the figures for urban population based on the 2000 census definition would be much larger than those on the 1990 census definition. Thus, the 2000 census definition may greatly improve the comparability of statistical data at provincial-level. (2) Immigrants without *hukou* but who reside in cities and towns longer than 6 months, rather than one year in the 4th Census, are accounted as local urban population.

2.2.2 Various types of statistical data of urban population

Ma and Cui identified eight types of official statistical data published by Chinese authorities relevant to urban population (L. Ma and G. Cui, 1987). Figure 2 presents 3 series of statistical data of urban population that are most frequently used in China.

The upper one is the data series of the total city/town population based on the 1982 census definition. This series increased rapidly since 1982 and are much higher than other two data series. Because a large portion of this growth resulted from administrative/statistical changes, it cannot reflect the real situation of China's urban population and urbanization.

The lower one is data series of the non-agricultural population in cities and towns based on the 1963 census definition. Because the *hukou* system has been quite stable since 1962, it is historically consistent and spatially comparable. Therefore, some government agencies such as SSB, Ministry of Public Security and Ministry of Construction, etc., and many Chinese and international scholars prefer to use it to calculate China's urbanization level, in particular when conducting comparative analysis among various regions. However, this criterion cannot conceptualize the rapid growth of urban places and the expanding rural to urban migration without the change of the *hukou* system. Furthermore, China has begun to reform the rigid and unequal *hukou* system and intends to establish a new residence system allowing for free rural-urban migration in its "10th five-year plan". With China's entry into WTO, the *hukou* system is bound to be gradually abolished in the near future.

The medium one is the most recent official urban population data series published in the China Statistical Yearbook 2001 and adopted by the "China's Urbanization Development Strategies in the 10th Five-year Plan" drafted by the State Development Planning Committee, which is a mix of various data sources with different definitions: urban population data before 1982 are in the 3rd (1982) or the 1st (1953) Census definition while the urban population data in the period of 1964-1981 are transformed from data in the 2nd (1964) definition (non-agricultural population in cities and towns); urban population data in the period of 1983-1999 are in the 4th (1990) Census definition those in the period of 1983-1989 are transformed from data in the 3rd (1982) definition and those in 1991-1999 are estimated through annual sample population investigation; and the figure in 2000 is in the 5th (2000) Census definition. Apart from the years with national census, official urban population data at provincial-level or below are not available, though some efforts have been made to estimate them from the data series of non-agricultural population in cities and towns at provincial level in the period (Y. Zhou and Y. Sun, 1992; S. Wang, 1996).

Because different urban population definitions are used simultaneously, the official statistical data series is inconsistent in nature. The increase of urban population from 1999 (1990 Census definition) to 2000 (2000 Census definition) is 69.5 million, which is 9.7 times the average annual growth of urban population between 1990 and 1999 (9.7 million). However, the difference in urban population figures in the 1982 Census definition, and in the 1990 Census definition for the pre-1982 period, might be moderate because the areas of designated cities and towns were quite compact and the proportion of non-agricultural population to the total population in city/town proper were more than 70%. Some scholars proposed that all population within a city/town should be included as urban population on the 1990 Census definition when the proportion of non-agricultural population to the total population was more than 70% (Z. Zhang, 1989).

Considering the reliability and availability, the official statistical data series in the period of 1983-1999 (the 1990 Census definition) is for scenario analysis on future urbanization. However, the proposal scenario of urban population and urbanization level would be transform into the 2000 census definition because it is more reasonable. The 2000 Census data and the non-agricultural population data series will be used to conduct comparative analysis on spatial differentiation of urbanization in China.

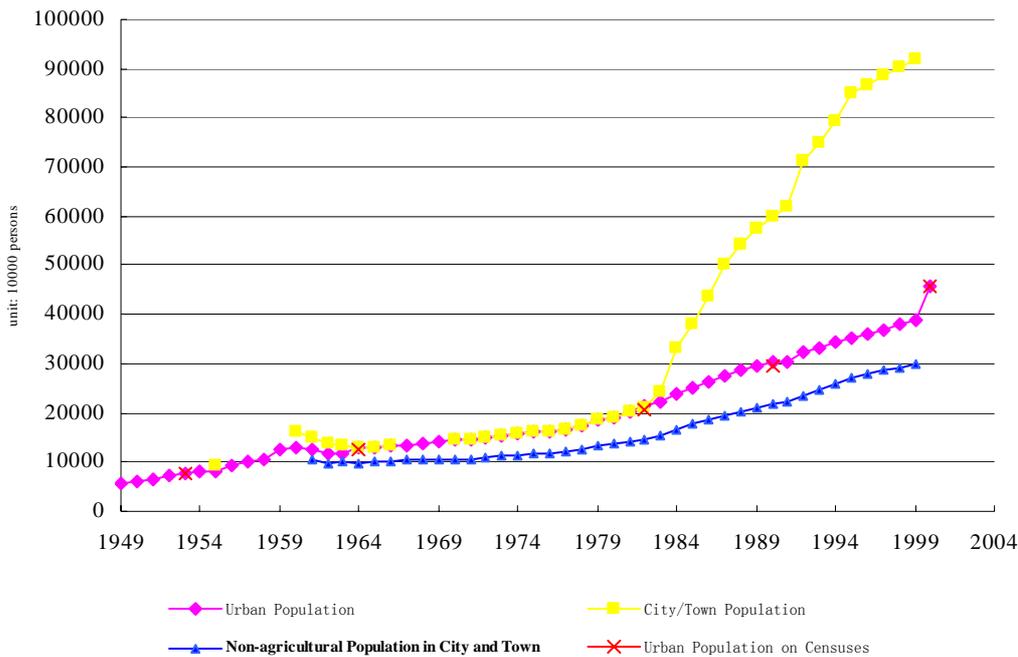


Figure 2. Comparison of urban population from different statistical criteria

- Data source:**
- 1) SSB, China Population Statistics Yearbook 2000, 2000.
 - 2) SSB, China Statistical Yearbook 2001, 2001.
 - 3) SSB, Major Figures on 2000 Population Census of China, 2001.

- Note:**
- 1) Military personnel is not included in the series of Census data, but is included as urban population in the other 3 series of data.
 - 2) Figures of city and town population are taken from the annual report of Ministry of Public Security and are based on administrative divisions.

3. The historical trajectory of China's urbanization and rural-urban migration in the past 50 years

From 1949 to 1999, China's urbanization level grew from 10.64% to 30.89 while the total urban population increased from 57.65 million to 388.92 million or by 6.7 times, and the numbers of cities and towns increased respectively from 132 to 667 and from 2000 to 19,184. However, as Figures 1 to 3 show, the historical trajectory of China's urbanization process and urban development in the past 5 decades is full of frequent fluctuations and 5 periods are readily discernible (Table 3).

3.1 The first fast and healthy urbanization growth period (1949-1957)

It covered the "Rehabilitation" (1949-1952) and the "First Five-year Plan" (1953-1957). On average, 5.5 cities were newly established and the annual growth of urban population was 5.23 million. Of which, rural-urban migrants were 2.44 million or accounting for 46.7% while the natural growth of urban population took up another 53.3%. Urbanization level was raised from 10.64% to 15.39%, or at the average increment of 0.59% per year.

3.2 The over-urbanization period (1958-1960)

It was primarily resulted from the social and economic development strategy of the "Great Leap Forward". The main motive of the "Great Leap Forward" was to increase China's production dramatically, particularly using its under-utilized human capital (Kim, 1988). In the three years, the average annual growth of urban population was 10.41 million or twice that of the pervious period (1949-1957), and the urbanization level dramatically rose from 16.25% to 19.75%, or at an average increment of 1.45% per year. In particular, the size of rural-urban migrants increased dramatically, the average annual growth of rural-urban migrants was as high as 8.26 million or 3.4 times that of the pervious period. The over-rapid urbanization resulted in the sharp decline of the amount of grain available to the urban population, with a reduction from 303 kg per person to 216 kg per person. During this period, about 7.67 new cities on average were constructed each year.

3.3 The first anti-urbanization period (1961-1965)

As the country's economy, particularly agriculture, experienced tremendous hardship during the former "great leap forward", the main tasks of period were "readjustment, consolidation, filling-out and raising the standards" (J. Kim, 1988). The criteria for city and town designation were raised and a large amount of surplus urban population was deported into rural areas. It is estimated that around 18 million urban employees or 26 million urban population were laid-off while the majority of them were deported into rural areas (J. Sun, 1996; X. Xu, et al, 1999). In this period, the number of designated cities decreased from 208 in 1961 to 168 in 1965 and the net urban-rural migrants (after reducing the size of rural-urban migrants) were more than 9 million. Therefore, the total urban population in the end of 1965 was even a bit less than that in the beginning of 1961 and the urbanization level declined from 19.75% in the beginning of 1961 to 17.98% in the end of 1965.

3.4 The 2nd anti-urbanization period (1966-1977)

In the beginning of Great Proletarian Cultural Revolution, the large-scale movement of “going to the rural and mountainous areas” was promoted by China’s government aiming to re-educate intellectuals and urban youths and in part to maintain social stability and to alleviate ongoing problems of urban unemployment. It was estimated that more than 16 million urban youths and 3-5 million intellectuals and cadres were deported to rural areas (J. Sun, 1996; X. Xu, et al, 1999). However, the movement of “going to the rural and mountainous areas” gradually came to stop in 1971 and the rural to urban migrants began to increase. In summary, the urban population grew at the modest rate of 3 million per year and primarily by natural growth, which accounted for 61.25%; the urbanization level marginally decreased from 17.98% in the beginning of 1966 to 17.55% in the end of 1977.

3.5 The 2nd rapid urbanization period (1978-1999)

Since the adoption of its well-known reform and open-door policies in 1978, China has experienced dramatic economic growth in the last decades. From 1978 to 2000, China’s GDP increases 7.4 times with an average growth rate of 9.6%. Correspondingly, China’s urbanization has entered a rapid and healthy growth period. On average, 21.68 cities were newly established and the annual growth of the urban population was more than 10 million. Of which, rural-urban migrants were 7.36 million or accounted for 72.87% which is completely different from the growth pattern dominated by natural growth in the 1st fast urbanization period of 1949-1957. Urbanization level rose from 10.64% to 15.39%, or at the average increment of 0.59% per year. Thus, the urbanization level increased from 17.92% in 1978 to 30.89% in 1999, with an annual increment of 0.61 percent.

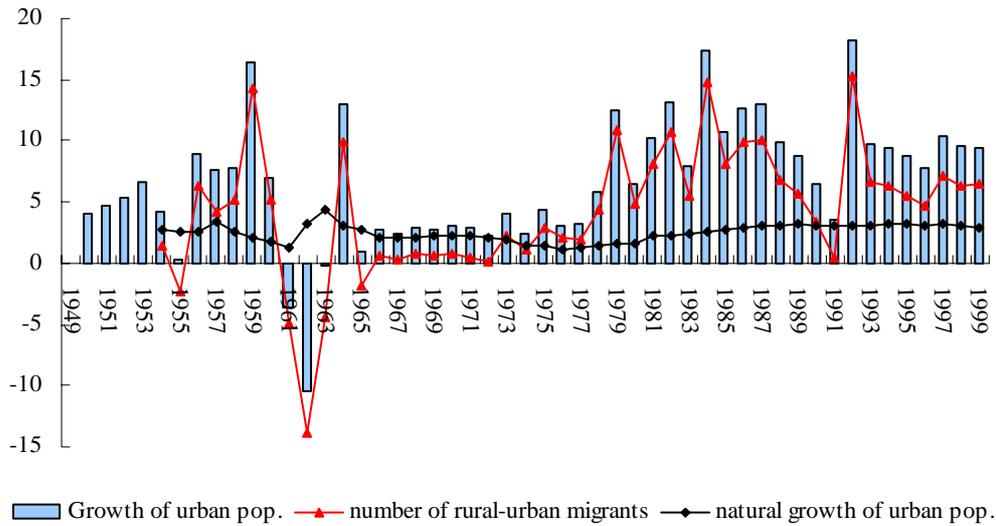


Figure 3. Historical trajectory of urban population growth in 1949-1999

Data source: SSB, 2002, China Statistical Yearbook 2001
SSB, 1989, China Statistical Yearbook 1988

Note: The natural growth rates of urban population in the periods of 1967-1970 and 1982-1988 were absent and were respectively substituted by the average valued of natural growth rates of 1966 and 1971, and 1981 and 1988.

Table 3. Historical periods of China's urbanization process in 1949-1999

Period	Annual growth of urban population (million)						Annual growth of urbanization level %	Annual growth of cities
	Total		Natural growth		Rural-urban migrants			
	Number	%	Number	%	Number	%		
I. 1949-1957	5.23	100	2.79	53.30	2.44	46.70	0.59	5.50
II. 1958-1960	10.41	100	2.16	20.70	8.26	79.30	1.45	7.67
III. 1961-1965	-0.06	100	2.95	-	-3.01	-	-0.35	-6.20
IV. 1966-1977	3.00	100	1.90	63.41	1.10	36.59	-0.05	1.82
V. 1978-1999	9.80	100	2.68	27.31	7.13	72.69	0.58	20.83

4. The characteristics of China's historical trajectory of urbanization

Under the special political, social and economic circumstances, the historical trajectory of China's urbanization in the past five decades is unique in the world. Examining its characteristics and experiences would produce valuable implications on its future development trends.

4.1 China's urbanization and urban development have been heavily regulated and controlled by governmental policies.

China's urbanization and urban development have been heavily regulated and controlled by the State government. It is observed that China had deliberately adopted a series of "anti-urbanization" policies measures to "economize" on urbanization without negatively affecting industrialization (K.W. Chan, 1989). This could be identified from the following aspects:

- (1) In China rural-urban migration had been an area of heavy state control in the pre-reform era and active regulation at the present (K.W. Chan, 1999a). Unlike population registration systems in many other countries, the Chinese *hukou* (household registration) system was designated not only to provide population statistics and identify personal status, but also directly to regulate population distribution and serve many other important objectives desired by the state (K.W. Chan, 1999b). Rural-urban migration is regulated by tight controls on employment opportunities, the household registration (*hukou*) system and rationing of grain and other products.
- (2) Rural industrialization policy has been actively adopted to limit rural to urban migration, which will be discussed more detailed later in the section.
- (3) Investments on urban development and infrastructure construction were primarily allocated by the higher level government according to the national economic and industrial development planning.
- (4) The definitions on urban places and urban population were changed corresponding to government policy priorities at different period.
- (5) The unique urban development policy focused on different treatments for different city sizes, rather than on urban management.

By 1989, a unique policy to "tightly control the growth of large cities and actively promote the development of medium and small-sized cities" was enacted as Chinese urban development law. There were several reasons for carrying out such a policy for Chinese central government:

- (1) The ideological barrier. As a socialist country led by the Chinese Communist Party, the Chinese central government pays great attention to its ultimate ideological target of eliminating three disparities (i.e., the disparities between industry and agriculture; urban and

rural; and intellectual and labor) through comprehensive development. Thus by applying its unique urban policy, China attempts to achieve a more balanced regional urbanization in the country and to reduce the gap between urban and rural areas. The excessively fast growth of large cities without the boom of small cities and rural areas, as seen in the most developing countries for the last decades, is obviously against China's ideological principles.

(2) Concern of social stability. Social stability is always the prime concern of government and in such a large country as China. By looking at the disadvantages of many big cities in other developing countries, such as increasing crime, squatters, and the lack of security, the Chinese government is very cautious about relaxing the *hukou* system, especially for large cities. To them, the flood of rural migrants to big cities may have serious implications in terms of social stability. The "rural labor tide" (*min gong chao*) of the late 1980s in China remains in the mind of the government providing a warning.

(3) Concern of difficulty in management. There is a general belief that the larger a city, the more complicated it will be in organization, especially in transportation, infrastructure construction, environment protection, and the like. Therefore, it is not so easy to foster the rapid growth of big cities, particularly in a relatively poor country like China.

(4) Doubt the efficiency for big cities. There appears to be general agreement that large cities usually are more economically efficient than smaller ones, according to the international experience. Yet up to now, there is no convincing proof if all factors are included. It is argued by some that the high economic performance of large cities might depend upon their disproportional large investment, larger autonomous power in decision-making, and their heavy exploitation of other cities due to their advantage in high-technology equipment. If the large cost in maintaining the infrastructure and the environmental protection is carefully evaluated, the conclusion might be different. The good performance of small cities and towns in China in the 1980s appears to support this argument.

4.2 China has been relatively under-urbanized compared to its level of industrialization or to other developing countries at similar stages.

China's urbanization level has always been lagging behind its industrialization level, as Figure 4 shows. In 2000, the GDP per capita in China reached up to 7080 *yuan* RMB or about 850 US dollars, and the share of the secondary and tertiary industries to the composition of the GDP and total employees is respectively 84.1% and 50% while the proportion of urban population to the total population is relatively low, only 36.09%. According to World Bank, the urbanization level in other developing countries with lower-medium income was in 2000 on average 42%, which is much higher than that of China (World Bank, 2001).

China's low level of urbanization is just a case of systematic under-urbanization in planned-economy countries (M. Ran and B. Berry, 1989). In order to achieve maximum capital accumulation and industrial growth, the Chinese government used a series of measures control urban growth. Those "anti-urban" policy measures had been temporarily effective in fostering rapid industrialization and economic development at the minimum costs or investments in 1980s and even at the early of 1990s at the initial stage of China's economic take-off and Chinese had been proud of its unique mode of modernization with Chinese characteristics. However, with the transformation from a seller's market to a consumer's

market and the weakness of consumption demand since the middle of 1990s, particularly after the Asian Financial Crisis, the serious negative impacts of under-urbanization began to be widely recognized. The lower level of urbanization is considered to be an important constraining factor in China’s economic development, whose adverse impacts may include: more and more serious human-land relationship, minor scale and low efficiency of agriculture, weak domestic consumption demand and constraints on the tertiary industry development, disorderly growth of small towns, “amphibianization” of the redeployed labor force and deterioration of resources and environment, etc. (W. Li, 2001; K. C. Tan, 1993). Many Chinese scholars therefore consider the lower level of urbanization to be an important constraining factor on China’s economic development and the growth of urbanization is the center of China’s economic development in the next phase (X. Hu, 2000a; G. Fan, 2001).

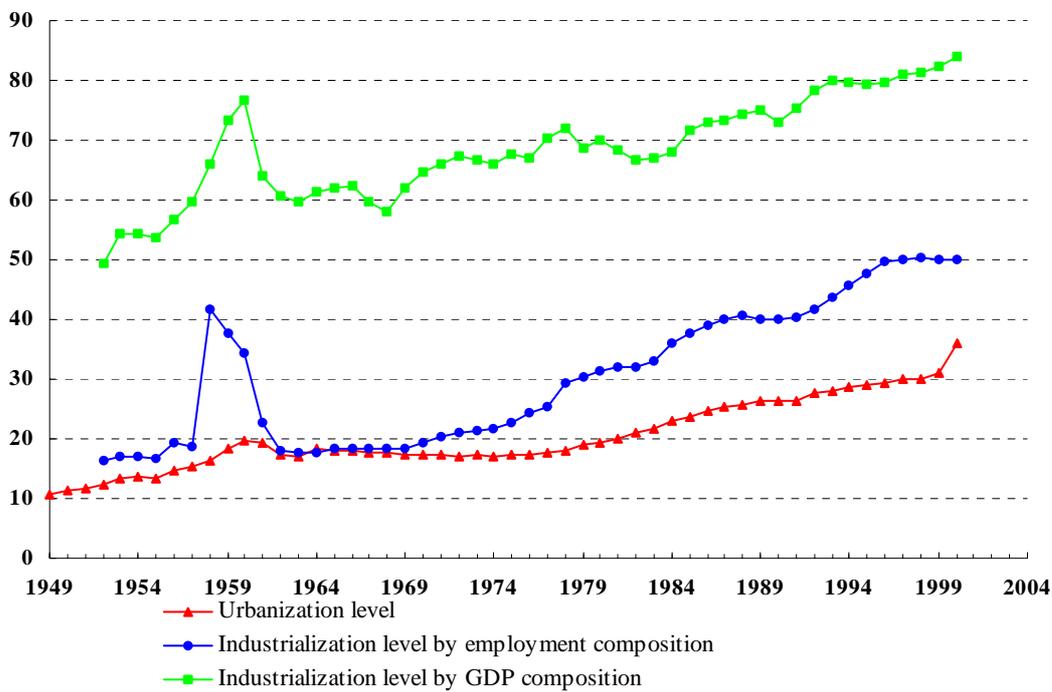


Figure 4 Gaps between urbanization and industrialization in 1949-2000

Data source: SSB, China Statistical Yearbook 2001, 2001.

4.3 The rural urbanization policy has been actively adopted to limit rural-urban migration toward cities.

Rural urbanization policy was developed under the vigorous pushing force of rural reform and the inflexible resistance from the lagging urban development. With the implementation of household responsible system, rural unemployment or underemployment, caused by dual urban-rural *hukou* system but formerly masked by the collective commune system, became more visible. A large amount of rural labor, 60-100 million or 20 to 30% of the rural labor force, was considered “surplus” in relative to land resources, that is, not needed in agriculture. It is essential to transform those surplus rural laborers from the primary to the secondary and the tertiary sectors. However, Chinese cities were not ready to absorb this rural population and the dual urban-rural *hukou* system was still maintained. Thus, rural communities and laborers were encouraged to establish Township and Village Enterprises (TVEs) and to create non-agricultural employments by using their own resources (land, capital, labor, etc.). Figure 5 shows that the TVE employees increased from 32.25 million in 1983 to 135.08 million in 1996 or by 4.2 times. At the most rapid growth period of 1984-1988, TVEs annually created 12.62 million new jobs on average accounting for 93.36% new non-agricultural employment opportunities for rural laborers. The second rapid period was in 1992-1996, the annual growth of TVE employees on average was 7.8 million, and contributed 94.64% to the total rural laborers transformed to non-agricultural sectors (Table 4).

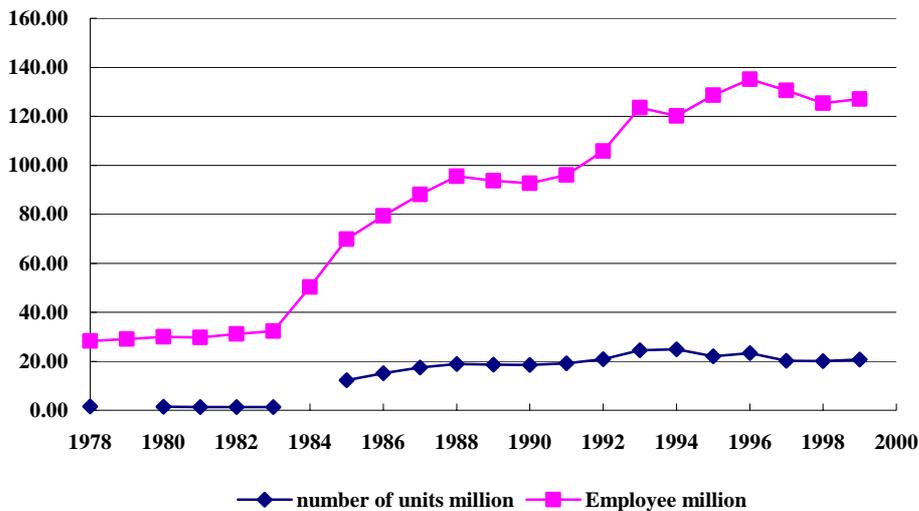


Figure 5. Development of TVEs in 1978-1999

Table 4. Average annual growth of TVE employees and its contribution share

Periods	Average annual growth of TVE employees (million)	Average annual growth of rural non-agricultural laborers (million)	Contribution share of TVE %
1978-1983	0.82	-	-
1984-1988	12.62	13.52	93.36
1989-1991	0.21	2.59	8.19
1992-1996	7.80	8.24	94.64
1997-1999	-2.68	3.19	-84.03

TVEs are interested in employing local rural laborers because they can greatly reduce their operation costs without the need to provide dormitories for employees. Take the Chengdu Ninliang Industry Limited Company situated on the Anren township in Dayi County, Sichuan province for example. Among its 368 employees, 41 come from the local township seat, accounting for 11%; 268 from local villages administered by the Anren township, accounting for 70%; 36 from other townships in Dayi county, for 10%, while only 9% (35 employees) come from other counties of Sichuan province. Apart from that, almost all employees in service sectors at the 4 case-study towns in Chengdu municipality, are from the local township. Those local rural populations work at enterprises or do business in the towns during the daytime, and usually return to their home inside rural villages at night. Thus, they are usually called “swing population”. After a period of time, those “swing population” may choose to settle down at the small town when their business run well or their jobs become stable (S. Liu, 2000).

This model of surplus rural labor transformation is widely known as “leaving the soil but not the village, entering the factories but not the cities” (*li tu bu li xiang, jin chang bu jin cheng*). Those rural laborers have changed their employment status from the agricultural to non-agricultural sector but still reside at their village home. It is also called as rural-urban interaction or potential urbanization in the literature (J. Shen, 1995; S. Wang, 1996). In 1980s, the majority of surplus rural laborers were transferred to non-agricultural sectors through this mode of “leaving the land but not the township”, Huang estimated that it accounted for 85.2% (W. Hu, 1999). However, in the late 1990s (1997-1999), the vigor and competitiveness of TVEs began to decline. More TVEs went bankrupt than were established and TVE employees decreased at the rate of 2.68 million each year. Therefore, surplus rural laborers had to move further away to cities and towns to look for jobs, and another mode of “leaving both the land and the villages” (*li tu you li xiang*) became predominated, which resulted in a massive labor exodus from the countryside, called “waves of rural labor” or “*mingong chao*”.

This kind of urbanization in rural areas, as triggered by TVE development, has helped promote the growth of rural economy, provide urban facilities in rural areas, speed up the growth of local small towns, and simultaneously keep farmers from flooding into cities. It is significantly different from the current wave of urbanization that depends on the development of cities, which attracts more and more rural-urban migrants to work there, and is generally called rural urbanization. Given the huge amount of surplus rural labor force and the serious

under development of Chinese cities, rural urbanization has been considered as the most appropriate Chinese model for urbanization. The Central Committee of Chinese Communist Party (CCCP) and the State Council announced that:

“rural enterprises ... are an effective way to establish a new style of rural-urban relation ... should be actively encouraged” (Zhonggong Zhongyang, 1986)

The adoption of rural urbanization makes the role of small cities in urban system became more and more important in China. The non-agricultural population in small cities was 11.81 million in 1980, accounting for 13% of the national total of non-agricultural population in cities. This figure increased rapidly in 1980s to 32.36 million, in 1990 it grew by 2.7 times while its share of the national total reached 21.52%. However, its growth rate began to slow down gradually in the 1990s.

However, with the progress of China's economic development, the transformation from a sellers' market to a consumers' market and the effects of increasing economic globalization, a number of serious and unsustainable problems of this rural urbanization model began to emerge in the mid-1990s. These included extreme fragmentation and decentralization of rural industries in small towns, the serious lag in rural laborers' residential migration to their occupational shift, over-encroachment of cultivated land and deterioration of the rural environment, etc. These problems have drawn more and more attention from entrepreneurs and the public. Especially the TVEs in the Pearl River Delta and the Yangtze River Delta with a developed economy are transforming from a labor-intensive to a capital and technology-intensive enterprises now. Scaled economy, agglomeration benefits and sustainable development have been put at the top of the agenda. Since the mid-1990s, the development of TVEs is encouraged to combine with the construction of small towns through the establishment of industrial parks in major towns such as at the county seats, in order to promote urbanization.

4.4 The rapid urbanization regions have transformed into the southern and eastern coastal areas in the latest 20 years and 4 city-and-town concentrated areas have been formed.

When comparing the spatial pattern of China's urbanization over the latest 20 years, since the implementation of the “open-door” and economic reform policies, to that in the former phase of planned economy, it is obvious that the most rapid growth regions of urbanization have shifted from the former northern inland areas to the southern and eastern coastal areas. Figure 6 demonstrates the change of each province's contribution to the total national growth of urban populations between the periods of 1954-1980 and 1980-2000. In the former period of 1954-1980, the major contributors with more than 4% share were the 10 provinces of Heilongjiang, Sichuan, Liaoning, Shandong, Jilin, Henan, Hubei, Inner Mongolia, Jiangxi, and Guizhou. Apart from Shandong, the other 9 provinces are situated in the inland areas, particularly in the northern part, while the Shanghai's contribution was only 0.04%. However, in the later period of 1980-2000, the major contributors have shifted to Guangdong, Shandong, Jiangsu, Sichuan, Zhejiang, Hubei, Henan, and Hunan provinces. The most important contributor, Guangdong province, alone accommodates 14.45% of the nation urban

population growth in this period, which is 3.8 times the contribution of the former period. The four provinces located in the southern or eastern coastal parts, Guangdong, Shandong, Jiangsu and Zhejiang, account for nearly 40% of the national urban population in this period, which is 2.6 times that in 1945-1980. Corresponding, the shares of former major contributors located in the northern inland area, such as Heilongjiang, Liaoning, Jilin, Inner Mongolia, decrease substantively.

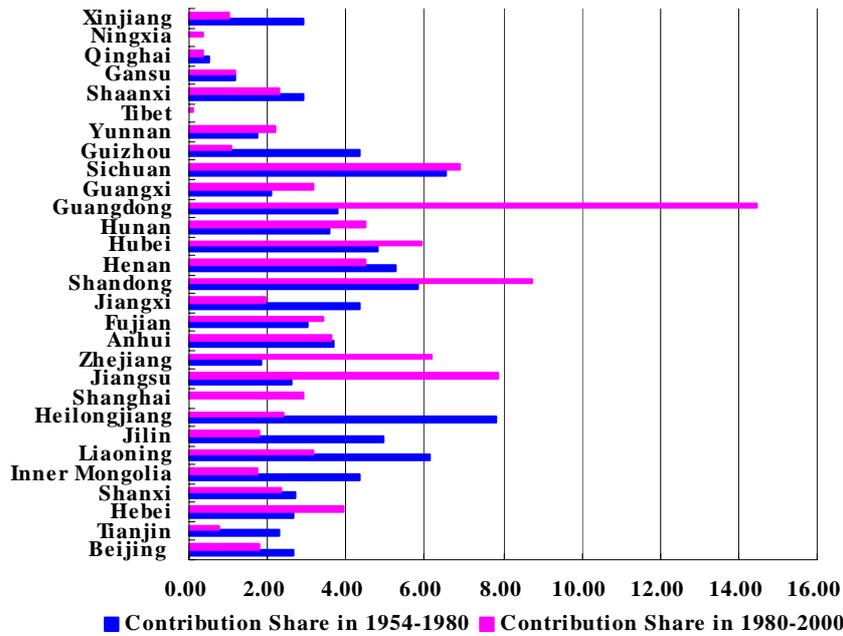


Figure 6. Change of each province’s contribution to the total national growth of urban population between the periods of 1954-1980 and 1980-2000

As Figure 7 shows, in the period of 1945-1980, most of the provinces with rapid increases are situated in the northern inland while those with decreases or fast decreases are located in the southern and eastern coastal provinces. The spatial pattern is in verse in the period of 1980-2000, the shares of southern and eastern provinces to the total national urban population increased and become the rapid urbanization regions while the northern inland provinces lost their shares.

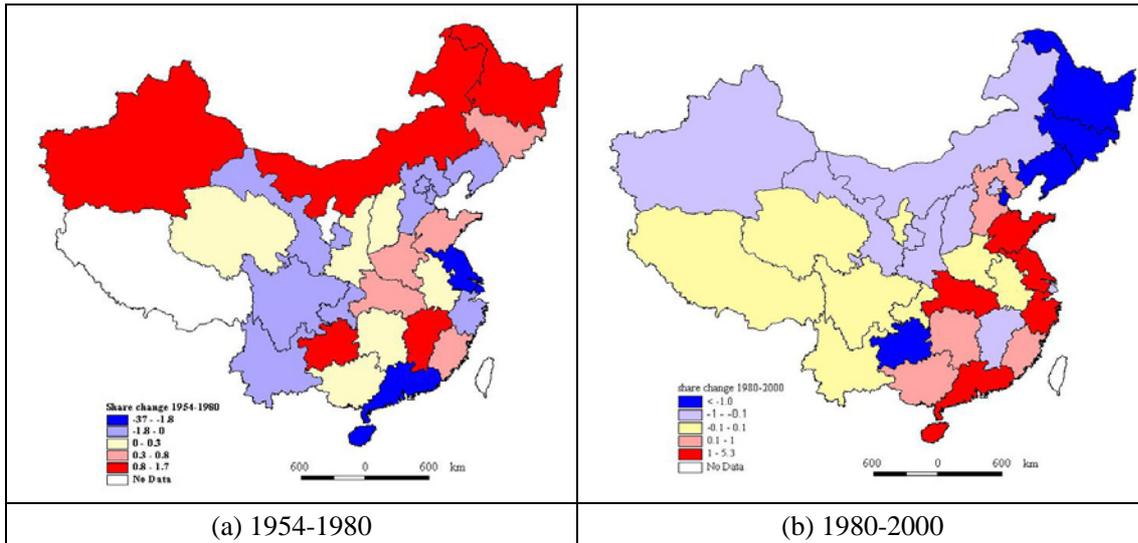
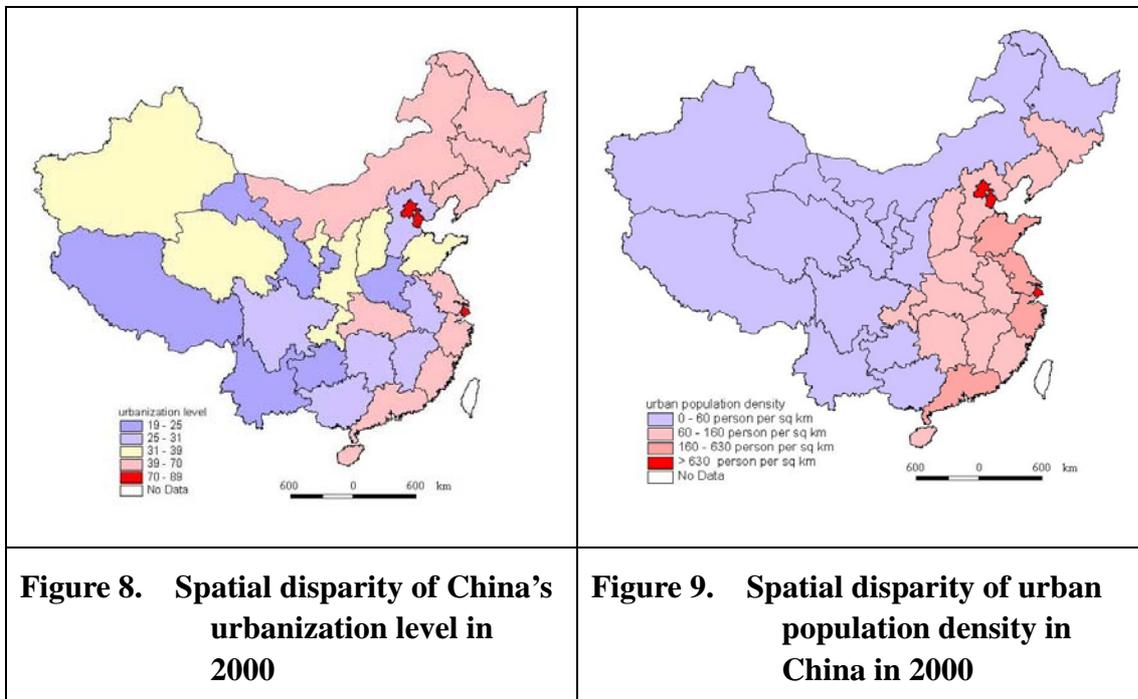


Figure 7. Changes in Provinces' share of urban population growth to the total national

Figure 8 and Figure 9 show the spatial disparity of China's urbanization level and urban population density at province-level in 2000. Generally speaking, the urbanization level and urban population density decline from the eastern coastal areas to the western inland areas. The 3 municipalities directly under the State Council's jurisdiction, Beijing, Tianjin and Shanghai, are currently highly urbanized areas with an urbanization level of more than 70% and an urban population density of more than



630 persons per sq. km. The urbanization level and urban population density of Guangdong province are quite high (55% and 267 persons per sq. km) and its contribution to the national urban population growth was extremely high in 1980-2000 (Figure 9).

Urban growth has polarized over the last 20 years and three concentrated areas of cities and

towns have been formed, the Pearl River Delta, the Yangtze River Delta and the Beijing-Tianjin-Tangshan area. Apart from these, the fourth concentrated city-and-town area has developed in the central and southern Lioaning Province over the last 20 years. Since the founding of the People’s Republic of China, this region has been a long-standing important industrial base and has undergone successively intensified construction under the planned economy while its coastal cities such as Dalin and Yingkou have developed at a relatively fast rate since the reform and opening-up policies in 1978. The share of urban population and GDP in the four city-and-town concentrated areas to the national totals are respectively 30% and 31% in 1995 (X. Hu, 2000b). However, even among the 4 city-and-town concentrated areas, their urban population growth rate is significantly different, as Table 5 shows. The annual growth rate of the urban population in the Pearl River Delta was 9.3% in 1982-1995 and 13.9% in 1991-1995, respectively 2.4 times and 4.5 times of the national average while those in the Central and Southern Lioaning Province were even smaller than the national average.

Table 5. Growth Rate of Urban Population in the 4 City-and-Town Concentrated Areas 1982-1995

Growth Period	Pearl River Delta	Yangtze River Delta	Beijing-Tianjin -Tangshan Area	Central and Southern Lioaning Province	National
1982-1995	9.3	5.1	3.6	3.0	3.9
1991-1995	13.9	6.2	5.7	2.6	3.1

After X. Hu, 2000b, pp.26.

5. Rural-urban migration: types, driving forces and social-economic features

5.1 China’s *hukou* system and its impact on rural-urban migration

In China rural-urban migration has been an area of heavy state control in the pre-reform era and is actively regulated at the present (K.W. Chan, 1999a). Unlike population registration systems in many other countries, the Chinese *hukou* (household registration) system was designated not only to provide population statistics and identify personal status, but also to directly regulate population distribution and serve many other important objectives desired by the state (K.W. Chan, 1999b).

China’s *hukou* system was first set up in cities and extended to rural areas in 1955. In the early years of the system, it served largely as a monitoring rather than a control mechanism of population migration and movement. In fact, the early 1950s was a period of relatively free migration in to and out of the cities in China. However, as influxes of farmers into cities escalated and began to be a serious burden in the late 1950s, the Chinese government tried various administrative measures to stop “blind” rural-urban migration in which the dual rural-urban *hukou* system was a very important mechanism. In December 1957, the CCCP and the State Council issued the “Directive On Stopping the Blind Flow of Rural Labor”, in which various levels of government agencies were required to use the *hukou* management system to strictly control urban population and block rural-urban migration. In January 1958,

“The PRC Statute for *Hukou* Registration ” was promulgated by the National People’s Congress. The 10th Item of this Statute explicitly stipulated that (J. Sun, 1996):

“All immigrants from rural to urban have to hold the recruitment certificates from Labor Departments or enrollment certificates from schools or the entrance permission from urban hukou registration authorities”.

Since then the *hukou* system classifies all the people either as “agricultural population” or “non-agricultural population” and different *hukou* status indicate different benefits and securities provided by the State to the residents rather than different occupations, that in fact is the real power of the *hukou* system in regulating migration. The government assumes the responsibility to provide jobs, housing, education, social and medical services, and certain supplies of daily necessities for the “non-agricultural population” while the registered “agricultural population” do not have any of these benefits and opportunities. In order to maximize industrialization and to minimize financial responsibility, the conversion from the “agricultural” to “non-agricultural population” status is subject to strict and simultaneous “policy” and “quota” controls. In the pre-reform era, the *hukou* system functioned as a de facto internal passport mechanism (K.W. Chan, 1989) and almost completely controlled rural-urban migration because the state monopolized economic activities, job recruitment, and the distribution of important goods. Most of this type of migration was reserved for bringing in the necessary labor force in support of state-initiated industrialization programs. Migration to cities was only a dream to an ordinary farmer.

With the introduction of reform and opening, the former planned economy has transformed into a market-oriented economy. Tremendous non-agricultural employment opportunities have been created in non-state-owned TVEs and private companies and foreign or joint ventures. Grains and almost all kinds of commodities are available from markets at reasonable prices. People have more flexibility to choose where to work and reside no matter what their *hukou* status is. Population mobility in China has risen dramatically and has formed the most notable “*mingong chao*” or “waves of rural labor”, which is most obvious in major cities such as Beijing, Guangzhou, Shanghai where large numbers of “floating population” from countryside congregate. The increased population mobility has greatly challenged the very basis of the traditional *hukou* system and has forced the government to adjust its policies. Important reforms on the *hukou* system are:

- **Population with “self-supplied food grain” in market towns.** In order to alleviate the pressure of surplus rural labor force, the State Council issued a document to allow farmers and their families to run businesses or undertake industrial or commercial activities in rural market towns. Farmers were allowed to apply for a new type of urban *hukou* in rural market towns, called “self-supplied food grain” *hukou*, provided that they satisfied the following requirements: (1) they have businesses or jobs at the market town; (2) they have their own accommodation in the market town; (3) they make their own food grain arrangement. This kind of “self-supplied food grain” *hukou* opened a new channel for rural-urban migration at the bottom level of urban system. However, it

was only locally valid at the specified towns and holders were not eligible for state-subsidized welfare. Thus, it lost its popularity at the late 1980s when new opportunities for urban *hukou* became available.

- **Temporary Residence Certificate (TRC).** In 1985, the Ministry of Public Security issued a new set of regulations on applying for urban TRC for people without local *hukou* registration. The new regulation tacitly allows rural immigrants to seek jobs and get temporary residence permits in cities but they are required to apply for TRC from local public security authorities. A TRC is usually valid for one year and is renewable. TRC holders are not eligible for state-subsidized welfare and urban social security but have to complete some cumbersome registration paperwork and to pay administration fees. Therefore, a large amount of rural migrants neglect to register with MPS after their arrival. According to MPS, it is estimated that there was a floating population of some 80 million in 1995 of which only 44 million held registered TRC.
- **Hukou reform in towns and county-level cities.** After two years of experiments on *hukou* reform at 450 pilot towns and small cities, the State Council approved the MPS's report of "Guidelines on Promoting the Reform on *Hukou* Management System at Small Cities and Towns" at the beginning of 2001. In this guideline, the state decided to completely open the urban *hukou* at county-level cities and designated towns without quota control, provided that the applicants meet the following conditions: (1) they have stable non-agricultural jobs and stable living support; (2) they have their own accommodation in those selected cities and towns. Successful applicants are not required to pay any kinds of entrance fees (such as infrastructure construction fees) to the local city government and can enjoy the same rights and welfare benefits as local regular urban residents in respect to education, employment and social security, etc. One special feature of this guideline is that rural migrants are allowed to keep the land at their home village. This guideline has significantly promoted the growth of urban population. For example, the three-year *hukou* reform in small cities and towns in Zhejiang province (pilot scheme) has resulted a net increase of 1.9 million in urban population.
- **Recent trends and prospect of *hukou* reform.** Recently the pilot scheme of *hukou* reform has been extended to county-level small cities, to medium and large cities at vice province-level, such as Shi Jia Zhuang, Changsha and Chengdu - the capitals of Hebei, Hunan and Sichuan provinces. Further, Hunan and Guangdong provinces have announced the abolishment of the traditional dual *hukou* registration system of "agricultural" and "non-agricultural" and to adopt a new system based on actual place of residence. A set of entrance-permission requirements is used to justify the application of immigration instead of quota control. In essence, the reforms on the traditional rural-urban dual *hukou* system have gradually relieved the constraints on rural-urban migration and helped promote population mobility and urbanization. Though the entrance-permission requirements for applying an urban *hukou* in Chinese large cities, particularly in those directly under the State Council's jurisdiction such as Beijing,

Shanghai and Tianjin, are currently very high or selective, a free rural-urban migration system is expected to come in the near future (Beijing Youth, September 28, 1001).

5.2 Types of rural-urban migrants and their sizes

Migrants with or without a local *Hukou* face starkly different opportunities, constraints and warfare benefits because the *hukou* system has long been intensively integrated with the economic and social systems in China. Considering the significance of the *hukou* status to the social and economic contours of the migrants, it is reasonable to classify China's rural-urban migrants based on whether or not local *hukou* is conferred on the migrant. Hence, two types of rural-urban migrants are differentiated: (1) Rural-urban migration with local residency (*hukou*) rights (*hukou* rural-urban migration); (2) Rural-urban migration without local residency (*hukou*) rights (non-*hukou* rural-urban migration). It should be noted that the local rural-urban transaction through the model of "leaving the land but not the villages" (*li tu bu li xiang*) are excluded because rural laborers usually work at nearby TVEs within the township and county and reside in their village home with residential migration. Even though this mode was predominant in the 1980s and made very important contributions to transferring surplus rural labor force. According to SSB's sample survey in 1998 on the number of 0.18 million rural laborers at 60 thousand households, 800 counties and 30 provinces (hereafter referred as SSB sample survey on rural labor in the surveyed year), a total number of 28 million rural labor were transformed into the secondary and tertiary industries in this year, of which 11% or 3.1 million rural labor in various TVEs. Among of those, 63.2% were employed by TVEs located within the township, 17.6% within other townships of the county, only 19.2% in other counties of the province and other provinces (X. Fan, 1998).

Before 1990, only the first type was accounted into the growth of urban population while non-*hukou* rural-urban migration were still accounted as agricultural population even though they might have resided in cities for several years. The 4th national Census in 1990 made a great improvement in the aspect. Those non-*hukou* rural-urban migrants who had resided at cities and towns for more than year, were considered as urban population. The 1% sample population survey in 1995 and the 5th National Census in 2000 further relaxed the standard to include those non-*hukou* rural-urban migrants who have resided in cities and town for more than a half-year. Unfortunately, this paper has to use migration data from the 4th Census in 1990 and 1% sample survey in 1995 because those from the 5th Census in 2000 is not yet available.

From 1980s to the early 1990s, the size of rural-urban migrants was on the decline. In the 4th National Census, a total number of 34.09 million cross-county migrants were recorded compared to July 1985 while those migrants within the same county or county-level city were neglected.

The proportions of its four components, rural to urban, urban to urban, rural to rural and urban to rural, were respectively 49.04%, 33.65%, 13.44% and 3.87% (Figure 10(a)). The 1995 1% sample survey population data stated that the total number of cross-county migrants was 33.23 million compared to October 1990 and the shares of its four components were

respectively 35.95%, 35.49%, 23.80% and 4.76% (Figure 10(b)). Compared the Figure 10(a) to Figure 9(b), it is observable that the share of rural to urban declined sharply from 49% to 36% while the share of rural to rural increased rapidly from 13% to 24% from the late 1980s to the early 1990s. Corresponding, the number of rural to urban migrants declined from 16.72 million to 11.95 million (also see Table 6) and the number of rural to rural migrants increased from 4.58 million to 7.91 million. This means that it was much more difficult for rural migrants to seek jobs or to make a living in cities and towns in the early 1990s than in the 1980s and they therefore had to migrate into more developed rural areas. On one side, it resulted from economic austerity, large-scale laying-off of workers from state-owned enterprises and the rising local protectionism on limiting employment opportunities to rural migrants in cities. On the other side, in the rural areas in the developed eastern coastal regions there is a strong demand for cheap laborers due to rapid growth of TVEs and the high degree of non-agricultural employment. A large number of rural laborers from the middle and western regions were employed to engage in the agriculture sector and low-level non-agricultural jobs in the eastern coastal region. According to SSB's sample survey in 1998, about 0.59 million rural laborers were employed in agriculture in other regions rather than their home township.

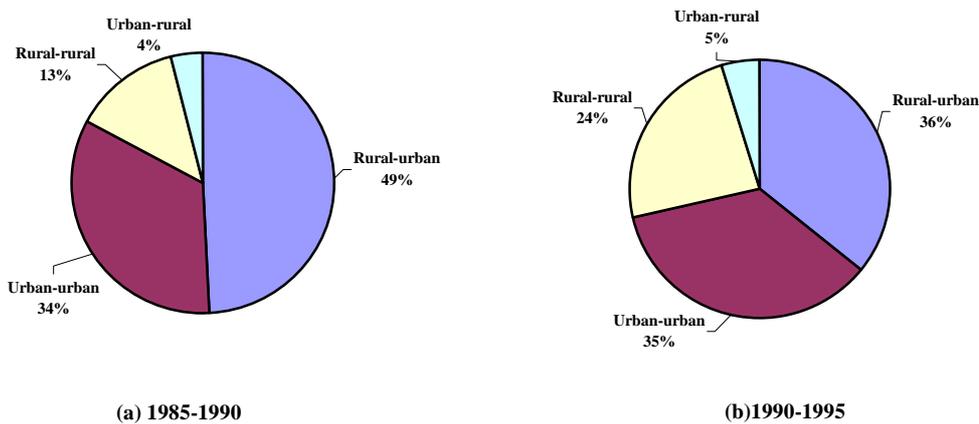


Figure 10. The composition of different types of migrants in China

From Table 6 we can further find out that the destinations of rural-urban migrants had moved upward from towns to cities from 1980s to the early 1990s because the proportion of rural-urban migrants to cities increased from 46.33% to 84.52% while that to towns declined from 53.67% to 15.48%. This can be explained for the following reasons: First, cities usually provide more non-agricultural employment opportunities to rural migrants than small towns, which are dominated by the “leaving the soil but not the village” mode. Second, the progress of the *hukou* system reform has greatly relaxed the conditions for rural migrants to cities. Third, a large number of towns have been promoted into cities. Fourth, county is the basic spatial unit of this set of data, therefore the amount of migrants from the rural areas to towns within the same county is neglected. It is estimated that the size of rural-town migrants within the same counties was 4.96 million in 1985-1990, based on township-level data (R. Zha, 1996).

Table 6. The size of rural-urban migration in China 1982-1995 (unit: million)

Time Period	Rural cities		Rural towns		Rural-urban (Total)	
	Size	Share	Size	Share	Size	Share
1982-1987	6.95	46.33	8.05	53.67	15	100
1985-1990	12.66	75.72	4.06	24.28	16.72	100
1990-1995	10.1	84.52	1.85	15.48	11.95	100

Data Source: 1% sample population survey in 1987 and 1995; the 4th National Census

However, from the Statistical Data on Temporary Registered Population (TRP) of MPS, and the 5th National Census data it can be derived that the size of rural-urban migration is on increase since the late of 1990s. The total TRP in cities increased from 32.06 million in 1999 to 37.91 million in 2000, i.e., by 5.85 million or 18.25%. Among of the TRP in cities in 2000, 22.57 millions were engaged in industrial activities, 1.09 million in agriculture, 5.02 million in businesses, 3.41 million in the service sectors, 0.16 million in house-keeping, the other 5.66 million in diverse bundle activities including tourists, business trips, education, visiting friends, etc. It is reasonable to believe that the majority of those TRP in cities in industrial, agricultural, business, services and house-keeping are actually rural-urban migrants. The total of those categories was up to 32.55 million in 2000. The 5th Census recorded a total of 121.07 million cross-township immigrants without *hukou* (but residing there for more than 6 months). Among of those, 73% or 88.4 million were from rural areas while 74% or 90.12 million migrated into cities and towns.

In order to calculate the sizes of *hukou* and non-*hukou* rural-urban migrants, detailed the 1% sample survey data of the 4th National Census has to be used, in which 5 categories of migrants are divided on basis of the relationship of their current residing places and *hukou* status: (1) residing in the same county or city as the *hukou* is registered; (2) residing in a county or city more than one year but the *hukou* is registered at another county or city; (3) residing in a county or city less than one year but the *hukou* is registered in another county or city; (4) residing in a county or city but where to register the *hukou* is still to be decided; (5) originally residing in a county or city but currently staying abroad for education or employment. In fact, the first category of rural-urban migrants is *hukou* rural-urban migration, which accounted for 39.05% of the total rural-urban migrants. The other 4 categories belong to non-*hukou* rural-urban migration, taking up 60.83%. Of which, the second category rural-urban migrants, residing in a county or city more than one year but the *hukou* is registered at another county or city, alone accounted for 54.85% (Table 7). Among of the total rural migrants, 35.23% and 64.0% of them respectively have non-agricultural and agricultural *hukou* status, the rest 0.77% belong to the fourth and fifth categories. Therefore, in 1985-1990, the numbers of *hukou* rural-urban migration and non-*hukou* rural-urban migration is respectively 6.53 million and 10.17 million; 5.89 million migrants had non-agricultural *hukou* while 10.7 million with agricultural *hukou*. It is understandable that the majority of rural-urban migrants belonged to non-*hukou* migration and still registered as agricultural population.

Table 7 demonstrates that *hukou* status had significant impacts on the types of rural-urban

migration. On one hand, the majority of rural-urban migrants with non-agricultural *hukou* status belonged to *hukou* migration, by 93.27%; while 90.15% rural-urban migrants with agricultural *hukou* status belonged to non-*hukou* migration. On the other hand, the majority of *hukou* migrants (80.9%) held non-agricultural *hukou* status while nearly 95% of non- *hukou* migrants had agricultural *hukou* status. Those two points justify the observation that non-*hukou* migration is dominated by rural-urban migrants with agricultural *hukou* status and the majority of current rural-urban migration in China belong to non-*hukou* migration.

Table 7. Relationship between *hukou* status and types of rural-urban migration

		Rural-urban migration %		
		Total	Non-agricultural <i>hukou</i>	Agricultural <i>hukou</i>
Composition of <i>hukou</i> and non- <i>hukou</i> migration	Total	100.00	100.00	100.00
	<i>hukou</i> migrants	39.17	93.27	9.85
	non- <i>hukou</i> migrants	60.83	6.73	90.15
Composition of non-agricultural and agricultural <i>hukou</i>	Total	100.00	35.23	64.00
	<i>hukou</i> migrants	100.00	83.90	16.10
	non- <i>hukou</i> migrants	100.00	3.90	94.84

Data Source: The 1% sample survey data of the 4th National Census; Table 6.4.6 (R. Zha, 1996, pp.71).

Typically, non-*hukou* rural-urban immigrants are primarily employment-driven, depend heavily on inform migration networks, moving from regions of high population pressure to areas with higher economic development level where large numbers of low-skilled jobs are available. The movements have mostly been self-initiated responses by farmers to market forces of demand and supply (K.W. Chan, 1999a). Constrained by the current political and social structures, they are only considered as “floating population” or “temporary population” even though some of them have already resided in the cities for years. In fact, they are the main targets of potential urbanization population in China in the future. In order to formulate the scenarios of rural-urban migration in the future, it is essential to investigate the driving forces of migration and their social-economic features.

5.3 Driving forces of rural-urban migration

The massive rural-urban migration after 1980 can be broadly attributed to the following factors: the fierce pushing forces from rural area to transform surplus rural labor unleashed by the decollectivization program in 1978; the strong pulling forces that resulted from rapid industrialization and from a continuing large income disparity between rural and urban residents as well as inland and coastal regions; and the reform and improvement of supporting institutional arrangements on migration control, food and labor market, etc.

5.3.1 Surplus rural labor and the transformation to nonagricultural sectors

In the pre-reform period, rural people were members of various “People’s communes”, which were collective economic organizations. They organized economic activities according to government planning and were generally not encouraged to engage in non-agricultural production that was assigned to the urban registered “non-agricultural population”. Rural laborers were restricted from moving to urban areas by tight controls of employment opportunities, residence registration and rationing of grain and other products. China’s agricultural sector and rural area were used to function as a reservoir for residual rural labors.

With the rapid expansion of China’s rural labor forces and the continuing decrease of cultivated land, a large portion of rural labor has become underemployed or surplus in comparison to available agricultural resources. As table 8 shows, cultivated land per rural laborer declined sharply from 0.62 ha in 1960 to 0.31 ha in 1980 and further to 0.21 ha in 1995.

Table 8. Average cultivated land per rural labor in China in 1955-1995

Year	Area of cultivated land (million ha)	Rural laborer force (million)	Area per capita (ha/person)
1955	110.16	185.92	0.59
1960	104.86	170.19	0.62
1965	103.59	233.98	0.44
1970	101.13	278.14	0.36
1975	99.71	294.59	0.34
1980	99.31	318.36	0.31
1985	96.85	370.65	0.26
1990	95.67	420.1	0.23
1995	94.97	450.42	0.21

Data source: SSB, 2000, New China's Agriculture Statistical Data for 50 years.

According to a sample survey of 11 million rural households in 2,468 townships and towns in 773 counties, SSB estimated that there were 60 million surplus rural laborers in 1982 (SSB, 1988), and some 120-150 million in the middle of the 1990s (Fan, X.Y., 1997). Zhang calculated that there were about 70 million surplus rural labor, accounting for 18% of total rural labor force in the beginning of the 1980s; about 130 million surplus rural labor, accounting for 28% of total rural labor force in the beginning of 1990s (Zhang, C.Y., 1994). Fu estimated the share of surplus rural labor was 31% in 1990s (Hu, W.L., 1999).

With the introduction of the “rural household responsibility system” and the rural decollectivization in 1978, it became essential to transform surplus rural labor from agriculture to nonagricultural sectors. Generally speaking, there were three modes for transforming surplus rural labor in China: *hukou* rural-urban migration; “leaving the land but not the villages” (*li tu bu li xiang*) or rural urbanization locally; and “leaving both the land and the villages” (*li tu you li xiang*) or non-*hukou* rural-urban migration. The second mode,

leaving the land but not the villages, dominated in the 1980s and made a very important contribution to the transformation of surplus rural labor force. However, these migrants were excluded from the statistics of 1% sample population survey data and National Census because non-agricultural rural labor usually worked at nearby TVEs within the township and county and resided in their home village. The number of rural labor force engaged in nonagricultural activities grew dramatically from 9.2 million in 1980 to 86.7 million in 1990 and further to 151.6 million in 2000 (SSB, 2001). Correspondingly, the employment structure of rural labor force has changed fundamentally. The proportion of farming, forestry, animal husbandry and fishery declined from 100% in 1978 to 79.4% in 1990 and 68.4% in 2000 and the share of nonagricultural sectors increased from 3% in 1980, to 20.6% in 1990 and 31.6% in 2000 (Figure 11).

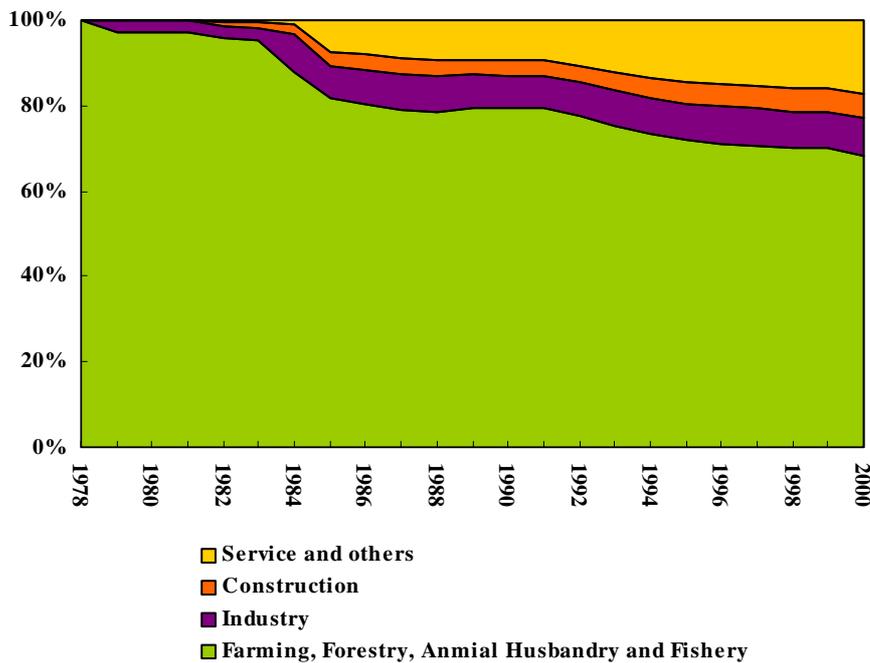


Figure 11. Employment structure change of rural labor force in 1978-2000

Data source: SSB, 2002, China Statistical Yearbook 2001.

5.3.2 Large disparities between rural-urban and inland-coastal incomes

Another important driving force of rural-urban migration is the huge rural-urban disparity and inland-coastal disparity of income and economic development level. Apart from the privileges of enjoying the various state-subsidized welfares on food supply, education, employment, medical services, etc., urban residents had a much higher income than their rural counterparts in the pre-reform era. In 1978, the Per Capita Annual Disposable Income of Urban Households was 2.6 times the Per Capita Annual Net Income of Rural Households at comparable price. As Figure 12 shows, this ratio gradually declined to the less than 1.1 in 1985, but began to rise again thereafter. It was 2.2 in 1994 and 2000. This demonstrates a continuing large income disparity between the rural and the urban households in China.

Figure 13 indicates that there is also a big regional disparity of economic development in

China in 2000. Per Capita GDP at provincial-level reduces sharply from the coastal regions to the middle and western inland regions.

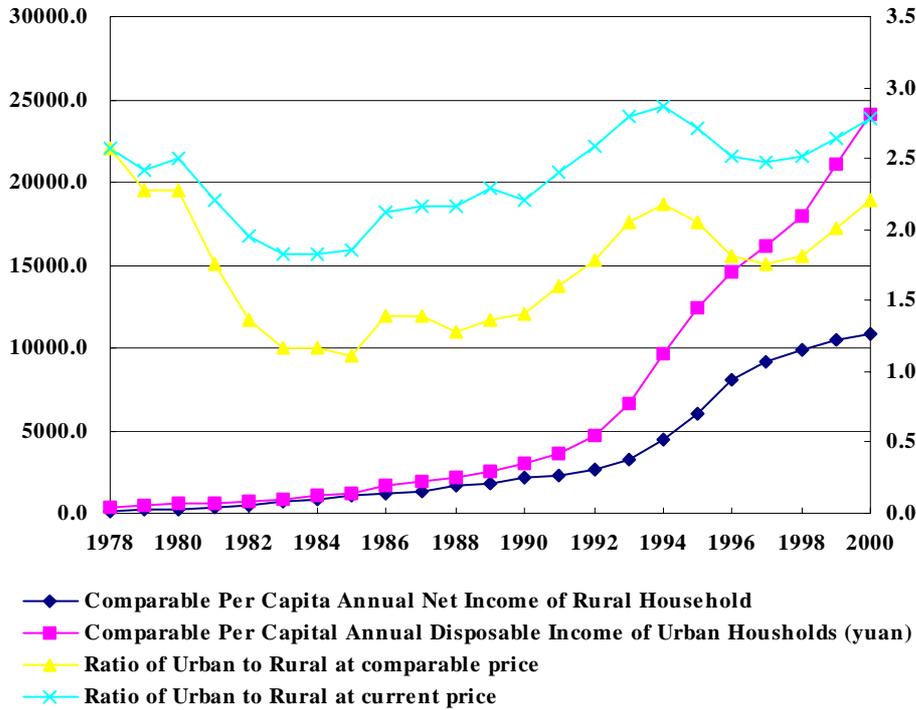


Figure 12. Rural-urban income disparity in China 1978-2000

Data source: SSB, 2002, China Statistical Yearbook 2001.

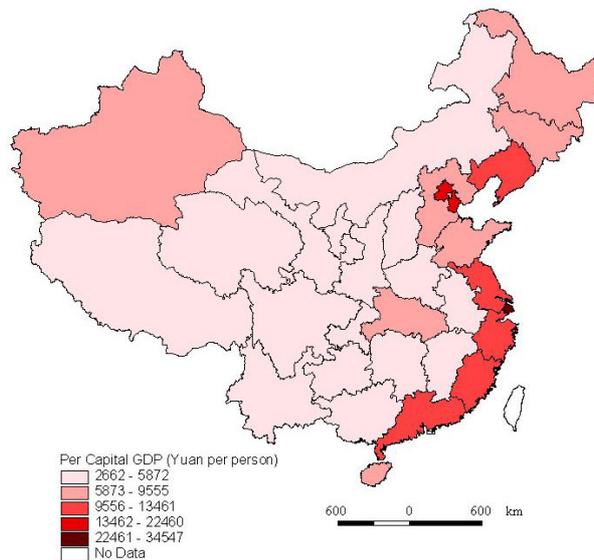


Figure 13. China's Regional Disparity in Per Capita GDP in 2000

Data source: SSB, 2002, China Statistical Yearbook 2001.

5.4 Social and economic characteristics of rural-urban migrants

The following data sources are mainly used to describe the social and economic characteristics of non-*hukou* rural-urban migrants, or floating population: SSB's sample survey on population change in 2000 (Hu, Y., 2001) and SSB's sample survey on rural labor in 1999 (Fan, X.Y., 2000).

5.4.1 Socio-demographic characteristics of rural migrants

(1) Non-*hukou* rural-urban migrants are dominated by the young and prime labor age group, particularly the age between 15 to 34. Table 9 shows a comparison of the age composition among non-*hukou* rural-urban migrants, urban residents and rural residents. In the age groups of 15-24 year olds and 25-34 year olds, the proportion of non-*hukou* rural-urban migrants is much higher than those of urban residents and rural residents, respectively by 1.6 and 1.5 times. The peak age group for non-*hukou* rural-urban migrants is in the 25-34 year olds, while that for urban residents is in the 35-49 age group, and for rural residents in class 0-14. At the age groups of more than 35, particularly more than 50, the proportions of non-*hukou* rural-urban migrants are significantly lower than those of urban residents and rural residents. In the age group of less than 14 years, the proportion of non-*hukou* rural-urban migrants is much lower than that of rural residents but slightly higher than that of urban residents. This indicates that rural-urban migrants tend to be concentrated in the most economically active age group. It suggests that a high proportion of the youngest and eldest rural people are left behind in rural areas. This characteristic is confirmed by SSB's sample survey of rural labor in 1999. Among the rural laborers migrating to the nonagricultural sector, 57.9% of them were concentrated in the age group of 18-30 (Fan, X.Y., 2000).

Table 9. Composition of non-*hukou* rural-urban migrants, urban residents and rural

Age Group	Residents by age	Unit: %	
	Non- <i>hukou</i> rural-urban migrants	Urban residents	Rural residents
0-14	19.11	17.05	26.40
15-24	18.76	12.54	14.46
25-34	30.37	19.17	18.99
35-49	20.42	26.23	20.88
50-59	5.41	10.59	8.76
60+	5.56	14.42	10.51

Data source: Fan, X.Y., 2000.

(2) Non-*hukou* rural-urban migrants are better educated than the rural residents but less educated than urban residents and there is a sharp gender disparity. Table 10 shows the composition by education level of non-*hukou* rural-urban migrants, urban residents and rural residents at age 15. For non-*hukou* rural-urban migrants, the proportion of those with junior middle school education are as high as 52.2%, followed by those with primary school

education (24.2%), those with senior middle school education (13.3%) and those illiterate (10.3%). The corresponding figures for rural residents in emigrating areas are 36.9%, 38.2% 5.7% and 19.2%; for urban residents in immigrating areas respectively 35.9%, 13.5%, 44.1% and 6.5%. These figures imply that rural-urban migrants tend to be those rural people with higher education level but that they are still less educated than their urban counterparts. Furthermore, there is a sharp gender disparity in education levels among non-*hukou* rural-urban migrants. The proportions of male migrants with junior and senior school education are respectively 55% and 16.6%, which is significantly higher than that of their female migrants' 9.3% and 0.5%. This kind gender disparity results from the traditional custom in rural areas that emphasizes the education of males but neglects that of females.

Table 10. Composition of non-*hukou* rural-urban migrants, urban residents and rural

Types	Residents by education level		Unit: %	
	Illiteracy	Primary school	Junior middle school	Senior middle school
non- <i>hukou</i> rural-urban migrants	10.3	24.2	52.2	13.3
Urban residents	6.5	13.5	35.9	44.1
Rural residents	19.2	38.2	36.9	5.7

Data source: Fan, X.Y., 2000.

5.4.2 Employment and economic characteristics

(1) Non-*hukou* rural-urban migrants are mainly employed in industry, construction, commerce and restaurant, and service sectors, According to SSB's sample survey on rural labor in 1998, among the total rural laborers transformed to the secondary and tertiary industries (about 28 million), 62.9% of them were employed by industry, construction, commerce and restaurant, and service sectors (Fan, X.Y., 1999).

(2) The majority of non-*hukou* rural-urban migrants are self-employed or employed by privately owned enterprises. According to SSB's sample survey on population change in 2000 reported by Hu (Hu, Y., 2001), 65% of rural floating population were self-employed or employed by private-owned enterprises, which was significantly higher than that for urban residents (21%). In fact, 33.4% of the rural floating population was self-employed with other employees while this figure for urban residents was only 5.5%. In contrast, the majority of urban residents (73.5%) were employed in stated-owned, urban collectively owned, joint ventures and foreign enterprises while only 12.9% of rural migrants were employed by them. This survey reveals that the majority of employment opportunities in cities are actually created by the migrants themselves.

(3) Rural migrants work much longer but get less income than urban residents. 56.9% and 37.6% of rural migrants respectively have to work more than 50 hours and 40-49 hours a week while most urban residents (78.6%) work 40-49 hours a week. Despite of their much longer working hours, rural-urban migrants get less payment than urban residents. In

1999, the average annual income of rural-urban migrating household was 9449 *yuan*, which is 18% lower than that of urban households but 33% higher than that of rural households. Figure 14 shows that the proportion of rural migrant households was higher than that of rural residents households but smaller than that of urban residents households in the higher annual income groups (> 10000 *yuan*) and lower in the lower annual income group. This has been the primary driving force of rural-urban migration.

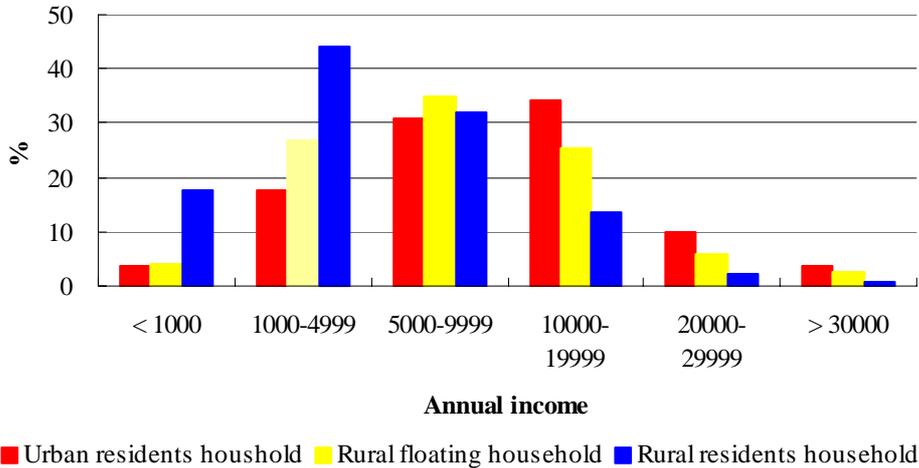


Figure 14. Composition of annual income groups of different households

Data source: Hu, Y., 2001.

5.5 Spatial pattern of rural-urban migration

5.5.1 Dominance of intra-province migration

According to the 4th National Census in 1990, a total of 34 million migrants crossing county-level units were recorded over the previous five-year period (1985-1990), about 70% or 24 million are identified to be intra-provincial migrants while the other 30% or 10 million belong to inter-province migration. The dominance of intra-province migration is confirmed by SSB’s sample survey on rural labor migration. The proportion of rural surplus labor employed within their own province to the total transformed increased from 68% in 1998 to 79% in 1999. Further, according to the 5th Census, among the total 121.07 million immigrants without *hukou* for more than 6 months, 65% or 78.65 million migrate within their own province.

5.5.2 Characteristics of inter-province migration

As Table 8 shows, the primary characteristics of inter-province migration are the net immigration to urban areas and the net emigration of rural population.

Table 8. Inter-province rural-urban migration in the 4th Census

Regions	Net migrants	Net immigrants to urban areas		Net immigrants to rural areas	
		million	%	million	%
Beijing	0.54	0.52	6.22	0.02	0.62
Tianjin	0.17	0.16	2.66	0.01	0.36
Shanxi	0.08	0.11	1.29	-0.03	-0.15
Liaoning	0.25	0.27	1.27	-0.02	-0.11
Shanghai	0.53	0.41	4.66	0.12	2.69
Jiangsu	0.17	0.38	2.64	-0.21	-0.40
Fujian	0.01	0.07	1.05	-0.06	-0.23
Shangdong	0.07	0.32	1.39	-0.25	-0.40
Hubei	0.08	0.20	1.29	-0.12	-0.31
Gongdong	1.01	1.07	4.61	-0.06	-0.15
Hainan	0.04	0.04	2.42	0.01	0.12
Qinghai	0.01	0.00	0.20	0.01	0.34
Ningxia	0.04	0.04	3.52	0.01	-0.21
Xinjiang	0.06	0.01	0.28	0.05	0.50
Hebei	-0.11	0.16	1.40	-0.28	-0.56
Inner Mongolia	-0.05	0.03	0.40	-0.08	-0.59
Jilin	-0.12	0.02	0.20	-0.14	-0.98
Heilongjiang	-0.24	-0.02	-0.11	-0.22	-1.21
Zhejiang	-0.30	0.10	0.77	-0.40	-1.39
Anhui	-0.20	0.07	0.66	-0.26	-0.57
Jiangxi	-0.07	0.02	0.30	-0.09	-0.31
Henan	-0.11	0.16	1.26	-0.28	-0.38
Hunan	-0.25	0.07	0.65	-0.33	-0.65
Guangxi	-0.45	0.01	0.24	-0.46	-1.28
Sichuan	-0.85	0.08	0.39	-0.93	-1.09
Guizhou	-0.12	0.05	0.86	-0.18	-0.67
Yunnan	-0.03	0.09	1.66	-0.12	-0.38
Shaanxi	-0.05	0.09	1.25	-0.14	-0.53
Gansu	-0.03	0.08	1.62	-0.11	-0.65

5.5.3 Spatial pattern of inter-province migration

Figure 15 depicts each provincial-level units' in and out-shares to the national total of migrants and their net migrants. Apparently, Guangdong, Shanghai, Beijing and Jiangsu, etc., were the provinces with the largest shares in terms of immigrants. Guangdong alone accommodated 1.26 million migrants from other provinces, accounting for more than one-tenth of the national total of inter-provincial migrants. In Shenzhen, one of China's four Economic Specific Zones in 1980s, the 1990 Census recorded that there was a total of 1.02 million floating population, or 1.6 times their residents (0.63 million). Sichuan was the most important sender with 1.32 million emigrants or 12% of the national total. In terms of net migration, most of the coastal, eastern provinces (such as Guangdong, Shanghai, Beijing and Jiangsu) gained from provinces like Sichuan and Guangxi in the central and western regions (K.W. Chan, 1999b).

Chan (K.W. Chan, 1999a) mapped the 30 largest inter-provincial flows of non-migrants based on the 1990 Census data and 1% sample (Figure 16). It reveals that the inter-provincial non-*hukou* migration flow (dominated by rural-urban migration as discussed in the previous section of 4.2) were primarily toward the eastern and southern coast. Guangdong, Shanghai and Beijing became the concentrated centers of rural-urban migration.

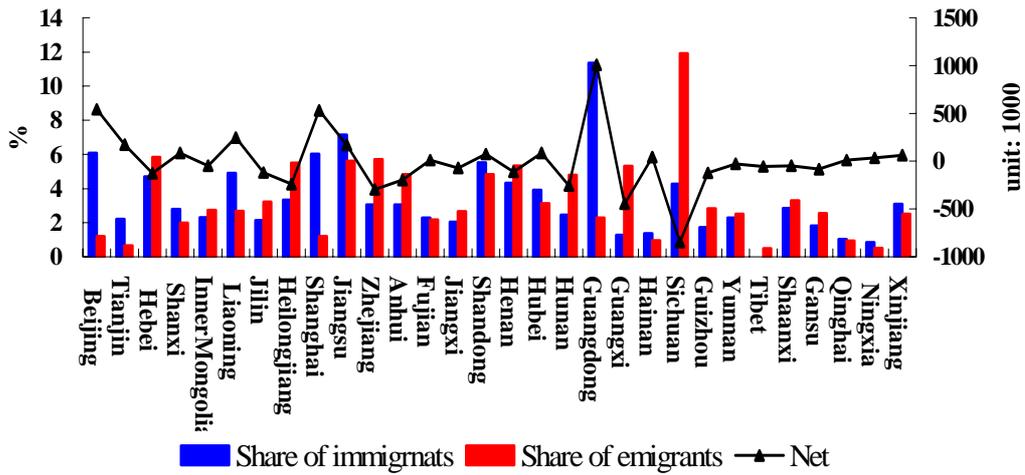


Figure 15. Provinces' net migration and their in and out-shares to the National total in 1985-1990

Data source: The Population Census Office of the State Council and SSB, 1993.

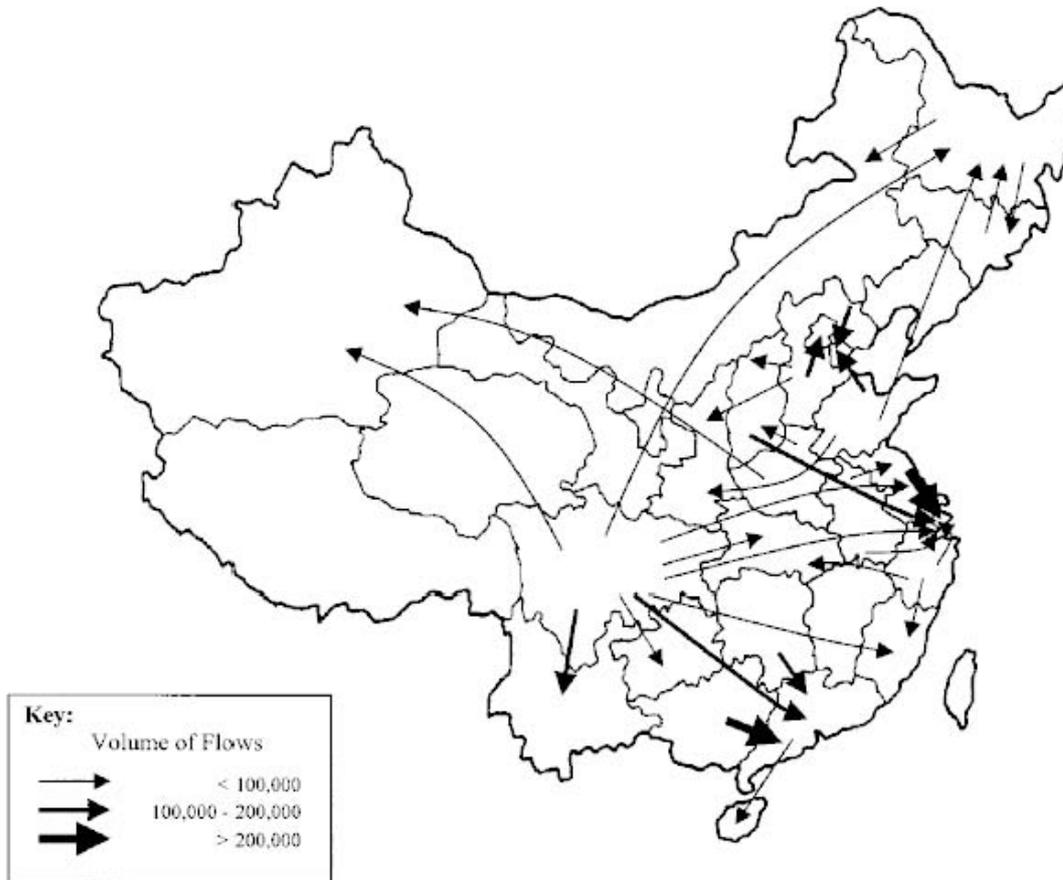


Figure 16. The 30 largest inter-provincial flows of non-*hukou* migrants in 1985-1990

Source: K.W. Chan, 1999a.

The above pattern of non-*hukou* migration is confirmed by SSB's sample survey on rural labor migration. Among those inter-provincial rural labor migrants in 1998, 82.3% of them were employed in the eastern region, only 9.4% and 8.3% were respectively transformed to the central region and the western region. Further, 62% of the inter-provincial migrants to the eastern region actually came from the central region while the majority of those to the central and western region came from other provinces in this region (X. Fan, 1998). The situation is almost the same in 1999. However, the proportions of inter-provincial rural labor migrants to the central region and the western region get increased, respectively from 9.4% to 10% and from 8.3% to 10.2% (X. Fan, 1999).

We have to use indirect approaches to estimate the inter-provincial migration in the period of 1990-2000 due to the unavailability of the detailed 2000 Census on migration (Table 11 and Figure 17). Firstly, the average annual population growth rate of each province is calculated by the geometrical average approach and the average annual migration growth rate of each province is estimated by reducing its average natural growth rate. Secondly, the size of migrants without local *hukou* for each province is estimated by reducing its total population in the 2000 Census to its total population of *hukou* registry at the end of 2000 because the former figure included those migrants who had lived at the district or township for more than a half year but their resident *hukou* were registered at other districts or townships.

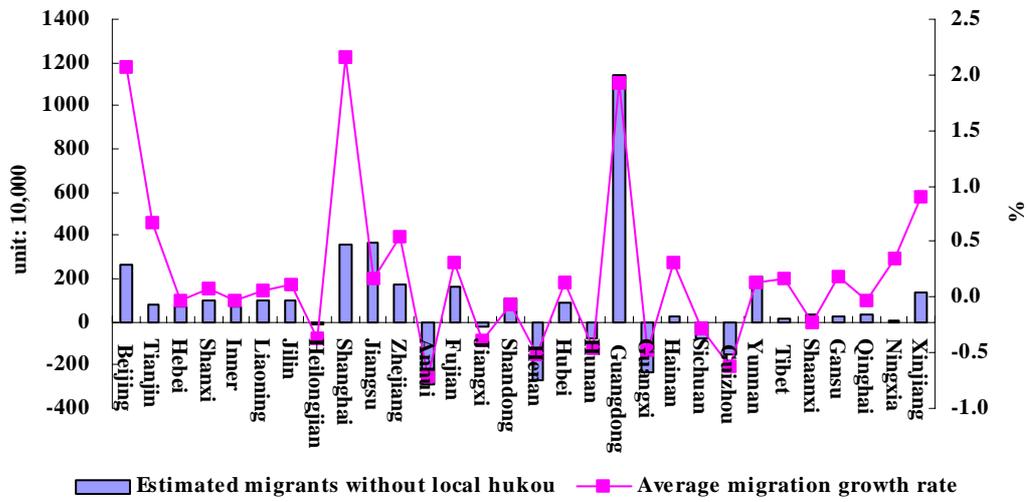


Figure 17. Estimated inter-provincial migrants and migration growth rate in 1990-2000

Data source: Table 11

Table 11. Estimated inter-provincial migrants and migration growth rate in 1990-2000 (Units: 10,000 and %)

Regions	Population in 2000	Population in 1990	Average Annual Growth Rate	Average Natural Growth Rate	Estimated Annual Migration growth Rate	Population by <i>hukou</i> in 2000	Estimated migrants without <i>hukou</i>
Beijing	1382	1082	2.48	0.41	2.07	1114	268
Tianjin	1001	879	1.31	0.64	0.67	919	82
Hebei	6744	6108	1.00	1.02	-0.02	6671	73
Shanxi	3297	2876	1.38	1.29	0.08	3196	101
Inner Mongolia	2376	2146	1.02	1.06	-0.04	2301	75
Liaoning	4238	3946	0.72	0.65	0.07	4135	103
Jilin	2728	2466	1.01	0.91	0.11	2627	101
Heilongjiang	3689	3522	0.47	0.84	-0.38	3698	-9
Shanghai	1674	1334	2.29	0.13	2.17	1322	352
Jiangsu	7438	6706	1.04	0.88	0.16	7069	369
Zhejiang	4677	4145	1.22	0.67	0.55	4501	176
Anhui	5986	5618	0.64	1.34	-0.70	6278	-292
Fujian	3471	3005	1.45	1.15	0.31	3305	166
Jiangxi	4140	3771	0.94	1.33	-0.39	4164	-24
Shandong	9079	8439	0.73	0.80	-0.07	8975	104
Henan	9256	8553	0.79	1.31	-0.51	9527	-271
Hubei	6028	5397	1.11	0.98	0.14	5936	92
Hunan	6440	6066	0.60	1.07	-0.46	6515	-75
Guangdong	8642	6283	3.24	1.32	1.92	7499	1143
Guangxi	4489	4224	0.61	1.08	-0.47	4724	-235
Hainan	787	656	1.84	1.53	0.31	761	26
Sichuan	11419	10722	0.63	0.91	-0.28	11499	-80
Guizhou	3525	3239	0.85	1.47	-0.62	3677	-152
Yunnan	4288	3697	1.49	1.37	0.13	4077	211
Tibet	262	220	1.78	1.61	0.17	251	11
Shaanxi	3605	3288	0.92	1.15	-0.23	3572	33
Gansu	2562	2237	1.37	1.18	0.18	2534	28
Qinghai	518	446	1.51	1.54	-0.02	480	38
Ningxia	562	466	1.90	1.56	0.34	554	8
Xinjiang	1925	1516	2.42	1.52	0.90	1792	133

Note:

- 1) Average annual population growth rate is calculated by the following formula:
 $k = \text{power}(\text{Pop2000}/\text{Pop1999}, 1/10) - 1$
- 2) Average natural growth rate = (natural growth rate in 1990 + natural growth rate in 1999)/2

Data sources: SSB, China Population Statistics Yearbook 2000 and 2001.

Figure 17 and Table 11 reveal that:

- Shanghai, Beijing and Guangdong are the major destination provinces of rural-urban migration. Their average annual growth rates and size of non-*hukou* migration in 1990-2000 are the highest in China, respectively Shanghai (3.52 million and 2.17%), Beijing (2.68 million and 2.07), and Guangdong (11.43 million and 1.92).
- The major source provinces of rural-urban migration are: Anhui (-0.7% and 2.92 million of net emigrants), Guizhou (-0.62% and 1.52 million of net emigrants), Henan (-0.51% and 271 million), Guangxi (-0.47 and 2.35 million), Hunan (-0.46 and 0.75 million), and Sichuan (-0.28 and 0.8 million).

In summary, the spatial pattern of inter-provincial rural-urban migration in China has been primarily from the central and western regions to the eastern coastal region and the Pearl River Delta, the Yangtze River Delta, and Beijing have become the most important centers since the 1980s, which is consistent with the regional disparity of economic development and household income. This indicates that non-*hukou* rural -urban migration in China in the reform era is primarily economic-motivated or market-driven. The main objective for rural laborers to cross hundreds or even thousands kilometers to cities in other provinces is to seek employment opportunities and benefit from large wage differentials.

6. Projections of China's Urbanization Level

6.1 Projections of China's urbanization at the national level

The former sections have demonstrated that China's urbanization trajectory after 1980 is quite rapid and consistent and this trend is anticipated to continue in the next decades. Thus, it is reasonable to simulate and project the progress of China's urbanization over the next 30 years based on its historical trajectory in the past two decades. As various kinds of definitions on urban population and urbanization level had been used in different periods of time in China, the urbanization levels in 1990 Census definition in the period of 1983-1999 were selected as the primary data source. Based on the existed researches and literature, two different simulation models are adopted: the linear regression model, and the S-curve regression model. Eventually, all projection figures have to be transformed into urbanization levels in the 2000 Census definition from those in 1990 Census definition.

6.1.1 The Linear Regression Model

Its formula is: $U_t = a_0 + a_1 * t$

Where, t is the independent variable of year, U_t is the dependent variable of urbanization level in year t .

Based on the urbanization levels in 1990 Census definition in the period of 1983-1999, the constants in this formula are estimated and the linear regression simulation equation is:

$$U_t = -1026.54 + 0.529 * t$$

The statistic features of this equation are as the following: $R^2=0.98$, $F= 714.46$, $\text{Sig.F}=0.000$, which indicates that this simulation model is statistically significant.

Calculated by this equation, China's urbanization levels in 1990 Census definition are

respectively 31.85% in 2000, 37.14% in 2010, 42.43% in 2020, and 47.72% in 2030. As the urbanization level was 36.22% in 2000 according to the 5th Census, the multiplier for transforming the urbanization levels in 1990 Census definition to that in the 2000 Census definition is 1.1373. Therefore, the projection of China's urbanization levels in the 2000 Census definition by the linear regression model are 42.24% in 2010, 48.25% in 2020, and 54.27% in 2030, (Table 12).

Table 12. Projection of China's urbanization level by the linear regression model

Year	Urbanization level in 1990 definition	Urbanization level in 2000 definition
2000	31.85%	36.22%
2010	37.14%	42.24%
2020	42.43%	48.25%
2030	47.72%	54.27%

6.1.2 The S-curve Regression Model

Its formula is (W. Xie and W. Deng, 1996):

$$U_t = \frac{1}{1 + C * e^{-r*(t-1982)}}$$

Where, t is the independent variable of year, U_t is the dependent variable of urbanization level in year t.

This formula can be transformed into a growth simulation equation:

$$Y = e^{(b_0 + b_1(t-1982))}$$

Where, $Y = 1/U_t - 1$, $C = e^{b_0}$, $r = -b_1$

Based on the urbanization levels in 1990 Census definition in the period of 1983-1999, the constants in this formula are estimated and the simulation formula of the S-curve regression model is:

$$U_t = \frac{1}{1 + 3.4885e^{-0.0272*(t-1982)}}$$

The statistic features of this equation are the following: $R^2=0.97$, $F= 507.08$, $\text{Sig.F}=0.000$, which indicates that this simulation model is statistically significant.

Calculated by this formula, China's urbanization levels in the 1990 Census definition were 31.86% in 2000, 38.02% in 2010, 44.6% in 2020 and 51.37% in 2030. As the urbanization level was 36.22% in 2000 according to the 5th Census, the multiplier for transforming the urbanization levels in the 1990 Census definition to that in the 2000 Census definition is 1.137. However, it would be unsuitable to directly transform the predicted figures by this multiplier as China's urbanization levels in the future, because this simulation function is nonlinear. Therefore, we have to first transform the data series of China's urbanization levels in 1983-1999 in the 1990 Census definition to that in the 2000 Census definition by this multiplier and then construct another S-curve simulation model to project China's urbanization levels in the next 30 years.

Based on the transformed data series of China's urbanization levels in the 2000 Census definition in the period 1983-1999, another S-curve regression model is constructed:

$$U_t = \frac{1}{1 + 2.95094e^{-0.02862*(t-1982)}}$$

The statistic features of this equation are as follows: $R^2=0.98$, $F= 666.57$, $\text{Sig.F}=0.000$, which indicates that this simulation model is statistically significant. Based on this model, the urbanization level was 43.03% in 2010, 50.14% in 2020 and 57.24% in 2030.

6.2 Projections of China's urbanization and at the provincial level

In the existing literature in China and abroad, there are very few studies focusing on projections of China's urbanization at the provincial level, mainly because of the serious lack of suitable data. In Chinese official statistics, there are no data on urban population at provincial level except for the last three national Censuses where different definitions on urban population were used. The only available time-series data at the provincial level concerned with urban population in China is the non-agricultural population in cities and towns, based on the 1963 census definition or the pre-1982 definition. They are widely used to compare and analyze regional disparity of urbanization and urban development in China, but unfortunately they do not qualify to be used directly to simulate urbanization progressions at the provincial level in the future, because this definition is based on the out-dated *hukou* system which is bound to be abolished in the future, and is inconsistent with the national Census definitions for excluding the rural-urban migrants.

Therefore, a sound way to predicting China's urbanization level at provincial or regional level is to find approaches to transform the data series in pre-1982 definition (the ratio of the non-agricultural population in cities and towns to the total population) to that in the 5th Census definition. The only approach existing in the literature is to follow the same procedure as in the national case: firstly dividing a specific province's urbanization level in pre-1982 definition in 2000 according to Ministry of Security's Household Registration by that in the 5th Census definition, and then use it as a multiplier to transform its historical data series of non-agricultural population, and finally using the new-transformed data series to project the province's future urbanization level (Projection group,1997) by using the S-curve regression

model. (As for those simulation models at the national level, the S-curve regression model appears to be the only suitable one at the regional level because the linear regression simulation do not fit in the historical trajectories of those highly-urbanized regions, such as Beijing, Shanghai and Tianjin, and it would be too difficult to project per capita GDP data in the next 30 years at the provincial level essentially required by the Logarithmic-curve regression model with GDP per capita.).

However, the directly-transformed approach is problematic because it does not treat inter-provincial migrants properly and needs be improved. As urban population in the 2000 Census in some provinces included a significant part of inter-province immigrants, of which about 80% are accounted for as urban population, the directly-transformed multiplier would be an over-estimated in those provinces with positive net inter-province immigrants but small urbanization level in non-agricultural population definition, and be under-estimated in those provinces with negative net inter-province immigrants. Therefore, we develop another indirect approach to transform the historical data series of urbanization levels in pre-1982 definition to that in the 2000 Census definition for each province, which is named as the modified transformation approach.

Based on the newly-transformed data series of urbanization levels in the 2000 Census definition in 1980-2000 in each province by using the direct and modified transformation approaches respectively, the S-curve regression model is employed to project China's urbanization progress at province level in the next 30 years.

6.2.1 *The directly-transformed approach*

The directly-transformed approach takes the following steps to project the urbanization levels in the 2000 Census definition in the next 30 years for each province in China: Firstly, to estimate each province's multiplier ($\eta_{i,2000}$) by dividing its urbanization in the 2000 Census definition to that in pre-1982 definition in 2000; Secondly, to transform the historical data series of urbanization level in pre-1982 definition in 1980-2000 to a new data series in the 2000 Census definition by the multiplier; Thirdly, to estimate the parameters of the S-curve

regression model ($U_t = \frac{1}{1 + C * e^{-r*(t-1979)}}$) for each province and to project its urbanization

level in the 2000 Census definition in the next 30 years. Table 14 presents the estimated multiplier for data transformation, parameters of the S-curve regression model and the projected urbanization levels in the 2000 Census definition in 2010, 2020 and 2030 for the 29 provinces¹ in China.

¹ Hainan is included into Guangdong and Chongqing into Sichuan

Table 14. Projections of China’s urbanization level at provincial level by the directly-transformed approach

Regions	$\eta_{i,2000}$	parameters of the S-curve regression model			projected urbanization level (%)		
		C	r	R ²	2010	2020	2030
Beijing	1.1346	0.6297	0.0365	0.98	83.13	87.65	91.09
Tianjin	1.2526	0.5501	0.0161	0.97	74.97	77.87	80.52
Hebei	1.3985	6.9834	0.044	0.97	35.93	46.55	57.5
Shanxi	1.3427	4.226	0.0418	0.92	46.38	56.79	66.63
Inner Mongolia	1.2737	2.4343	0.0278	0.97	49.27	56.17	62.85
Liaoning	1.1948	1.5309	0.0315	0.94	63.4	70.35	76.47
Jilin	1.1561	1.9628	0.0354	0.96	60.44	68.53	75.63
Heilongjiang	1.1987	1.6424	0.0296	0.94	60.37	67.18	73.35
Shanghai	1.1909	0.5729	0.0617	0.93	92.19	95.63	97.59
Jiangsu	1.3254	5.855	0.0606	0.98	52.81	67.24	79.01
Zhejiang	2.2196	3.4435	0.0547	0.96	61.3	73.25	82.56
Anhui	1.4834	6.149	0.0466	0.98	39.07	50.48	61.89
Fujian	2.072	3.2225	0.0403	0.98	51.97	61.82	70.78
Jiangxi	1.3322	5.6433	0.0376	0.99	36.25	45.3	54.68
Shandong	1.5475	8.1358	0.0831	0.98	61.76	78.76	89.49
Henan	1.3744	9.2214	0.0509	0.99	34.46	46.66	59.28
Hubei	1.495	4.1212	0.0546	0.94	56.88	69.49	79.73
Hunan	1.5544	6.0867	0.046	0.99	40.62	52.01	63.2
Guangdong	1.7669	3.8032	0.081	0.96	76.39	87.91	94.23
Guangxi	1.7291	6.5562	0.0492	0.94	41.19	53.39	65.19
Sichuan	1.5326	6.6111	0.0468	0.99	39.23	50.76	62.21
Guizhou	1.7174	5.8135	0.03	0.94	30.38	37.08	44.31
Yunnan	1.6855	6.6606	0.0332	0.97	29.61	36.97	44.98
Tibet	1.9021	5.1824	0.0081	0.39	19.87	21.19	22.58
Shaanxi	1.4587	4.5303	0.0368	0.96	40.84	49.93	59.02
Gansu	1.3282	5.6272	0.0295	0.92	30.75	37.37	44.5
Qinghai	1.4648	2.7038	0.0243	0.58	43.98	50.03	56.07
Ningxia	1.2064	4.6455	0.0428	0.96	44.81	55.48	65.66
Xinjiang	1.0917	2.9819	0.0225	0.88	40.24	45.74	51.36

The statistical features show that the S-curve regression models are all significant at 0.05% level except for Tibet.

6.2.2 Modified transformation approach

As the definition of non-agricultural population in cities and towns is essentially *hukou*-based, in order to use this kind of data and to take inter-province immigrants into account, we divide the urban population in each province in 5th Census definition into two parts: (1) urban population with *hukou* ($UPH_{i,t}$), which is supposed to have much stronger linear relationship with non-agricultural population in cities and towns, and hence can be transformed by the multiplier of this proportion in 2000; (2) urban immigrants without *hukou* (residing in cities or towns for more than 6 months) ($UINH_{i,t}$).

Then, the following formula is adopted to transform the historical data series of urbanization levels in the pre-1982 definition in 1980-2000 to that in the 2000 Census definition for each province. Similar to the third step of the directly-transformed approach, the S-curve

regression model ($U_t = \frac{1}{1 + C * e^{-r*(t-1979)}}$) is employed to project China's urbanization

progress at province level in the next 30 years by using the newly-transformed data series of urbanization levels in the 2000 Census definition.

$$U_{i,t} = \frac{UPH_{i,t} + UINH_{i,t}}{TP_{i,t} + TI_{i,t}} = \frac{UPH_{i,t} + \alpha_{i,t} * TP_{i,t}}{TP_{i,t} + \beta_{i,t} * TP_{i,t}} = \frac{UPH_{i,t}}{TP_{i,t} * (1 + \beta_{i,t})} + \frac{\alpha_{i,t}}{(1 + \beta_{i,t})}$$

$$= \frac{\eta_{i,2000} * NAUP_{i,t}}{TP_{i,t} * (1 + \beta_{i,t})} + \frac{\alpha_{i,t}}{(1 + \beta_{i,t})} = NAU_{i,t} * \frac{\eta_{i,2000}}{(1 + \beta_{i,t})} + \frac{\alpha_{i,t}}{(1 + \beta_{i,t})}$$

While,

$$\alpha_{i,t} = \frac{UINH_{i,t}}{TP_{i,t}}$$

$$\beta_{i,t} = \frac{TI_{i,t}}{TP_{i,t}}$$

$$\eta_{i,2000} = \frac{UPH_{i,2000}}{NAUP_{i,2000}} = \frac{UP_{i,2000} - UINH_{i,2000}}{NAUP_{i,2000}} = \frac{UP_{i,2000} - \alpha_{i,2000} * TI_{i,2000}}{NAUP_{i,2000}}$$

$i \in (1,30)$, represents the specific province in China (the Hainan province is merged into the

Guangdong province, Chongqing into Sichuan),

$t \in (1980,1999)$

$U_{i,t}$: the urbanization level of the i province at year t

$NAU_{i,t}$: the predicted urbanization level in non-agricultural population definition of the i

province at year t

$UPH_{i,t}$: urban population with *hukou*

$UINH_{i,t}$: net inter-province urban immigrants without *hukou* (more than 6 months)

$TP_{i,t}$: the total population in Household Registration

$TI_{i,t}$: The net total inter-province migrants without *hukou* (more than 6 months)

$NAUP_{i,t}$: the non-agricultural population in cities and towns

$UP_{i,2000}$: the urban population in the 5th Census in 2000 in the i province

Based on the discussions in Section 5, the following features of non-*hukou* inter-province migration have been observed: (1) non-*hukou* migration is dominated by rural-urban migrants with agricultural *hukou* status and the majority of current rural-urban migration in China belongs to non-*hukou* migration; (2) the primary characteristics of inter-province migration are the net in-migration to urban areas and the net out-migration of rural population.

We assume:

(1) 80% of the net inter-provincial non-*hukou* migrants come from the rural areas of the source provinces and move into cities and towns in the destination provinces; while, 20% of the net inter-provincial non-*hukou* migrants come from cities and towns of the source provinces and move into the rural areas in the destination provinces. Then,

(a) for the provinces with positive net inter-provincial non-*hukou* migrants, the net inter-province urban in-migrants without *hukou* ($UINH_{i,t}$) is 80% of their net total inter-province migrants without *hukou* ($TI_{i,t}$).

$$\alpha_{i,t} = \frac{UINH_{i,t}}{TP_{i,t}} = \frac{80\% * TI_{i,t}}{TP_{i,t}} = 0.8 * \beta_{i,t}$$

$$\eta_{i,2000} = \frac{UPH_{i,2000}}{NAUP_{i,2000}} = \frac{UP_{i,2000} - 0.8 * TI_{i,2000}}{NAUP_{i,2000}}$$

(b) for the provinces with negative net non-*hukou* inter-province migrants, the net inter-province urban in-migrants without *hukou* ($UINH_{i,t}$) is 20% of their net total inter-province migrants without *hukou* ($TI_{i,t}$).

$$\alpha_{i,t} = \frac{UINH_{i,t}}{TP_{i,t}} = \frac{20\% * TI_{i,t}}{TP_{i,t}} = 0.2 * \beta_{i,t} \quad (\beta_{i,t} \text{ is negative})$$

$$\eta_{i,2000} = \frac{UPH_{i,2000}}{NAUP_{i,2000}} = \frac{UP_{i,2000} - 0.2 * TI_{i,2000}}{NAUP_{i,2000}}$$

(2) The non-*hukou* inter-province migration rates for all provinces in China are zero for 1980 ($\beta_{i,1980} = 0$), and those in 1980-1990 and 1990-2000 could be estimated by the linear regression model.

Table 15. Estimated urbanization level in the 2000 Census definition in 1980- 2000 at provincial level by the modified-transformed approach

Regions	Estimated size of migrants without <i>hukou</i> million		$\beta_{i,1990}$ %	$\beta_{i,2000}$ %	$\eta_{i,2000}$	Estimated urbanization level in the 2000 Census definition (%)		
	1990	2000				1980	1990	2000
Beijing	0.46	2.68	4.46	24.06	1.1269	61.94	68.10	77.59
Tianjin	0.08	0.82	0.92	8.92	1.2413	64.10	68.27	72.05
Hebei	-0.09	0.73	-0.14	1.09	1.3670	12.41	18.05	26.08
Shanxi	0.31	1.01	1.08	3.16	1.2878	17.52	27.68	34.91
Inner Mongolia	-0.04	0.75	-0.17	3.26	1.2374	28.55	35.49	42.68
Liaoning	0.29	1.03	0.73	2.49	1.1797	38.54	48.20	54.24
Jilin	0.26	1.01	1.06	3.84	1.1286	32.47	42.94	49.66
Heilongjiang	0.33	-0.09	0.94	-0.24	1.1967	37.09	47.30	51.53
Shanghai	0.51	3.52	3.96	26.63	1.2567	70.18	77.16	88.31
Jiangsu	0.34	3.69	0.51	5.22	1.2611	15.23	23.73	41.49
Zhejiang	-0.91	1.76	-2.16	3.91	2.1643	21.55	34.08	48.68
Anhui	-0.43	-2.92	-0.75	-4.65	1.4642	13.53	19.11	27.81
Fujian	0.05	1.66	0.17	5.02	1.9762	23.55	30.06	41.58
Jiangxi	0.10	-0.24	0.26	-0.58	1.3471	15.53	21.25	28.03
Shandong	0.16	1.04	0.19	1.16	1.5276	11.41	23.97	38.00
Henan	-0.11	-2.71	-0.13	-2.84	1.3546	10.37	15.35	22.95
Hubei	0.24	0.92	0.44	1.55	1.4718	19.23	30.67	40.21
Hunan	-0.45	-0.75	-0.73	-1.15	1.5485	14.63	21.04	29.75
Guangdong	0.41	11.69	0.60	14.15	1.6450	20.86	37.39	53.76
Guangxi	-0.17	-2.35	-0.40	-4.97	1.7048	14.07	19.13	28.16
Sichuan	-0.92	-0.80	-0.85	-0.70	1.5293	14.05	19.44	28.43
Guizhou	0.02	-1.52	0.07	-4.13	1.7053	15.84	18.53	23.86
Yunnan	0.03	2.11	0.07	5.18	1.4747	12.08	15.90	23.37
Tibet	0.02	0.11	0.69	4.38	1.6480	16.01	14.81	19.07
Shaanxi	0.13	0.33	0.40	0.92	1.4387	17.73	24.78	32.26
Gansu	0.07	0.28	0.32	1.10	1.2939	14.43	19.86	24.01
Qinghai	0.11	0.38	2.51	7.92	1.3123	22.28	32.28	34.73
Ningxia	0.00	0.08	-0.03	1.44	1.1785	17.34	26.07	32.36
Xinjiang	0.17	1.33	1.13	7.42	0.9813	21.64	27.89	33.83

Note: It is assumed that the sizes of inter-provincial migrants without *hukou* in 1980 in all provinces are zero.

Table 16. Projections of China's urbanization level at provincial level by the modified-transformed approach

Regions	Parameters of the S-curve regression model			Projected urbanization level (%)		
	C	r	R ²	2010	2020	2030
Beijing	0.6728	0.0380	0.99	82.82	87.58	91.15
Tianjin	0.5687	0.0177	0.99	75.27	78.42	81.26
Hebei	7.2321	0.0454	0.97	36.07	47.04	58.30
Shanxi	4.4582	0.0444	0.93	47.01	58.03	68.30
Inner Mongolia	2.5714	0.0299	0.98	49.58	57.01	64.15
Liaoning	1.5668	0.0324	0.94	63.53	70.66	76.90
Jilin	2.0435	0.0371	0.96	60.73	69.15	76.46
Heilongjiang	1.6424	0.0296	0.93	60.37	67.18	73.35
Shanghai	0.5131	0.0598	0.95	92.56	95.77	97.63
Jiangsu	6.3075	0.0647	0.99	54.05	69.19	81.08
Zhejiang	3.5884	0.0559	0.96	61.17	73.37	82.81
Anhui	7.5634	0.0534	0.97	40.93	54.18	66.87
Fujian	3.4979	0.0436	0.98	52.52	63.12	72.59
Jiangxi	5.5438	0.0376	0.99	36.66	45.74	55.11
Shandong	8.2657	0.0838	0.98	61.89	78.96	89.66
Henan	9.3829	0.0509	0.99	34.08	46.25	58.87
Hubei	4.2056	0.0555	0.95	57.04	69.81	80.10
Hunan	6.1250	0.0463	0.99	40.66	52.11	63.34
Guangdong	4.2795	0.0852	0.97	76.62	88.48	94.74
Guangxi	6.7038	0.0500	0.95	41.26	53.66	65.62
Sichuan	6.6388	0.0470	0.99	39.26	50.84	62.33
Guizhou	5.8665	0.0303	0.94	30.36	37.11	44.41
Yunnan	8.0117	0.0415	0.98	31.09	40.58	50.83
Tibet	6.3595	0.0172	0.70	21.14	24.16	27.45
Shaanxi	4.6046	0.0376	0.95	41.08	50.39	59.67
Gansu	5.8227	0.0311	0.93	31.04	38.04	45.59
Qinghai	3.1884	0.0311	0.74	45.14	52.90	60.52
Ningxia	4.8210	0.0441	0.97	44.87	55.85	66.28
Xinjiang	3.5360	0.0296	0.96	41.45	48.76	56.13

Table 15 presents the estimated urbanization level in the 2000 Census definition in 1980-2000 at provincial level by the modified-transformed approach. Table 16 shows the projected urbanization levels at the provincial level in China over the next 30 years, based on the estimated urbanization level in the 2000 Census definition in 1980-2000 at provincial level by the modified-transformed approach. Comparing Table 14 with Table 16, we can find that, in almost every province, the regression gives higher R² and is statistically more significant based on the modified-transformed approach compared to the directly-transformed approach.

7. Prospects and Scenarios of China's Urbanization and Rural-urban Migration

7.1 Prospect of China's urbanization and rural-urban migration

The predictive regression models, discussed in the last section, would certainly provide insights on the long-term urbanization trends in China. However, care should be taken to interpret their projection results because they are purely “statistical” models and the predicted period is as long as 30 years while its observed period is less than 20 years. In fact, the speed at which urbanization will proceed in the next 30 years depends on the long-term urbanization trend, economic development, supporting system reform and policies and so on, while those statistical models do not take into the effects of potential system and policy reforms. Therefore, in order to formulate rational scenarios of China's urbanization and rural-urban migration in the next 30 years, it is essential to conduct a comprehensive analysis and assessment on the impacts of future social and economic development, institutional reforms and policy options on urbanization.

Considering its remarkable improvement on productivity and easier accession to the international food market, China's agriculture can support the accelerating urbanization process and relieve its constrain on urbanization. Grain shortages and inadequate supply of agricultural and sideline products have long been a vexation for China and also one of the long-standing main impediments for its urban development and rural urban migration. However, with the implementation of household responsibility system since 1978, China's agricultural productivity and the output of grain and other agricultural products have been significantly promoted, which have not only satisfied the needs of newly-increased urban population, but also facilitated and supported the transformation of rural laborers to non-agricultural activities at large scale. However, Due to its huge population, the transformation of farmland to urban use still need to strictly controlled in China in the long run.

Due to the existing large amount of surplus rural labor force and huge rural-urban disparity in income and living standards, the potential pushing forces of urbanization and rural-urban migration in China would remain strong for a rather long period. As in most developing economics, rural-urban migration in China in peaceful times is primarily employment or economic-driven. The sizes and directions of rural-urban migration are basically determined by the demand of urban economic development (pulling forces) and institutional reforms on *hukou*, land tenure and social welfare and security systems.

Will cities and towns in China generate sufficient jobs to absorb rural surplus labor in the next 10 or 30 years? There are several opportunities and challenges. First of all, China is expected to become a “world factory” with rapid growth of manufacturing enterprises in global production network, due to its cheaper labor cost, easier access to regional markets and increasing foreign direct investment (FDI) after China's accession to WTO (C. Gu, 1999; D. Webster, 2002). The manufacturing enterprises usually are labor-intensive and require large amount of workers with a relative low education level and skills which new rural-urban migrants can fit in. Secondly, the tertiary industry in cities and towns has great development potentials. Currently, the tertiary industry in Chinese cities and towns is rather backward and

less developed. With increasing income and living standards, the demand on services will rise strongly. Thirdly, urbanization as a process creates economic growth. It has been observed everywhere that per capita income is higher in cities than in rural areas. The reason is simply that productivity is higher in cities. This is true not only of labor productivity, but also of capital productivity, and even for infrastructure productivity. By moving labor and capital from lower to higher productivity areas, it automatically increases average productivity (P. H. Remy, 2000). Challenges include: sharp decrease of the ability of TVEs to absorb rural labor since the later half of the 1990s, serious unemployment problems of their own in cities in the process of economic restructuring and the state-owned enterprise reform, fragile urban infrastructure to sustain and accommodate large-scale rural-urban migration.

A series of market-oriented institutional reforms has been or is expected to be launched in China to actively promote the urbanization process because the Chinese government has realized the serious adverse consequences on urbanization and economic growth resulting from the former urban-rural segmented institutional regulations and therefore defined active promotion of the urbanization process as one of the 5 strategic priorities of China's economic development during the 10th Five Year Plan period. It includes: (1) Reform of the *hukou* system, which will gradually relax the restrictions on farmers' residences in cities and eventually establish a free rural-urban migration system. (2) Reform of the employment system. China's urban and rural labor market are still separated up to now, which means that rural laborers are still subjected to various discriminative constraints and restrictions. To increase the efficiency of resources allocation and production requires removal of the barriers of labor and firm mobility and a regional and urban-rural integration labor market. (3) Reform of the rural land tenure and transfer system and improvement of the social security system in urban and rural area. Generally speaking, land is state-owned in cities and towns and collective-owned in rural area. Each farmer is usually allocated by contract the land use rights on a certain amount of collective-owned land in the village or enjoys the share of benefits from leasing or selling collective-owned land by population average. However, the farmer will automatically lose his rights on collective-owned land after he migrates and resides in cities and towns. His land use rights on his former collective-owned land are not transferable and cannot be sold by law. To make things worse, the employment in cities and towns is not stable and the social security system is still backward, particularly in small cities and towns. Thus, plenty of farmers, especially those in suburban or rapid development areas, do not want to become urban residents at the cost of losing their land use rights on collective-owned rural land. The rural land tenure system has to be reformed to increase its mobility and the social security system need to be improved to provide basic life security for both urban and rural residents. (4) Proper adjustments on administrative areas, to promote consolidation between cities and counties and between cities and cities and to relieve the restrictive impacts of a city or town's administrative division to its development.

7.2 Scenarios of China's urbanization level

Plenty of Institutes and scholars at home and abroad have also made various projections on China's urbanization over the next 20-30 years and the majority of these projections are based on the 4th definition of urban population in 1990.

- (1) In the report of "Planning and Prospect of the Establishment of the Designated Cities

in China” published in 1997, the Ministry of Civil Affairs (MCA) and Institute of Geography, Chinese Academy of Sciences, estimated that China’s urbanization level would be 34.54% in 2000, and 42%-45% in 2010 when the “Temporary Population” residing in cities for rather long time are taken into account (Project group, 1997).

(2) When preparing for “The Specialized Planning on Urbanization in “the 10th Five-year” at the end of the 1990s, an important component of the “China’s Social and Economic Development Planning in “the 10th Five-year”, the State Development Planning Commission (SDPC) considered that China could possibly achieve the goal of increasing its urbanization level nearly 1 percent per year in the next 15 years (35% in 2005 and 45% in 2015 compared to 30.4% in 1998), on the condition that innovative systems and policy reforms must be implemented (Y. Wang, 2001, p.83-84). Otherwise, the growth rate of China’s urbanization level is unlike to be more than 0.8 percent per year, similar to that in the “6th Five-year”.

(3) Also during preparing for “The Specialized Planning on Urbanization in “the 10th Five-year”, the Ministry of Construction (MOC) projected that China’s urbanization would reach up to 43% in 2010 and 52% in 2020 (Y. Wang, 2001, p.66-69).

(4) Assuming that China’s urbanization level (U_t) is the logarithmic function of its per capita GNP in US dollar ($PGNP_t$) in the same year ($U_t = -51.44 + 13.82 * \ln(PGNP_t)$, $R^2 = 0.78$), and that China’s annual growth rate of GDP and population in 2000-2020 would be respectively 7.2% and 0.8%, Li Shantong for the Development Research Center estimated that China’s urbanization level would be 50.3% in 2010, 58.81% in 2020, and 67.32% in 2030. Based on that, Li further claimed that it would be a proper goal to upgrade China’s urbanization level from 31% in 2000 to 60% in 2020 or at the growth rate of nearly 1.5 percent per year on average (S. Li, 2001). However, it should be noticed that the estimated urbanization level in 2000 is 41.8% according to his formula and the difference to the actual figure is quite big or 39%.

(5) UN predicts that China’s urbanization level would be 45.2% in 2010, 53.4% in 2020, and 59.5% in 2030 (UN, 2002).

(6) Based on an accounts-based urban-rural population model for China in which the components of rural to urban population migration are driven by a demographic-economic model, their own estimated urban population data for the period of 1983-87, and different assumption on the total fertility of the urban and rural population, Shen and Spence (J. Shen and N. Spence, 1996) made 3 scenarios on China’s urbanization.

(7) Based on the historical time-series of 1980-1997, Guan Ke, etc., estimated that Chinese urbanization rate might reach 50% in 2010, respectively by using the exponential function, gray system GM (1,1) and growing curve model. (K.Guan and X. Li, 2000).

(8) Zhou considered that it is an impossible goal to raise China’s urbanization level to 50% in 2020 or 60% in 2030 because the required numbers on new employment and investment, etc., would be astronomically high and have no means of being realized, and the proper goal is to upgrade China’s urbanization level to 50% in 2050 (T. Zhou, 2000).

(9) Based on his qualitative analysis on the development stages of China’s urbanization, Liu thinks that China has to take about 35 years to raise its urbanization level to 50% or in 2035 (X. Liu, 2000).

Table 17. Various projections of China’s urbanization level in the next 30 years

	MCA	SDPC	MOC	UN2001	Li S.	Shen A	Shen B	Shen C	Guan K.	Liu X.	Zhou T.
2000	34.54	31.7	32.5	32.1	31	40.44	40.52	40.52			
2010	45	40	43	45.2	50.30	49.21	49.52	49.52		50% in 2035	50% in 2050
2020	-	50	52	53.4	58.81	57.22	58.08	57.89	50		
2030	-	-	-	59.5	67.32	63.69	65.1	64.54			

Note: All Urbanization levels are on the definition of the 4th Census in 1990.

Table 18. Various projections of the average annual growth of China’s urbanization level in the next 30 years

	MCA	SDPC	MOC	UN2001	Li S.	Shen A	Shen B	Shen C	Guan K.	Liu X.	Zhou T.
2001-2010	1.05	0.83	1.05	1.31	1.87	0.88	0.90	0.90			
2011-2020	-	1.0	0.9	0.82	0.88	0.80	0.86	0.84	0.69	0.39	0.23
2021-2030	-	-	-	0.61	0.85	0.65	0.70	0.67			

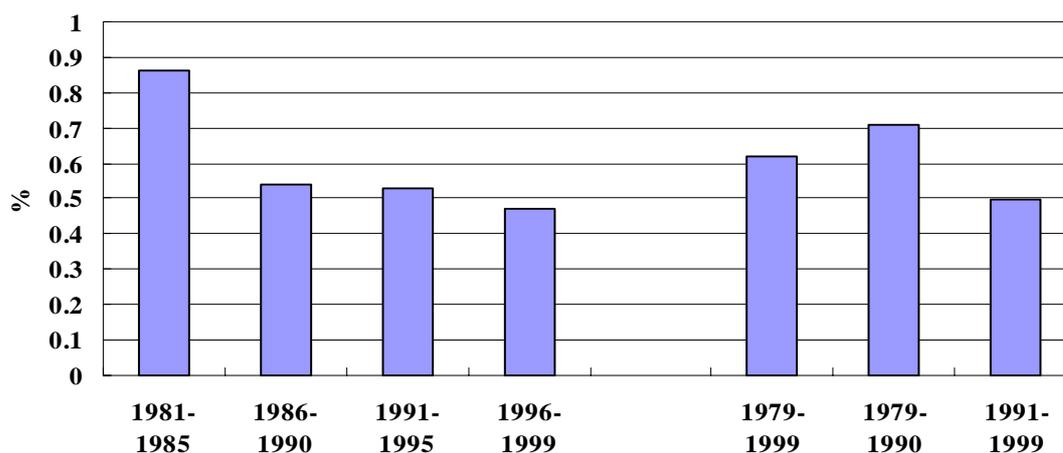


Fig. 10. The average annual growth rate of urbanization level in China in various periods in 1979-1999

Taking the average annual growth rate of urbanization level in China in various periods between 1979-1999 as a reference, those projections on China’s urbanization growth in the next 20-30 years can be summarized into three categories: (1) Highly rapid growth, with an annual growth rate of more than 0.8 or 1 percent on average. The growth of urbanization level will accelerate, even faster than that in 1981-1985, the most rapid period in the past 20 years. (2) Moderately fast growth, with an annual growth rate between 0.6 and 0.8, faster than the average but less than that in the most rapid period in the past 20 years. (3) Slow growth, with an annual growth rate of less than 0.6, the average in the past 20 years, due to the increasing resource and environmental constraints.

Obviously, our projections fit into the moderately fast growth and the slow growth types while

none in the highly rapid growth type. Because our 3 kinds of projection models are all constructed on the historical trajectory over the past 20 years without taking the effects of the potential system and policy reforms in the future into account. In fact, urbanization is driven by the pushing force from rural labor transformation and the pulling force of urban economic development while policy options and institutional reforms will affect the functions of both the pushing force and the pulling force. The State Development and Planning Commission (SDPC) has pointed out that: if only taking the economic development trends into account, the annual growth rate of urbanization level is unlike to be more than 0.8 percent; but if innovative system and policy reforms have been implemented, it is possible to raise the urbanization level by 1.0 percent per year (Y. Wang, 2001, p.83).

Anyway, the prospects of institutional reforms used to be of highly uncertain because they might result in a re-allocation of benefits and welfare among various interest groups and have significant deep political and economic impacts. Based on different assumptions on the prospects of China's market-oriented institutional reforms, 3 scenarios of China's urbanization level over the next 30 years are proposed (Table 15):

(1) **High Scenario (H)**: Assuming that China's market-oriented institutional reforms would achieve complete success and would significantly facilitate the development of urbanization, its annual growth rate would be more than 0.8 or 1 percent (Highly rapid growth). We take SDPC's projection as the reference of the high scenario: the annual growth rate of urbanization level would be 0.85 percent in 2001-2010, 1.0 percent in 2011-2020, and 0.9 percent in 2021-2030. Therefore, China's urbanization level according to the 5th Census definition will be 44.7% in 2010, 54.7% in 2020, and 63.72% in 2030.

(2) **Medium Scenario (M)**: Assuming that China's market-oriented institutional reforms would achieve partial success and China's urbanization trend would follow the common S-curve trajectory, experienced in most countries in the World, in which the speed of urbanization growth would accelerate when its urbanization level increases from 30% to 70%. We take our projection based on the S-curve Regression Model as the reference of the medium scenario: China's average annual growth of urbanization level is respectively 0.68% in 2001-2010, 0.71% in 2011-2020 and 2021-2030, and China's urbanization level is 43.03% in 2010, 50.14% in 2020, and 57.24% in 2030.

(3) **Low Scenario (L)**: Assuming that China's market-oriented institutional reforms do not achieve significant progress and China's urbanization would still be constrained by institutional systems as over the past 20 years. China's urbanization trend would proceed as "business as usual", fitting in the linear regression model. China's urbanization level would rise at an average annual rate of 0.6 percent, as over the past 20 years. Then, China's urbanization level would be 42.24% in 2010, 48.25% in 2020, and 54.27% in 2030.

7.3. Scenarios of China rural-urban migration

It is essential to project China's total population in the future in order to estimate its urban population growth and rural-urban migration with different scenarios of urbanization level.

Many international and Chinese institutes and scholars have made various projections on the growth of China's total population, such as United Nations, State Family Planning Commission (*SFPC*); China's Research Center for Population Information (CRCPI), etc., and the differences among these results are basically modest. This paper adapts the project made by CRCPI: the total population of China would be 13.77 hundred million in 2010, 14.72 hundred million in 2020, and 15.25 hundred million in 2030. The average natural growth rate would be 0.8% in 2001-2010, 0.68% in 2011-2020, and 0.37% in 2021-2030.

Then, the total urban population and its growth rate can be estimated (Table 15 and Table 16) as follows:

In the High Scenario, the total urban population in China will be 616 million in 2010, 805 million in 2020, and 972 million in 2030; the average annual growth of the urban population would be 15.7 million in 2001-2010, 19 million in 2011-2020, and 16.6 million in 2021-2030.

In Scenario Two, the total urban population in China would be 607 million in 2010, 789 million in 2020, and 992 million in 2030; the average annual growth of urban population would be 14.9 million or by 2.84% in 2001-2010, 18.2 million or by 2.63% in 2011-2020, and 20.3 million or by 2.33% in 2021-2030.

In Scenario Three, the total urban population in China would be 583 million in 2010, 712 million in 2020, and 831 million in 2030; the average annual growth of urban population would be 12.4 million or by 2.42% in 2001-2010, 13 million or by 2.03% in 2011-2020, and 11.9 million or by 1.55% in 2021-2030.

Table 19. Urban and rural population at different scenarios 2000-2030 million

Year	Total pop million	H		M		L	
		UP million	UR %	UP million	UR %	UP million	UR %
2000	1266	458.55	36.22	458.55	36.22	458.55	36.22
2010	1377	615.79	44.72	592.52	43.03	581.64	42.24
2020	1472	805.48	54.72	738.06	50.14	710.24	48.25
2030	1525	971.73	63.72	872.91	57.24	827.62	54.27

Table 20. Growth of urban population and urbanization level in 2000-2030

Period	Annual growth of urban population (million)			Annual growth rate of urbanization level %		
	H	M	L	H	M	L
2000-2010	15.72	13.40	12.31	0.85	0.68	0.60
2011-2020	18.97	14.55	12.86	1.0	0.71	0.60
2021-2030	16.63	13.48	11.74	0.9	0.71	0.60

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