

Cai, Jiming; Du, Guonan; Liu, Yuan

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Measurement of the real urbanization level in China and its international comparison

Jiming Cai, Du Guonan and Liu Yuan
Tsinghua University, Beijing, China

Real
urbanization
level in China

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Abstract

Purpose – The purpose of this paper is to estimate the real urbanization level in China so as to provide a measurement that can be compared with the international level.

Design/methodology/approach – Taking into consideration 300m residents living in the administrative towns (300m residents here are referred to the population in administrative towns, including those in all counties), the gap between the urbanization rate of China and that of the world average becomes much wider.

Findings – China, however, implements the administrative system of government at the central, provincial, municipal, county and township levels. By city, it means the jurisdiction at and above the level of county, which includes the municipality directly under the central government, prefecture-level municipal and county. By town, it means the jurisdiction below the level of county (including the Chengguan Town, or capital town, where the county government is located) and exclusive of rural townships.

Originality/value – China has witnessed rapid development for 40 years since the reform and opening up in 1978. Nowadays, China has already stepped into the period of post-industrialization, with its urbanization rate (UR) of permanent population reaching 58.58 percent. However, on the basis of registered population, the UR is 43.37 percent, which is not only far below the average level of 81.3 percent in high-income countries, but also lower than the average of 65.8 percent in upper middle-income countries which are comparable to China in terms of per capita income. (The classification of state income level is based on the data of national income per capita and division standards in 2016 from the World Bank, in which annual revenue per capita in high-income countries reaches over US\$12,736 and that in upper middle-income countries between US\$4,126 and US\$12,735.)

Keywords Urbanization, International comparison, Townization

Paper type Research paper

1. The connections and differences between urbanization and townization

It could have been noted by some careful readers that the term “urbanization” mentioned in this paper is different from “townization,” which has been used in official documents or some scholars’ academic publications. Therefore, it begs several questions as to what is the distinction between urbanization and townization? Whether these two terms can be used alternatively or is one of them more scientific so that it can replace the other?

1.1 The definition of the concepts of city and town

We shall first make clear-cut definitions of and distinctions between the concepts of city and town.

According to the administrative organization system in western democracies which implements the policy of regional autonomy, both the government of cities and that of towns



are established through the election by their local residents. For this reason, the difference between cities and towns only lies in their sizes rather than superior-subordinate relations.

China, however, implements the administrative system of government at the central, provincial, municipal, county and township levels. By city, it means the jurisdiction at and above the level of county, which includes the municipality directly under the central government, prefecture-level municipal and county. By town, it means the jurisdiction below the level of county (including the Chengguan Town, or capital town, where the county government is located) and exclusive of rural townships.

The city is also different from the town with respect to the level of economic and social development. In accordance with the "Provision on the Statistical Division of Urban and Rural Areas" (formally approved by the State Council on July 12, 2008 National Decree, 2008, No. 60), the urban districts of the established cities approved by the State Council include the downtown areas of municipals with subordinate districts and those without subordinate districts.

Urban areas of municipals with subordinate districts include (1) the entire jurisdiction under district government, with the population density of municipal districts at and above 1500 people per square kilometer; (2) the seat of district government and the areas for other sub-district offices, with the population density of municipal districts below 1500 people per square kilometer; and (3) the entire jurisdiction of relevant administrative towns and rural townships, if the urban construction of district government mentioned in (2) has extended to part of the areas of the surrounding administrative towns and rural townships. Other areas of municipals with subordinate districts are divided in accordance with this provision's standard for townships and rural towns.

Urban areas of municipals without subordinate districts include the seat of municipal government and the areas for other sub-district offices, and the entire jurisdiction of relevant administrative towns and rural townships, if the urban construction of the seat of municipal government has extended to part of the areas of the surrounding administrative towns and rural townships. Other areas of municipals without subordinate districts are divided in accordance with this provision's standard for towns and villages.

In accordance with "Report on Adjustment of Establishing Standards of Towns," which was ratified by the State Council and transmitted to the Ministry of Civil Affairs in 1984, the difference between towns and rural townships is as follows: towns should be set where local governments at county level are located; towns can be established if there are more than 2,000 non-agricultural population in the rural townships and at the seats of their governments, and with a total population of less than 20,000; towns can be established if the proportion of non-agricultural population is above 10 percent in the rural townships and at the seats of their governments, and with a total population of more than 20,000; and towns can also be established if actually necessary for areas of minorities, remote areas with sparse population, mountainous areas, mining areas of small scale, tourist spots and frontier ports, even though the non-agricultural population of these areas is less than 2,000.

It can be demonstrated that there are qualitative and quantitative distinctions between cities and towns (especially cities and administrative towns except county seats) from the perspectives of both administrative levels of governments and economic and social development. By the end of 2017, China has in total 661 cities and 21,116 administrative towns above county level. The number of permanent residents reaches 156m at Chengguan towns (where county governments are located), with a population of approximately 100,000 per county on average. The number of permanent residents at other administrative towns is approximately 187m, with only 10,300 people per town on average[1]. However, population sizes and economic power of some administrative towns in east China have far surpassed that of some counties or even prefecture-level cities in the central and west China. For instance, the number of permanent residents in Humen Town and Chang'an Town of

Dongguan (in Guangdong Province) has reached 0.6m in 2017, and the regional economic gross of both towns exceeded RMB 50bn. Besides, the population of permanent residents in Yiwu, a county-level city, has reached 1.37m in 2017, among which the number of permanent residents in downtown areas has reached 0.88m, which has far surpassed that of its prefecture-level city, Jinhua (0.8m). It indicates that the pace of the adjustment of China's administrative system severely lags behind local economic and social development.

China's "Urban Planning Law" explicitly states that "cities in this Law refer to the municipality directly under central government, municipals and towns set on the basis of administrative construction systems," which obviously includes administrative towns in the category of cities. However, cities and towns are differentiated from each other when cities of diverse sizes and small towns are mentioned together in official contexts. Therefore, it seems that the definitions of cities and townships in both broad and narrow sense can be given as below:

- (1) Cities in broad sense include towns while that in narrow sense exclude towns.
- (2) Towns in broad sense contain cities and towns while that in narrow sense exclude cities in narrow sense.
- (3) Small towns in broad sense include small cities and towns in narrow sense, whereas small towns in narrow sense mean the small ones compared with large and medium towns. Small towns in official contexts particularly indicate all townships of difference sizes.

1.2 Differences between urbanization and townization

To take urbanization or townization as the dominant strategy of national economic development remains an essential issue due to the prominent distinctions between cities and towns, even though only one character differs in Chinese.

First of all, from the respect of differences between "cities" and "towns" in the corresponding two concepts, "urbanization" and "townization," the administrative level of cities is superior to that of towns. Also, generally speaking, economic and social development as well as modernization degree of cities is higher than those of towns.

Second, the Chinese character "hua" shared in the two concepts of "urbanization" and "townization" has the fundamental meaning of change and alteration[2]. According to explanation of modern Chinese, the Chinese character "hua" is an affix for word formation, which can be used after nouns or adjectives to form verbs, gerunds or adjectives, and presents the changes into certain properties or status.

Last but not the least, urbanization means citizenization of agriculturally transferred population from an overall perspective, which not only stresses the transformation from agricultural labor force to non-agricultural industries, but also emphasizes the conversion from rural inhabitants to urban residents. However, townization means the changes of many rural residents into town residents, admitting or even emphasizing the necessity and rationality of sayings such as "farmers leaving lands but not villages" "entering factories but not cities" or "entering cities without registered household," "immigrating but not settling down," etc., which is a sort of incomplete (or undone) urbanization.

1.3 Urbanization or townization, which is more scientific and rational?

First, townization embodies changes of large quantity of rural inhabitants into town residents, among which many town residents have not completely detached from agricultural production. It usually results in the establishment of considerable small towns, which occupies too many cultivated lands, wastes large quantity of resources, damages the eco-system and pollutes the environment, missing the ideal effects of urbanization.

Urban areas are the places with the development of non-agricultural industries, urban lives, the well-beings pursued by population transferred from agriculture; urban civilization, the direction of development of rural civilization; and citizens; the ultimate identities of rural residents.

Besides, the wording of “coordinated development of large, medium, small cities and small towns” in the 16th National Congress of CPC contains contradictions: cities of diverse sizes include both cities and towns at different scales if the interpretations of cities and towns in broad sense are employed, therefore the following phrase “small towns” are redundant; if cities and towns are interpreted in narrow sense, towns apart from cities include medium and large towns instead of the small ones only. Administrative towns can be regarded as micro-cities if the concept of cities in broad sense is adopted and townization is replaced by urbanization. In this case, the statement in the 16th National Congress of CPC can be altered to “the coordinated development of large, medium, small and micro cities,” which eliminates the previous contradictions. Even if cities and towns are interpreted in broad sense, urbanization includes both cities and towns; alternatively, townization includes both towns and cities. So far for the condition of China, strategy of “urbanization” is more scientific and rational than that of townization, because to take urbanization as the strategic option emphasizes the prior development of big cities with no exclusion of the development of medium or small cities and administrative towns. The only difference lies in the fact that the identity change of migrant workers into town residents is at the preliminary stage of urbanization in broad sense, which calls for larger population migrated and integrated in large and medium cities. Particular towns such as Chengguan towns, central towns and key towns can be developed into small or medium cities. In terms of the final realization of urbanization, it is sure that more and more people will gather in large cities, and more and more towns will develop into cities. If the concept of townization is employed, the identities of agriculturally transferred population should alter into both citizens and town residents. Also, there will be an increasing demand for changes of large and small towns, which will inevitably result in the over-establishment of small towns with large agriculturally transferred population remained, as well as the considerable degradation of the quality of urbanization[3].

In addition, urban agglomeration or metropolitan regions instead of town agglomeration or town groups are mentioned in discussion on ways and layouts of urbanization or townization regardless of official contexts or academic fields; farmers and citizens instead of farmers and towners are parallel in discussion on relations between urban and rural residents; citizenization instead of townnerization of migrant workers and rural residents is stressed in discussion on the essence of new human-oriented townization.

Lastly, since “urban” involves the meanings of both city and town[4], towns in many countries have smaller population, some of which even lack the administrative systems of towns. “Urbanization” merely indicates the transfer and integration of population to city. China has set up administrative towns, many of which possess relatively similar population with that of small cities in foreign countries. The population in China hence transfers to not only cities, but towns as well, which can be regarded as one of the features of townization with Chinese characteristics. In order to show such differences from foreign countries, “urbanization” is thus named as “townization” in China (Gu, 1991; Jian *et al.*, 2010). Such view needs further discussion. On one hand, though the interpretation of the word “urban” contains the scopes of both city and town in *Oxford Advanced Learner’s English-Chinese Dictionary*, many other authoritative dictionaries merely explain the word as “of city,” “urban life” and “urban area[5].” It seems that different interpretations in different English dictionaries cannot be regarded as the basis of interpreting “urbanization” in China as “townization[6].” On the other hand, “urbanization” is interpreted as the process of changes into cities in foreign countries, whereas it is explained as townization in China. There is no

necessity to interpret the same concept into different words if the two shares the same meaning; or, it is not comparable under Chinese and foreign cultures and even causes misunderstanding and confusion for foreign scholars if urbanization and townization are distinct concepts.

2. The basic status of urbanization in China

2.1 *The level and rate of urbanization is relatively low*

In 1978, the 3rd Plenary Session of the 11th Central Committee of the Communist Party of China set the guideline of focusing on economic modernization. Since then, China has witnessed rapid development of economy and urbanization. Based on official statistics, from 1982 to 2018, the proportion of China's permanent urban population increased from 21.13 to 59.58 percent, with a growth of 38.45 percentage points. At the end of 2018, China's permanent urban population reached 831.37m, which is 3.88 times larger than that of the early stage of reform and opening up.

However, the level of urbanization in China is still relatively low. According to the 2018 statistics published by the United Nations Department of Economic and Social Affairs, in 2017, the average UR was 54.8 percent for the whole world, 81.3 percent for high-income countries and 52 percent for middle-income countries[7]. At present, China's UR in terms of permanent population is higher than the world average, but lower than that of the USA (82.1 percent), Germany (77.3 percent), Japan (91.5 percent), Russia (74.3 percent), Brazil (86.3 percent) and South Africa (65.9 percent)[8].

From 1949 to 2018, China's UR increased by an average of only 0.7 percentage points every year, which is undoubtedly a very low figure. Among them, from 1949 to 1978, China's UR only increased from 10.64 to 17.92 percent with an average annual growth of 0.25 percentage points in 30 years. Even if examining the UR in the 36 years from 1982[9] to 2018 when China witnessed both rapid economic growth and improvement of urbanization level, the annual increase is only 1.07 percentage points[10], which is still lower than the UR of Japan, South Korea, Taiwan and other countries and regions at similar historical periods of time. From 1940 to 1970 after the Second World War, the UR in Japan increased from 37.7 to 72.1 percent, with an average annual increase of 1.15 percentage points in 30 years[11]. The high-speed economic development of South Korea began in the 1960s. From 1970 to 1985, the UR of South Korea increased from 41.2 to 65.4 percent. That is to say, the urbanization level of South Korea increased by 24.2 percentage points in 15 years, with an average annual increase of 1.61 percentage points[12]. During the period of economic take-off, the urbanization level in Taiwan increased from 50.2 percent in 1960 to 78.3 percent in 1985, increasing by 28.1 percentage points in 25 years, with an average annual increase of 1.12 percentage points[13].

As shown in the above statistics, it is found that compared with developed countries and regions such as Japan, South Korea, and Taiwan, the level of urbanization in China is not high but low, and the speed of urbanization is not fast but slow.

2.2 *The UR of registered population is lower than that of residential population*

Registered urban population refers to the urban residents with "non-agricultural registered residence," as opposed to the rural population with "agricultural registered residence." This dual system of household registration is a unique system of population management in China, which aims to control the transfer of rural population to cities and the resulted growth of urban population.

Residential population is a specific concept in statistics and it is used as a statistic index in the international census of urban population. It refers to the total number of people who actually live in a certain area for a certain period of time. The US Census Bureau defines urban populations as "residents living in urban areas." The population registration system of the

USA allows citizens to move and migrate freely, but the living conditions of citizens in the place where they move and migrate must meet the requirements of the city's laws on health and so on. For example, they must have certain housing sizes and stable income sources. After the reform and opening up, with the adjustment of the administration system of “withdrawal of rural townships and setting of towns” and “withdrawal of counties and setting of cities (districts)[14],” as well as the separation of residents from households, the statistic method of urban population began to change from measuring the registered to the residential since 1982 so as to accurately and timely reflect the changes in the total number and structure of urban population in China. The third census conducted in 1982 defined urban population as the residential population (including both non-agricultural and agricultural population) living in the jurisdiction of cities and towns, whereas the rest of the population were rural population. The residential population is defined as those with a residing time of six months and above, which means “the population living in urban or rural areas for more than six months (or the population living in the areas for less than six months, but leaving household registration areas for more than six months) are recorded as residential population.” After that, the basic definition of urban residential population has not changed.

The dual system of household registration for urban and rural areas in China caused a huge difference between the URs, respectively, based on the statistics of urban registered population and residential population. As shown in Figure 1, from 1982 to 2018, the UR of residential population increased from 21.13 to 59.58 percent, with a growth of 37.45 percentage points. However, the UR of registered population only increased from 17.6 to 43.37 percent, with a growth of 25.77 percentage points only.

Although the URs measured, respectively, by the standards of registered population and residential population show the similar variation trend, there are differences in terms of absolute changes. The UR calculated by the proportion of residential population was significantly higher than that of registered population, with a difference of 16.21 percent in 2018. This means that 226m rural migrant workers and their families without household registration in cities and towns were falsely “urbanized.” Although they were regarded as urban population, they did not actually enjoy the welfare in health care, employment, education, social security and housing as urban registered population because of the existence of the dual system of household registration.

The “dual system of household registration” makes the rural migrant population unable to enjoy the same social welfare as the urban population, which brings serious social and economic problems. According to the statistics, there are 36m migrant children, 61m left-behind children, 50m left-behind women, 50m left-behind elders[15] and the spring festival

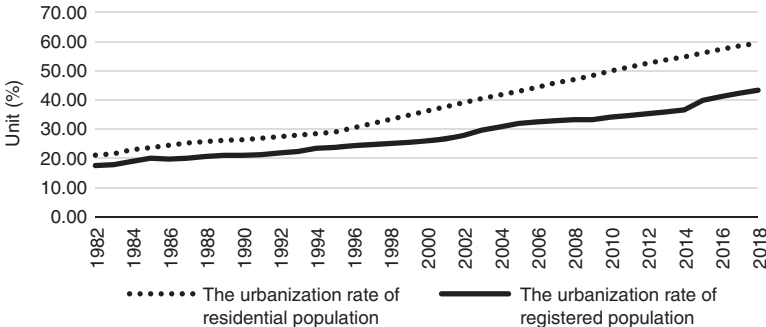


Figure 1.
Urbanization rates
calculated by the
proportion of
residential and
registered population

Source: State Statistical Bureau: *China Statistical Yearbook, China Statistical Yearbook on its Population and Employment*

travel rush of around 3bn trips that has plagued the government for years. These problems to some extent are due to the fact that these semi-urbanized people cannot adapt themselves to the environment in cities.

2.3 The rate of urbanization is lower than the rate of townization

Moreover, due to the one-sided promotion of policies of developing small towns and encouraging farmers to stay close to their hometowns, the urban residential population also includes more than 300m residents living in counties and other administrative towns. It is undoubted that the UR in terms of population living in cities will be much lower than that in terms of population living in both cities and towns.

In 2017, there were 661 cities and 21,116 towns in China. The urban population is different on the basis of different statistic methods, with the UR calculated by the population living in cities far lower than the townization rate calculated by the population living in both cities and towns. The UR calculates the proportion of urban residential population living in 661 cities to the nation-wide population, whereas the townization rate calculates the proportion of urban residential population living in 661 cities together with 340m urban residents living in 20,000 towns nationwide. Deducting 340m urban residents from the total urban population, the UR will be only 34 percent, and excluding the urban population living in non-capital towns, the UR will only reach 45 percent. Consider that more than 200m migrant workers and their families are still in the state of “semi-urbanization” despite being included in the residential urban population, China’s real UR will be further lowered.

That is to say, urban population in a broad sense is significantly larger than that in a narrow sense. Specifically, the quality of urban population in a broad sense, due to the lower level of economic and social development in counties and towns than that in cities, is generally below the quality of urban population in a narrow sense. Therefore, regarding urbanization in a broad sense, the dominant strategy of China’s economic and social development of urbanization will overestimate the level of urbanization of China against the global situation.

3. The measure of real UR in China[16]

Both the statistic method of measuring UR based on the residential population and that based on the registered population cannot accurately reflect the real level of urbanization: on one hand, although some of the transferring agricultural population live and work in cities and are included in the urban residential population, the dual system of household registration caused their household registration remains in the countryside. Therefore, if urban population is limited to the registered population living in urban areas, the urbanization level will to some extent be underestimated. On the other hand, although rural migrant workers and their family members live and work in cities for a long time, they cannot enjoy the same welfare as urban registered population. For this reason, the townization rate calculated by urban residential population overestimates the urbanization level in our country, hence inaccurate measurement and inflated UR.

Therefore, the statistical measurement of China’s urban population can neither take the registered population approach nor the residential approach in general. These two approaches can only measure some but miss other factors and they go to extremes; thus, they cannot accurately measure the number of urban population. This section intends to find a balanced statistical approach regarding the above two approaches, so as to accurately measure the real level of urbanization in China.

3.1 The definition of real urban population

Urban population is neither a population which is artificially designated nor it is a permanent concept. It is a group of people who really enjoy urban welfare with the change of

resource allocation. The agglomeration effect of cities leads to continuous population gathering. The essence of urbanization is to share the benefits of urban infrastructure and public services. Therefore, the existence of urban population is inseparable from urban public facilities and services. Urban population is a dynamic concept, which varies constantly with the flow of population.

The definition of urban population depends on the characteristics that distinguish city from countryside. Cities enjoy agglomeration effect. This is because the sharing of high-quality infrastructure and high-level public services in cities brings about the improvement of production efficiency and living standards. Therefore, the analysis of differences between urban and rural population should also be made from this perspective, that is, urban population should be defined and measured based on the quality of life and welfare level. According to Kirkby (1985), “as long as a group of people have a living standard and way of life which is equal to that of residents in cities and towns, they should be included in the urban population.” This understanding of urban population not only reflects its practical significance, but also makes our country’s statistic method of urban population compatible with the international standard.

In 2012, the State Council’s government work report pointed out that “the direction of China’s future urbanization is to promote the citizenization of rural migrant workers and gradually extend basic urban public services to cover rural migrant workers.” Thus, the distinction between urban and rural population is characterized by urban public services. This paper argues that a group of people, as long as they enjoy urban public infrastructure and services, should be included into the urban population in a certain proportion.

To sum up, this paper defines urban population as “the entire population working in non-agricultural industries and fully enjoying urban public infrastructure and public services, and their families.” Because it is based on reality and reflects the actual difference between urban and rural population, the present paper names the urban population under this definition as “real urban population.”

3.2 The formula for calculating the real urban population

According to the definition of real urban population given in the present paper, urban population should be composed of two groups, as shown in Figure 2. The real urban population includes the registered urban population and the non-registered residential

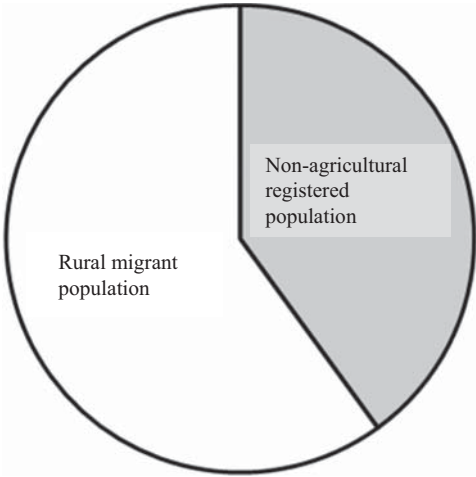


Figure 2.
The composition of
real urban population

population who lives in cities but enjoys a lower level of urban public facilities and services than registered urban population. The part of non-registered residential population refers to the population who lives in the city for a long time but with agricultural household registration. The latter is calculated with a specific ratio.

The first group of real urban population is those with urban household registration, or non-agricultural household registration. This part of population has been living in the city for a long time and has enjoyed the relevant public facilities and services in the city.

The second part of real urban population is the rural migrant workers who lived in the city. They move from rural areas to cities in order to improve their quality of life and income. However, due to the fact that public services in China are often tied up to the nature of household registration, the agricultural population does not fully enjoy relevant urban welfare. They can get access to the city's spacious roads, developed public transport, beautiful green squares and advanced cultural environment, but cannot fully enjoy the city's social security, housing security and children's education due to the restrictions of household registration[17]. This group of people cannot be totally included into the real urban population but should be converted into urban population based on the extent to which they enjoy urban public services. This paper calls this calculation method as the conversion method according to the degree of citizenization of rural migrant workers.

The measurement of real UR should be based on the real urban population in the city, that is, the registered population with full citizenship (with coefficient of urbanization degree being 1) plus the non-registered migrant residential population which are converted based on their degree of citizenization and then divided by the city's whole population (including all local registered population and non-registered migrant residential population). The calculation equation is as follows:

$$\begin{aligned}
 \text{real urbanization rate} &= \frac{\text{real urban population}}{\text{total population}} \\
 &= \frac{\text{non - agricultural registered population} + \alpha \times \text{rural migrant population}}{\text{total population}} \\
 &= \frac{\text{non - agricultural registered population} + \alpha \times (\text{residential urban population} - \text{non - agricultural registered population})}{\text{total population}} \\
 &= \frac{\text{non - agricultural registered population}}{\text{total population}} + \frac{\alpha \times \text{residential urban population}}{\text{total population}} \\
 &= \frac{\alpha \times \text{non - agricultural registered population}}{\text{total population}} \\
 &= (1 - \alpha) \times \frac{\text{non - agricultural registered population}}{\text{total population}} + \alpha \times \frac{\text{residential urban population}}{\text{total population}} \\
 &= (1 - \alpha) \times \text{urbanization rate of urban registered population} \\
 &\quad + \alpha \times \text{urbanization rate of residential urban population.} \tag{1}
 \end{aligned}$$

The key to calculating the real urban population is to determine the accurate coefficient of non-registered urban migrant population calculated as the urban population, that is, the value of "citizenization degree."

We set α as the coefficient of citizenization degree, which is determined by the level or degree of urban public facilities and public services enjoyed by residents:

$$\alpha = \frac{1}{2}(\alpha_F + \alpha_S). \tag{2}$$

In this equation, α_F refers to the coefficient of the citizenization degree of public facilities and α_S the coefficient of the citizenization degree in accessing public services. Assuming that the

weights of the two coefficients are equal, we can obtain the coefficient α of citizenization degree by calculating the arithmetic mean value of the two coefficients.

3.2.1 *Public facilities*. Public facilities include various kinds of equipment provided by the government so as to serve the urban production and residents' living[18].

Public facilities include the following types[19]:

- (1) municipal infrastructures including bridges, roads, drainage facilities, lighting facilities and so on;
- (2) public utilities including urban water, power and gas supply, telecommunications, public transport and so on;
- (3) landscaping facilities including urban public green space, specified green space, production green space such as parks, scenic areas and so on;
- (4) environmental sanitation facilities including public toilets, garbage cleaning, rain and snow cleaning facilities; and
- (5) other public facilities including fire control facilities, traffic signs, etc.

The degree of perfection of public facilities represents the degree of modernization of an area. The sustainable growth of the number and types of public facilities not only promotes the economic benefits of city but also greatly optimizes the living environment of city. The increase of public facilities makes urban life more comfortable and convenient. However, public facilities in rural areas lagged largely behind those in urban areas. For example, sanitary toilets and tap water are not fully popularized, public transportation is still hard, and living environment is poor. The huge gap in quality of life between urban and rural areas drives more and more rural people to move to and live in cities.

Both registered and non-registered residential population in cities can get same access to and share the public facilities. Rural population in cities can also enjoy city's broad roads, appreciate flowers in the green land and take public transportation, which is no different from the urban registered population. Therefore, we set α_F , the degree of citizenization of public facilities enjoyed by rural migrant population in cities, as 1.

3.2.2 *Public service*. Public service refers to various kinds of services provided by the government to meet people's basic living requirements.

The standard of coverage of public service is mainly based on the household registration, so the fundamental difference between citizens and farmers lies in different degrees that they can enjoy public service.

There are two different ways of understanding public service. In the broad sense, public service refers to various types of facilities and services provided by the government to meet people's living need. For example, Li Yihua (2008) defined public service as basic public goods and services related to the livelihood of people which includes both physical public facilities and abstract public services such as health, education and so on. In the narrow sense, public service should be limited to the category of service, which only consists of social security, housing and compulsory education and so on. Wang Qian (2008) argued that urban public services are provided "to meet the basic social needs of citizens, and should not be divided by household registration." Urban public services are mainly composed of four categories: "public security, basic education, basic medical care and social security."

This paper adopts the narrow concept of public service in order to distinguish it from public facilities and highlights the difference of household registration between urban and rural residents in terms of public service. Public services are mainly provided to meet the basic living requirements of citizens and, therefore, should be defined from the perspective of non-material products, which include five major services in employment, residence, social security, children's education and civil rights.

Therefore, the degree of urbanization of public service for urban non-registered residential population is jointly determined by the above five factors. Assuming that these five public services are of equal importance and are given equal weights, the degree of citizenization in accessing public services can be expressed with the following equation:

$$\alpha_S = \frac{\alpha_{S1} + \alpha_{S2} + \alpha_{S3} + \alpha_{S4} + \alpha_{S5}}{5}. \quad (3)$$

In this equation, α_{S1} represents the degree of citizenization of employment for agricultural registered population in city; α_{S2} represents the degree of citizenization of residence for agricultural registered population in city; α_{S3} represents the degree of citizenization of social security for agricultural registered population in city; α_{S4} represents the degree of citizenization of children's education for agricultural registered population in city, α_{S5} represents the degree of citizenization of civil rights for agricultural registered population in city.

As for the differences of employment, residence, social security, children's education and civil rights between migrant workers and citizens, this paper selects one to two specific statistical indicators from each factor for calculation. Five first-level indicators and nine second-level indicators in the citizenization of public service jointly constitute the measurement of real UR featured by "one standard and multiple dimensions" of (Table I).

3.3 Measurement of real UR

3.3.1 Degree of citizenization of employment. The increasing gap between urban and rural areas, as well as between workers and peasants leads more and more agricultural population to move and work in cities. Although they get more money after migrating to cities, they still face huge difference in the employment field and the means of labor from the urban registered population. Most rural migrant workers in China are poorly educated and have a low level of training. The types of job for rural migrant workers are mainly restricted to selling labor force with manufacturing being their most important employment industry. Besides, given that the way of employment for most rural migrant workers is irregular, their labor rights and interests cannot be fully guaranteed.

The coefficient of citizenization degree of migrant workers' employment is measured by the degree of the discrimination of employment for household registration. For a long time, there are obvious differences in the access of employment and occupation between agricultural and urban population in some cities in China. As shown in Table II, some large- and medium-sized cities impose clear-cut restrictions on the employment industries of

First-level indicator	Second-level indicator
Degree of citizenization of employment α_{S1}	(1) Degree of the discrimination of employment for household registration $\alpha_{S1.1}$
Degree of citizenization of residence α_{S2}	(1) Difference in the eligibility for security housing $\alpha_{S2.1}$ (2) Difference in the expenditure of housing α
Degree of citizenization of social security α_{S3}	(1) Difference in the coverage ratio of social security $\alpha_{S3.1}$ (2) Difference in the minimum living insurance $\alpha_{S3.2}$
Degree of citizenization of children's education α_{S4}	(1) Difference in the difficulties of admission $\alpha_{S4.1}$ (2) Difference in the educational expense $\alpha_{S4.2}$
Degree of citizenization of civil rights α_{S5}	(1) Difference in the right of political participation $\alpha_{S5.1}$ (2) Difference in the right to vote and the right to be voted $\alpha_{S5.2}$

Table I.
Determinants of
coefficient of degree
of citizenization of
public service

migrant workers, and implement the principle of “urban household holders first” when recruiting workers.

In order to protect the interests of rural migrant workers and maintain equal employment, our country has issued a series of employment policies against discrimination of household registration. In January 2003, the State Council issued “Notice on Better Management and Service to Rural Migrant Workers,” stipulating that “discriminatory policies and regulations targeting rural migrant workers should be abolished to protect their interests.” In January 2006, the State Council issued “Some Suggestions on Solving the Problems of Rural Migrant Workers,” further stressing the principle of applying “fair and non-discrimination policies” in the employment of rural migrant workers.

With the continuous attention paid by our country to the employment of rural migrant workers, the degree of discrimination of household registration in employment is gradually reduced, but it still exists to some extent. The Institute of Constitutionalism in China University of Political Science and Law conducted a survey on the discrimination of employment for household registration in top ten cities in China. The results showed that 28.7 percent of the employers, including state agencies, enterprises and public institutions

Year	Title of document	Content
1995	Classified management measures of the recruitment and use of non-local labor force by entities of Shanghai municipality	The types of work and industries in Shanghai are classified into three categories: category A refers to the types of work and industries that non-local labor force can engage in; Category B refers to the types of work and industries that non-local labor force can engage in only if necessary; Category C refers to the types of work and industries that non-local labor force cannot engage in All enterprises and public institutions belong to Category C work and industries
1996	The scope of types of work and industries for non-local persons allowed and limited by Beijing municipality (No. 2 circular issued by Beijing Municipal Labor Bureau)	Most of the 12 industries and 204 types of work that non-local workers are permitted to engage in are characterized by dirty, hard, tiring, dangerous and toxic industries
1996	Notice on the problems related to the recruitment of non-local workers issued by Beijing Municipal Labor Bureau	Employers should strictly adhere to the principle of “town first, countryside second, local city first and non-local second” in the recruitment of non-local workers
1999	Notice on the industries, occupations, education level and vocational skills of non-local workers allowed and restricted by Beijing municipality in 2000	The three types of work in which non-local workers are allowed to engage include garbage collector, corpse carrier, horticulture worker and other physical jobs. Industries that non-local workers are restricted to engaging in include eight industries of finance, insurance, postal service, real estate, advertisement, information consulting service, computer application service and travel agency
2001	Management measures of the recruitment and engagement of workers by entities of Dongguan	Employers should adhere to the principle of “local city first and non-local second, Guangdong first and other provinces second” in the recruitment of non-local workers. For posts in which the local labor force can be employed, employers must give priority to the qualified local laborers
2002	Implementing measures on the employment of Shenzhen residents according to a specific proportion	Employers of all trades should employ a certain proportion of residents in this city, with the industry of post and telecommunication no less than 60%; the industry of finance no less than 80%; and the industry of warehousing no less than 50%

Table II.
Discrimination of household registration for career access in documents issued by various cities

set explicit requirements of household registration in the recruitment, and 22.3 percent of them required local household registration (Yao, 2007).

To sum up, this paper sets the coefficient of citizenization degree of migrant workers' employment as 60 percent, that is, $\alpha_{S1.1} = 60$ percent.

3.3.2 Degree of citizenization of residence. The degree of citizenization of migrant workers' residence is measured by two indicators: the difference in the eligibility for security housing and the difference in the expenditure of housing.

China's security housing mainly serves urban registered population, and most rural migrant workers, limited by the nature of their household registration, cannot enjoy the same housing security policies as urban registered population.

The security housing mainly includes affordable housing: commercial housing with limited price, low-rent housing and public rental housing. Table III shows the differences in the eligibility for security housing between rural migrant workers and urban residents in Beijing.

According to "Guidance on the Development of Policy-oriented Commercial Housing with Common Property Right in Pilot Cities" issued by six ministries and departments including the Ministry of Housing and Urban-Rural Development (No. 174, 2014), Beijing, Shanghai, Shenzhen, Chengdu, Huai'an and Huangshi are selected as national pilot cities for the promotion of housing with common property right. In December 2017, the Beijing Housing and Urban-Rural Development Commission, Beijing Municipal Development and Reform Commission, Beijing Municipal Bureau of Finance, Beijing Municipal Commission of Urban Planning, Land and Resources jointly formulated "Beijing Municipal Interim Management Measures on Housing with Common Property Right." With regard to providing security housing for families without Beijing household registration, this document stipulates that "according to the demand of housing with common property right, people's government of each district should reasonably arrange the land of housing with common property right so as to meet the residence demands of eligible households and key talents. Among them, no less than 30 percent of the housing resources should be allocated to meet the residence demands of families without Beijing household registration who live in the local district." However, this policy of housing with common property right is still in the pilot phase and has not been put into practice nationwide.

In addition to the public rental housing and the newly started pilot housing with common property right, the eligibility for the other three types of security housing in Beijing is premised on the ownership of urban household registration; therefore, most rural migrant population cannot enjoy the benefits of housing security.

Similar to Beijing, the reform of housing security in most cities only covers public rental housing. In May 2013, the Wuhan Municipal Leading Group Meeting on Housing Security Work announced that the eligibility for public rental housing would pioneeringly cancel the restrictions of household registration and even migrant workers could enjoy the same policies as local residents. "Migrant workers who have obtained residence permits and meet the application requirements can also apply for registration with nearby communities or sub-district offices as local residents of Wuhan." However, the application of other types of security housing was only open to the urban registered population.

It can be observed that among above-mentioned four types of security housing, rural migrant workers are only eligible to apply for public rental housing, so we set the eligibility for security housing for rural migrant workers as 25 percent, that is, $\alpha_{S2.1} = 25$ percent.

About half of urban residents have already bought commercial housing or acquired security housing (National Population and Family Planning Commission, 2011), but rural migrant workers do not have their own houses in the cities where they work; therefore, their living costs are higher than those of urban residents. We use $\alpha_{S2.2}$ to represent the difference in the living costs between rural migrant workers and urban registered population. According to the national monitoring and investigation report of rural migrant workers

Type	Supply object	Application standard
Affordable housing	The applicants must have household registration in the local city for 3 years and reach the age of 18; applicants of single-person family must reach the age of 30; and the per capita housing area, family income and assets of the applying families must meet the government standards ^a	(1) One family member, annual income equal to or less than RMB 22,700; per capita housing area equal to or less than 10 m ² ; the net value of household assets equal to or less than RMB 240,000 (2) Two family members, annual income equal to or less than RMB 36,300; per capita housing area equal to or less than 10 m ² ; the net value of household assets equal to or less than RMB 270,000 (3) Three family members, annual income equal to or less than RMB 45,300; per capita housing area equal to or less than 10 m ² ; the net value of household assets equal to or less than RMB 360,000 (4) Four family members, annual income equal to or less than RMB 52,900; per capita housing area equal to or less than 10 m ² ; the net value of household assets equal to or less than RMB 450,000 (5) Five family members and above, annual income equal to or less than RMB 60,000; per capita housing area equal to or less than 10 m ² ; the net value of household assets equal to or less than RMB 480,000
Commercial housing with limited price	The applicant must have a registered permanent residence in the city, and the applicant must be at least 30 years old for a single-person family. The per capita housing area, family income and family assets of the applying families must meet the prescribed standards ^b	(1) Three family members or less, annual income equal to or less than RMB 88,000; per capita housing area equal to or less than 15 m ² ; the net value of household assets equal to or less than RMB 570,000 (2) Four family members and above, annual income equal to or less than RMB 116,000; per capita housing area equal to or less than 15 m ² ; the net value of household assets equal to or less than RMB 760,000
Low-rent housing	The applicant must have the registered permanent residence and live in the city . The per capita housing area, family income and family assets of the applying family must meet the prescribed standards ^c	(1) The average monthly income of each applying family last year must be less than RMB 580 for a consecutive year. The annual income of one-member family must be less than RMB 6,960, and that of two-member family must be less than RMB 13,920 (for each additional family member, an increase of RMB 6,960 will be calculated) (2) The total assets of the applying family must less than RMB 150,000 for one-member family, less than RMB 230,000 for two-member family, less than RMB 300,000 for three-member family, less than RMB 380,000 for four-member family, less than RMB 400,000 for five-member family and above (3) The per capita usable area of the family housing must be less than 7.5 m ² , and the applicants and their family members have not sold or transferred their properties within five years (4) Having one of the following circumstances: residence being removed; family members suffering from special diseases or serious disabilities; family member(s) at the age 60 or above; houses within the scope of risk removal determined by the municipal government, the number of family members applying for the allocation of low rent shall be more than two

Table III.
The eligibility for the
security housing in
Beijing

(continued)

Table III.

Type	Supply object	Application standard
Public rental housing	Having the registered permanent residence in Beijing or moving to Beijing from other provinces or cities to work continuously and steadily for a certain number of years, and the family income and housing conditions meet the prescribed standards ^d	<p>(1) Families waiting for low-rent housing, affordable housing, commercial housing with limited price</p> <p>(2) The applicants must have the local household registration and their per capita housing area must be equal to or less than 15 m²; the annual income of the family of three or less than three members must be equal to or less than RMB 100,000, and the annual income of the family of 4 or more than four members must be equal to or less than RMB 130,000</p> <p>(3) Migrant workers from other provinces or cities must have a stable job in Beijing for a certain number of years, and their family income must meet above standards. They must provide the certificate of temporary residence for the same period, the certificate of payment of housing accumulation fund or certificate of social insurance. Their family members (including themselves) cannot have house in this city</p>

Notes: ^aMeasures for the management of affordable housing in Beijing (trial); ^bmeasures for the Management of commercial housing with limited price in Beijing (trial); ^cmeasures for the management of low-rent housing in Beijing; ^dmeasures for the management of application, examination and allocation of public rental housing in Beijing

from 2013 to 2015, we can find the housing expenditure of rural migrant workers from 2012 to 2015, but there is no statistical data of other years. Based on the investigation of data available, it is found that the housing expenditure of rural migrant workers accounts for 15.5 percent of their income[20]. Hence, we estimate the housing expenditure of rural migrant workers in other years according to the proportion of 15.5 percent of the per capita income in those years. Specific data are shown in Table IV.

We define the citizenization degree of residence of rural migrant worker as arithmetic mean of the difference in the eligibility for security housing and the difference in housing expenditure between rural migrant workers and urban registered population. Its equation is as follows:

$$\alpha_{S2} = \frac{1}{2}(\alpha_{S2.2} + \alpha_{S2.2}). \quad (4)$$

Year	Rural migrant workers	Urban residents	Differences in housing expenditure (%)
2008	2,492	1,145.4	45.96
2009	2,636	1,228.9	46.63
2010	3,143	1,332.1	42.38
2011	3,811	1,405.0	36.87
2012	4,280	1,484.3	34.68
2013	5,436	1,579.9	29.06
2014	5,340	1,625.6	30.44
2015	5,700	1,665.9	29.23
2016	6,092	1,810.4	29.72
2017	6,482	1,986.8	30.65
2018	6,921	2,112.3 ^a	30.52

Note: ^aThe cash expenditure of residents' housing expenditure in 2018 is estimated, based on the per capita consumption expenditure of urban residents in 2018 and the proportion of housing expenditure in previous years

Sources: State Statistical Bureau (2013–2018)

Table IV.
Differences in housing
expenditure between
rural migrant workers
and urban residents
(unit: RMB)

The citizenization degrees of residence of rural migrant workers from 2008 to 2018 are shown in Table V.

From 2008 to 2018, the citizenization degree of residence of rural migrant workers in China was about 30 percent, but showed a downward trend.

3.3.3 Degree of citizenization of social security. The degree of citizenization of rural migrant workers' social security is measured by two indicators: the difference of coverage rate of social insurance and the difference of minimum subsistence allowance.

The coverage rate of social insurance includes the coverage rate of endowment insurance, medical insurance, unemployment insurance, work-related injury insurance and maternity insurance. The coverage rates of social insurance of rural migrant workers and urban registered population in China from 2008 to 2018 are shown in Table VI.

We use the ratio between the coverage rates of social security for the rural migrant workers and the urban registered population, that is $\alpha_{S3,1}$, to show the average difference between rural migrant workers and urban registered population in terms of the coverage rate of endowment insurance, medical insurance, unemployment insurance, work-related injury insurance and maternity insurance. The values of the difference between rural migrant workers and urban registered population from 2008 to 2018 are shown in Table VII.

We use the ratio between the minimum subsistence allowances for the rural migrant workers and the urban registered population, that is $\alpha_{S3,2}$, to show the difference between rural migrant workers and urban registered population in terms of the minimum subsistence allowance. The values of the difference of minimum subsistence allowance between rural migrant workers and urban registered population from 2008 to 2018 are shown in Table VIII.

We define the degree of citizenization of migrant workers' social security as the arithmetic mean of the difference of coverage rate of social security and the difference of minimum subsistence allowance between rural migrant workers and urban residents, which is expressed by the equation as follows:

$$\alpha_{S3} = \frac{1}{2}(\alpha_{S3,1} + \alpha_{S3,2}). \tag{5}$$

Through calculation in Tables VII and VIII, the coefficients of citizenization degree of migrant workers' social security from 2008 to 2018 are shown in Table IX.

Table V.
Citizenization degree
of residence of rural
migrant workers
(unit: percent)

Year	Difference in the eligibility for security housing	Difference in housing expenditure $\alpha_{S2,3}$	Coefficient of citizenization degree of residence $\alpha_{S2} = (1/2)(\alpha_{S2,1} + \alpha_{S2,2})$
2008	25	45.96	35.48
2009	25	46.63	35.82
2010	25	42.38	33.69
2011	25	36.87	30.94
2012	25	34.68	29.84
2013	25	29.06	27.03
2014	25	30.44	27.72
2015	25	29.23	27.12
2016	25	29.72	27.36
2017	25	30.65	27.83
2018	25	30.52	27.76

Year	Endowment insurance		Medical insurance		Unemployment insurance		Work-related injury insurance		Maternity insurance	
	Migrant workers	Urban residents	Migrant workers	Urban residents	Migrant workers	Urban residents	Migrant workers	Urban residents	Migrant workers	Urban residents
2008	9.8	51.7	13.1	46.7	3.7	35.9	24.1	29.3	2.0	29.1
2009	7.6	53.2	12.2	49.2	3.9	35.6	21.8	29.9	2.4	33.2
2010	9.5	55.9	14.3	51.3	4.9	32.8	24.1	28.4	2.9	33.5
2011	13.9	60.0	16.7	52.8	8.0	33.2	23.6	30.3	5.6	34.7
2012	14.3	61.9	16.9	53.5	8.4	33.6	24.0	31.9	6.1	36.9
2013	15.7	63.2	17.6	53.6	9.1	33.2	28.5	33.1	6.6	38.2
2014	16.7	64.9	17.6	53.5	10.5	33.0	26.2	33.8	7.8	37.9
2015	20.1	64.9	18.6	52.9	15.2	32.4	27	34.5	8.9	40.5
2016	21.1	67.2	17.1	52.4	16.5	32.4	26.7	34.7	9.9	41.9
2017	21.6	68.9	21.7	52.5	17.1	32.7	27.2	35.1	11.0	43.3
2018	23.8	71.6	21.1	54.3	17.9	34.2	28.3	36.4	12.0	44.7

Source: Ministry of Human Resources and Social Security, Statistical Bulletin on the Development of Human Resources and Social Security (2008–2017) (the data of coverage rate of maternity insurance from 2015 to 2017 and the relevant data in 2018 are estimated values)

Table VI.
Social insurance
coverage rate of
migrant workers and
urban residents
(unit: percent)

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2,2

The above analysis shows that the degree of citizenization of rural migrant workers' social security has generally increased in the past nine years, rising from 34.69 percent in 2008 to 57.64 percent in 2018, with an average annual increase of around 2.3 percentage points.

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Year	Endowment insurance	Medical insurance	Unemployment insurance	Work-related injury insurance	Maternity insurance	Difference of the coverage rate of social security
2008	19.0	28.1	10.3	82.3	6.9	29.3
2009	14.3	24.8	11.0	72.9	7.2	26.0
2010	17.0	27.9	14.9	84.9	8.7	30.7
2011	23.2	31.6	24.1	77.9	16.1	34.6
2012	23.1	31.6	25.0	75.2	16.5	34.3
2013	24.8	32.8	27.4	86.1	17.3	37.7
2014	25.7	32.9	31.8	77.5	20.6	37.7
2015	31.0	35.2	46.9	78.3	22.0	42.7
2016	31.4	32.6	50.9	76.9	23.8	43.1
2017	31.4	41.3	52.3	77.5	25.4	45.6
2018	33.3	38.9	52.3	77.8	26.9	45.8

Table VII.
 Difference in the coverage rates of social security between rural migrant workers and urban registered population (unit: percent)

Year	Rural migrant workers	Urban residents	Differences in minimum subsistence allowances (%)
2008	82.3	205.3	40.09
2009	100.8	227.8	44.25
2010	117.0	251.2	46.58
2011	143.2	287.6	49.79
2012	172.3	330.1	52.20
2013	202.8	373.0	54.37
2014	231.4	411.0	56.30
2015	264.8	451.1	58.70
2016	312.0	494.6	63.08
2017	358.3	540.6	66.28
2018	402.8	579.7	69.48

Table VIII.
 Difference of minimum subsistence allowances between rural migrant workers and urban registered population (unit: RMB/person, month)

Sources: State Statistical Bureau (2017), Statistical Bulletin on the Development of Social Service (2017) and Quarterly Report of Civil Administration Statistics (2018, 4th quarter)

Year	Differences of coverage rate of social insurance $\alpha_{S3.1}$	Differences of minimum subsistence allowances $\alpha_{S3.2}$	Coefficient of citizenization degree of social security $\alpha_{S3} = (1/2)(\alpha_{S3.1} + \alpha_{S3.2})$
2008	29.3	40.09	34.69
2009	26.0	44.25	35.14
2010	30.7	46.58	38.62
2011	34.6	49.79	42.19
2012	34.3	52.20	43.24
2013	37.7	54.37	46.03
2014	37.7	56.30	45.09
2015	42.7	58.70	50.70
2016	43.1	63.08	53.09
2017	45.6	66.28	55.94
2018	45.8	69.48	57.64

Table IX.
 Citizenization degree of rural migrant workers' social security (unit: percent)

3.3.4 Degree of citizenization of children's education. The citizenization degree of children's education of migrant workers is measured by two indicators: the difference of difficulty in school enrollment and the difference of education cost.

We use the ratio between the two rates of public school enrollment for children of migrant workers and of urban registered population, that is $\alpha_{S4.1}$, to represent the difference of school enrollment difficulty between rural migrant workers and urban registered population.

Some scholars conducted surveys on cities with a large migrant population in China, and the results showed that most of the migrant workers' children are enrolled in public schools (Lei, 2007; Han, 2006; Nanjing Municipal Statistical Bureau, 2008; Tian and Wu, 2010; Research Group on Investigation of Education and Database Construction of Children of Rural Migrant Workers in China, 2010). The research data on the situation of education of rural migrant workers' children in 2007 given by different scholars are summarized in Table X.

According to the results of the 16 cities mentioned above, the average rate of public school enrollment for rural migrant workers' children in China was 63 percent in 2007.

In recent years, with more attention being paid to the education of rural migrant workers' children, a growing number of children of rural migrant workers were enrolled in public schools. According to the statistics given by Ministry of Education, by the end of 2018, 80 percent of rural migrant workers' children have been enrolled in public schools and 7.5 percent have enjoyed the services of private school bought by government in the stage of compulsory education, all being included in the allowance of public funds per student and the policy of two exemptions and one subsidy. As a result, the sum of these two types of schooling was close to the proportion of public school enrollment in the stage of compulsory education[21].

From 2007 to 2018, the percentage of public school enrollment for migrant workers' children increased from 63 to 87.5 percent[22], with the average annual increase of 2.23 percentage points. Based on this speed of growth, this paper estimates that from 2008 to 2018, the rates of public school enrollment of rural migrant workers' children were 65.23, 67.46, 69.69, 71.92, 74.15, 76.38, 78.61, 80.84, 83.07, 85.30 and 87.53 percent, respectively.

City	Public schools	Private schools and others
Beijing	62.0	38.0
Shanghai	53.9	46.1
Hangzhou	68.4	31.6
Yiwu	37.8	62.2
Zhengzhou	81.3	18.7
Chengdu	58.2	41.8
Guangzhou	28.0	72.0
Shenzhen	40.0	60.0
Dongguan	26.9	73.1
Chongqing	75.6	24.4
Golmud	54.8	45.2
Urumchi	95.0	5.0
Shenyang	100.0	0.0
Nanjing	85.0	15.0
Zhuhai	55.2	44.8
Shijiazhuang	100.0	0.0
Xiamen	49	51

Table X.
Proportion of public
school enrollment for
migrant workers'
children (unit: percent)

Sources: Lei (2007), Nanjing Municipal Statistical Bureau (2008), Han (2006), Tian and Wu (2010) and Research Group on Investigation of Education and Database Construction of Children of Rural Migrant Workers in China (2010)

For urban registered population, their children have no difficulty in entering public schools, so we set their public school enrollment rate as 100 percent[23]; thus, the enrollment rate of migrant workers' children in public schools is equal to $\alpha_{S4.1}$; that is, from 2008 to 2018, the $\alpha_{S4.1}$ values are 65.23, 67.46, 69.69, 71.92, 74.15, 76.38, 78.61, 80.84, 83.07, 85.30 and 87.53 percent, respectively.

The difference of education cost is represented by $\alpha_{S4.2}$. The cost of compulsory education includes the tuition and miscellaneous fees and sponsorship fees (or temporary schooling fees). From the beginning of the Autumn semester of 2008, all tuition and miscellaneous fees for students of compulsory education in cities were exempted nationwide. However, sponsorship fees or temporary schooling fees were set in order to reduce the occupation of local education resources for migrant workers' children entering schools across regions. The cost of sponsorship fees or temporary schooling fees was based on household registration and only targeted non-registered population.

In 2010, the monitoring survey on migrant population conducted by the National Population and Family Planning Commission showed that 25.7 percent of migrant workers' children aged between 6 and 14 years in school need to pay sponsorship fees or temporary schooling fees, with an average payment of RMB 3,835 (Department of Service and Management of Migrant Population of National Population and Family Planning Commission, 2011).

Since the sponsorship fees or temporary schooling fees are levied on the non-registered population, urban registered residents need not to pay these fees. The difference of education cost between the children of migrant workers and children of urban residents is 74.3 percent, that is $\alpha_{S4.2} = 74.3$ percent[24].

We define the coefficient of citizenization degree of children's education for migrant workers as the arithmetic mean of the difference of difficulty in school enrollment and education cost between children of migrant workers and children of urban residents. Its equation is as follows:

$$\alpha_{S4} = \frac{1}{2}(\alpha_{S4.1} + \alpha_{S4.2}). \tag{6}$$

Plugging in relevant data, the citizenization degrees of education for migrant workers' children in China from 2008 to 2018 are shown in Table XI.

As can be seen from Table XI, from 2008 to 2018, the citizenization degree of children's education of migrant workers has been greatly improved from 69.77 to 89.92 percent, with

Table XI.
Citizenization degrees
of children's education
for migrant workers
(unit: percent)

Year	Difference of difficulty in school enrollment $\alpha_{S4.1}$	Difference in education cost $\alpha_{S4.2}$	Coefficient of citizenization degree of children's education $\alpha_{S4} = (1/2)(\alpha_{S4.1} + \alpha_{S4.2})$
2008	65.23	74.3	69.77
2009	67.46	74.3	70.88
2010	69.69	74.3	72.00
2011	71.92	74.3	73.11
2012	74.15	74.3	74.23
2013	76.38	74.3	75.34
2014	78.61	74.3	76.46
2015	80.84	74.3	77.57
2016	83.07	74.3	78.69
2017	85.30	74.3	79.80
2018	87.53	74.3	80.92

an increase of about 11.15 percentage points and an average annual increase of 1.1 percentage points.

3.3.5 Degree of citizenization of civil rights. The degree of citizenization of migrant workers' civil rights depends on the difference of the right to political participation and the difference of right to vote and to be voted.

We use $\alpha_{S5.1}$ to represent the difference of the right to political participation of migrant workers. The number of migrant workers who have awareness of political participation and often participate in politics is small. And their political participation is characterized by narrow scope, monotonous content, and low level and frequency.

It is difficult to calculate the difference of the right to political participation between migrant workers and urban registered population with corresponding data, so the present paper uses the qualitative method to assign values. Assuming that right to political participation of urban citizens is 1 and that of migrant workers is 0.5, the degree of relative difference is $\alpha_{S5.1} = 50$ percent.

The right to vote and to be voted is one of the most basic rights of Chinese citizens to participate in state administration. The National People's Congress is the organ of supreme power in China. Therefore, this paper uses the election of NPC deputies by migrant workers and urban citizens to present their right to vote and to be voted and uses $\alpha_{S5.2}$ to represent the difference in the rights to vote and to be voted between them based on the difference in the proportion of deputies to the people's congresses in urban and rural areas[25].

The number of rural deputies to the National People's Congress and their proportion in the total rural population, and the number of urban deputies to the National People's Congress and their proportion in the total urban population are shown in Table XII[26].

From the 1st to 13th National People's Congress, the difference in the proportion between urban and rural deputies increased from 0.95 to 24.21 percent. Farmers' right to vote and to be voted has been guaranteed continuously, but there is still a huge gap between them and the urban population in this regard. During five years from the 11th National People's Congress held in 2008 to the 12th National People's Congress, the difference in the proportion of deputies to National People's Congress between urban and rural areas increased from 4.49 to 8.65 percent, with an average annual increase of 0.832 percentage. During another five years from the 12th National People's Congress to the 13th National People's Congress, the difference in the proportion of deputies to National People's Congress between urban and rural areas increased from 8.65 to 24.12 percent, with an average annual increase of 3.112 percentage. According to the average growth speed during these two periods, the differences of the right to vote and to be voted between migrant workers and urban citizens in China from 2008 to 2018 were 4.49, 5.32, 6.15, 6.99, 7.82, 8.65, 11.76, 14.87, 17.99, 21.10 and 24.21 percent, respectively.

We define the citizenization degree of migrant workers' civil rights as the arithmetic mean of the difference of right to political participation and the difference of right to vote and to be voted between migrant workers and urban registered population, which can be expressed as:

$$\alpha_{S5} = \frac{1}{2}(\alpha_{S5.1} + \alpha_{S5.2}). \quad (7)$$

The degrees of citizenization of migrant workers' civil rights from 2008 to 2018 are shown in Table XIII.

It can be inferred from Table XIII that during the 10 years from 2008 to 2018, the degree of citizenization of migrant workers' civil rights in China increased from 27.25 to 37.11 percent, with an increase of about 9.9 percentage points and an average annual increase of 0.99 percentage points. However, although the degree of citizenization of

	Number of rural deputies (person)	Proportion of rural deputies in the total rural population ^a (%)	Number of urban deputies (person)	Proportion of urban deputies in the total urban population ^b (%)	Differences in the proportion of deputies to National People's Congresses (%)
1st session	63	0.000012	1,163	0.001260	0.95
2nd session	67	0.000012	1,159	0.000854	1.41
3rd session	209	0.000036	2,831	0.002424	1.49
4th session	662	0.000085	2,223	0.001557	5.46
5th session	720	0.000089	2,777	0.001823	4.88
6th session	348	0.000041	2,630	0.001431	2.87
7th session	308 ^c	0.000036	2,662	0.001180	3.05
8th session	280	0.000031	2,698	0.001037	2.99
9th session	240	0.000026	2,739	0.000899	2.89
10th session	551	0.000062	2,434	0.000650	9.54
11th session	246 ^d	0.000028	2,741	0.000623	4.49
12th session	401	0.000046	2,586	0.000532	8.65
13th session	468	0.000077	2,512	0.000318	24.21

Notes: ^aIn the calculation of the proportion of farmers' representatives to the rural population, the total rural population is calculated by the number of registered rural population at the end of the year when the People's Congress was held; ^bin the calculation of the proportion of urban representatives in the urban population, the total urban population is calculated by the number of registered urban population at the end of the year when the People's Congress was held; ^cbecause the delegation structure of the seventh session of the National People's Congress published by *People's Daily* only depicted representatives of workers and farmers, without a separate list of representatives of farmers, the present paper calculates the number of farmers' representatives in the seventh session of the National People's Congress by averaging the proportion of farmers' representatives to the representatives of workers and farmers to the previous and following sessions of the National People's Congress; ^daccording to "Analysis of the Characteristics of Representatives to the 12th National People's Congress" by Xinhua News Agency, there are 401 front-line workers and farmers, accounting for 13.42 percent of the total number of representatives, with 5.18 percentage points higher than the 11th National People's Congress. Because the actual number of workers' and farmers' representatives in the 11th session has not been found, the figure here is obtained by multiplying the total number of representatives with the proportion of workers' and farmers' representatives

Sources: *People's Daily* (1999), State Statistical Bureau (2013), Analysis of the Characteristics of Deputies to the 12th National People's Congress by the Xinhua News Agency and Report on the Condition of Election of Deputies to the 13th National People's Congress, General Office of the Standing Committee of NPC

Table XII.
Difference in the
proportion of deputies
to National People's
Congress between
urban and rural areas

Year	Difference of right to political participation $\alpha_{S5.1}$	Difference of right to vote and to be voted $\alpha_{S5.2}$	Coefficient of the citizenization degree of migrant workers' civil rights $\alpha_{S2} = (1/2)(\alpha_{S5.1} + \alpha_{S5.2})$
2008	50	4.49	27.25
2009	50	5.32	27.66
2010	50	6.15	28.08
2011	50	6.99	28.50
2012	50	7.82	28.91
2013	50	8.65	29.33
2014	50	11.76	30.88
2015	50	14.87	32.44
2016	50	17.99	34.00
2017	50	21.10	35.55
2018	50	24.21	37.11

Table XIII.
Coefficients of
citizenization degree
of migrant workers'
civil rights (unit:
percent)

migrant workers' civil rights has been improved rapidly in the past five years, its level is still low.

After the calculation of the citizenization degrees of migrant workers in terms of employment, residence, social security, children's education and civil rights, we can estimate the citizenization degree of migrant workers in accessing public services in China. Assuming that the weights of the above five indicators are the same, the arithmetic mean of the above five indicators will indicate the citizenization degree of migrant workers in accessing public services in China from 2008 to 2018, as shown in Table XIV.

It can be seen from Table XIV that from 2008 to 2018, the citizenization degree of migrant workers in accessing public services in China has steadily increased from 45.44 to 52.69 percent, with an increase of 7.25 percentage points. The citizenization degree in public services of slightly over 50 percent indicates that more than half of migrant workers in China can enjoy the social welfare level as urban population in terms of public services.

Next, we calculate the mean of citizenization degree of migrant workers in accessing public facilities and the citizenization degree of migrant workers in accessing public services, as shown in equation:

$$\alpha = \frac{1}{2}(1 + \alpha_S). \quad (8)$$

Calculation reveals that the degrees of citizenization of migrant workers in China from 2008 to 2018 are 72.72, 72.95, 73.24, 73.47, 73.62, 73.77, 74.02, 74.78, 75.31, 75.91 and 76.34 percent, respectively.

By plugging the data of the citizenization degree of migrant workers into the equation (Equation (1)), we can find that the real UR of China from 2008 to 2018 is between the UR of registered population and that of residing population, as shown in Table XV.

The results of three measuring methods of UR can also be shown in Figure 3.

As can be identified from Table XV, during the 10 years from 2008 to 2018, the UR of registered population increased by 10.09 percentage points, the UR of residing population increased by 12.59 percentage points, and the real UR increased by 12.50 percentage points. Compared with the other two officially announced URs, the growth of real UR is slightly lower than that of UR of residing population but substantially higher than that of registered population, which helps to correct the overestimated result of the UR of residing population

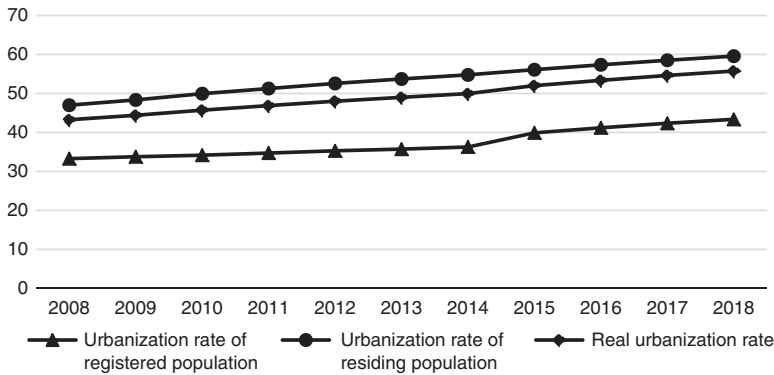
Year	Employment α_{S1}	Residence α_{S2}	Social security α_{S3}	Children's education α_{S4}	Civil right α_{S5}	Coefficient of citizenization degree of migrant workers in accessing public services $\alpha_S = (1/5)(\alpha_{S1} + \alpha_{S2} + \alpha_{S3} + \alpha_{S4} + \alpha_{S5})$
2008	60	35.48	34.69	69.77	27.25	45.44
2009	60	35.82	35.14	70.88	27.66	45.90
2010	60	33.69	38.62	72.00	28.08	46.48
2011	60	30.94	42.19	73.11	28.50	46.95
2012	60	29.84	43.24	74.23	28.91	47.24
2013	60	27.03	46.03	75.34	29.33	47.55
2014	60	27.72	45.09	76.46	30.88	48.03
2015	60	27.12	50.70	77.57	32.44	49.57
2016	60	27.36	53.09	78.69	34.00	50.63
2017	60	27.83	55.94	79.80	35.55	51.82
2018	60	27.76	57.64	80.92	37.11	52.69

Table XIV.
Coefficients of
citizenization degree
of migrant workers in
accessing public
services (unit: percent)

Table XV.
Real urbanization rate
in China (unit:
percent)

Year	Urbanization rate of registered population	Urbanization rate of residing population	Real urbanization rate
2008	33.28	46.99	43.25
2009	33.77	48.34	44.40
2010	34.17	49.95	45.73
2011	34.71	51.27	46.88
2012	35.29	52.57	48.01
2013	35.72	53.72	49.00
2014	36.27	54.77	49.96
2015	39.90	56.10	52.01
2016	41.20	57.35	53.36
2017	42.35	58.52	54.62
2018	43.37	59.58	55.75

Figure 3.
Comparison of
different measuring
methods of
urbanization rate
(unit: percent)



and the underestimated result of the UR of registered population in terms of absolute value and can more accurately measure the urbanization status quo and its trend in China.

From 2008 to 2018, the coefficient of degree of citizenization in China increased from 72.72 to 76.34 percent, with an average annual increase of 0.36 percentage points. The continuous increase of degree of citizenization of rural migrant workers indicates that the living quality and welfare of rural migrant workers in China are getting closer to that of urban registered population, which lifts the real urbanization level. The measurement of real UR does more than the simple statistical calculation of residing or registered population, and it also takes into consideration the real situation of population, therefore it is a more scientific method to measure urbanization level.

3.4 International comparison of UR

The level of urbanization is closely related to the level of economic development. According to the classic s-type urbanization model, in the early stage of economic development, UR grows slowly with the increase of per capita income, followed by a period of rapid growth. When per capita income reaches a high level, the growth speed of urbanization will slow down again.

Todaro and Smith (2009) point out that “the positive relationship between UR and per capita income is one of the most obvious and significant characteristics in the process of development.” Typically, countries with high per capita incomes are among the highest urbanized countries in the world.

This paper uses the proportion of urban population to the whole population to represent the UR and the per capita GDP to represent the level of economic development. Relevant data of 45 countries and regions in 2005, 2010 and 2015 are selected to test the correlation between these two indicators (Table XVI).

Real
urbanization
level in China

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	Proportion of urban population to the whole population (%)			Per capita GDP (USD)		
	2005	2010	2015	2005	2010	2015
World	49	51.5	53.9	7,237.2	9,481.6	9,995.6
China	42.5	49.2	55.6	1,740.1	4,514.9	7,924.7
Hong Kong	100	100	100	26,649.8	32,550	42,422.9
Macao	100	100	100	25,830	52,604.3	78,585.9
Bangladesh	26.8	30.5	34.3	485.9	760.3	1,211.7
Brunei	73.5	75.5	77.2	26,337.9	31,453.2	36,607.9
Cambodia	19.2	19.8	20.7	472.4	782.7	1,158.7
India	29.2	30.9	32.7	729	1,387.9	1,581.6
Indonesia	45.9	49.9	53.7	1,263.5	3,125.2	3,346.5
Iran	67.6	70.6	73.4	3,135.2	6,299.9	0
Israel	91.5	91.8	92.1	20,611.2	30,736.4	35,329.5
Japan	86	90.5	93.5	35,781.2	42,935.3	32,477.2
Kazakhstan	54.7	53.7	53.2	3,771.3	9,070.7	10,508.4
Korea	81.3	81.9	82.5	18,657.5	22,151.2	27,221.5
Laos	27.4	33.1	38.6	476.2	1,147.1	1,812.3
Malaysia	66.6	70.9	74.7	5,564.2	9,069	9,766.2
Mongolia	62.5	67.6	72	998.8	2,650.3	3,973.4
Myanmar	28.9	31.4	34.1	0	0	1,203.5
Pakistan	34.7	36.6	38.8	714	1,043.3	1,429
The Philippines	46.6	45.3	44.4	1,196.5	2,145.2	2,899.4
Singapore	100	100	100	29,869.9	46,569.7	52,888.7
Sri Lanka	18.4	18.3	18.4	1,259.8	2,819.7	3,926.2
Thailand	37.5	44.1	50.4	2,874.4	5,111.9	5,816.4
Vietnam	27.3	30.4	33.6	699.5	1,333.6	2,111.1
Egypt	43	43	43.1	1,196.7	2,668	3,614.7
Nigeria	39.1	43.5	47.8	804	2,315	2,640.3
South Africa	59.5	62.2	64.8	5,453.2	7,392.9	5,691.7
Canada	80.1	80.9	81.8	36,189.6	47,445.8	43,248.5
Mexico	76.3	77.8	79.2	7894	8,861.5	9,009.3
America	79.9	80.8	81.6	44,307.9	48,374.1	55,836.8
Argentina	90.1	91	91.8	5,640.8	11,198.6	0
Brazil	82.8	84.3	85.7	4,730.7	11,121.4	8,538.6
Venezuela	88.6	88.8	89	5,435.9	13,581.4	0
Czech Republic	73.6	73.3	73	13,317.7	19,764	17,231.3
France	77.1	78.3	79.5	34,879.7	40,705.8	36,248.2
Germany	73.4	74.3	75.3	34,696.6	41,788	41,219
Italy	67.7	68.3	69	31,959.3	35,851.5	29,847.1
Netherlands	82.6	87.1	90.5	41,577.2	50,341.3	44,433.4
Poland	61.5	60.9	60.5	7,976.1	12,597.5	12,494.5
Russia	73.5	73.7	74	5,323.5	10,675	9,057.1
Spain	77.3	78.4	79.6	26,510.7	30,737.8	25,831.6
Turkey	67.8	70.7	73.4	7,117.2	10,111.5	9,130
Ukraine	67.8	68.7	69.7	1,828.7	2974	2,115
Britain	79.9	81.3	82.6	40,047.9	38,292.9	43,734
Australia	88	88.7	89.4	33,983	51,845.7	56,327.7
New Zealand	86.1	86.2	86.3	27,750.9	33,692.2	37,808

Source: State Statistical Bureau (2016)

Table XVI.
Urbanization rate and
per capita GDP data
of 45 countries and
regions (unit: percent,
US dollar)

CPE
2,2

Assume that the urbanization level of a country or region is UR and its GDP per capita is GDPP, and then:

$$UR = \alpha + GDPP + c.$$

(9)

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The regression analysis of UR and per capita GDP is conducted in 2005, 2010 and 2015 separately, and the results are shown in Table XVII.

As can be seen from Table XVII, the regression equation of the said three years can be verified effectively, which shows that the level of urbanization is connected with the level of economic development to some extent. With the rising of the economic level, the urbanization level also rises. Besides, the elasticity between urbanization level and economic development level gradually decrease as years go by indicating that when the economy reaches a certain scale, the urbanization level will slow down.

By plugging China’s per capita GDP in the corresponding year into the regression results in Table XVII, China’s UR that corresponds to the world regular pattern can be obtained (Table XVIII).

The UR of China calculated on the basis of world data is consistent with the regular pattern of world development. This paper names it the world standard value, which can be used as a reference for the standard level of China’s urbanization.

It can be seen from Table XIX that the UR of China is lower than the world standard value, no matter how it is measured. Therefore, it can be concluded that China’s urbanization level lags behind the level of economic development, and the level and speed of urbanization still need to be greatly improved.

Table XVII.
Regression results of
UR and GDPP

Year	Result	R^2	F
2005	$UR = 48.50907 + 0.0011046GDPP$	0.4697	38.97
2010	$UR = 47.69943 + 0.0009641GDPP$	0.564	56.93
2015	$UR = 53.08629 + 0.0007526GDPP$	0.4605	37.56

Table XVIII.
China’s urbanization
level corresponding to
the world regular
pattern

Year	Equation	GDPP (USD)	UR (%)
2005	$UR = 48.50907 + 0.0011046GDPP$	1,740.1	50.43
2010	$UR = 47.69943 + 0.0009641GDPP$	4,514.9	52.05
2015	$UR = 53.08629 + 0.0007526GDPP$	7,924.7	59.05

Source: State Statistical Bureau (2016)

Table XIX.
Comparison of
urbanization rate
calculated by different
methods of
measurement
(unit: percent)

Year	Urbanization rate of registered population	Urbanization rate of residing population	Real urbanization rate	World standard value
2005	31.99	42.99		50.43
2010	34.17	49.95	45.73	52.05
2015	39.90	56.10	52.01	59.05

3.5 Further revision of the real UR

In China, there are significant differences between cities and towns in the level of economic development and the degree of modernization. Generally speaking, towns are sparsely populated, with old public facilities and lower public service levels than urban areas. Sun Rui and Yuan Lingling (2013) point out that even in developed towns in China, there are still problems such as weak service concept, monotonous service content and low service quality, hence a large gap from cities. Therefore, compared with the city population, the townsmen enjoys a lower level of infrastructure and public services, and they should also be converted into “citizenization degree” in a certain proportion.

The previous measurement of real UR calculates the UR in a broad sense, which includes both city population and township population. If we look at the narrow sense of UR which only includes the city population and excludes the township population, the final UR will decline further. Below, we will incorporate the differences of public facilities and services between cities and towns into the measurement of UR and make further revisions to the real UR.

Considering the unavailability of data in non-census years, this paper assumes that the degree of citizenization of temporary residents in cities is α , the degree of citizenization of registered population in towns β , and the degree of citizenization of temporary residents in towns γ . The equation of calculation of real UR will be further revised as follows:

$$\text{Real urbanization rate} = \frac{\text{Real urban population}}{\text{Whole population}} = \frac{\text{Urban registered population} + \alpha \times \text{Temporary population in cities} + \beta \times \text{Registered population in towns} + \gamma \times \text{Temporary population in towns}}{\text{Whole population}} \quad (10)$$

Similar to the citizenization degree of rural migrant workers, the citizenization degree of township population depends on the difference of levels of public infrastructure and services between cities and towns.

Here, we make a simple estimate. Based on the data from the Ministry of Housing and Urban-Rural Development in 2017, the registered population of urban areas above the level of county is 409.757m, the temporary population in urban areas is 81.641m, the registered population in counties is 139.225m, the temporary population in counties is 17.009m, the population in administrative towns is 155.238m, the temporary population in administrative towns is 32.201m[27] and the total population of China is 139.008m. According to the previous result, it was calculated that the coefficient of citizenization degree of rural migrant workers was 75.91 percent. Assuming that the gap of public service level between registered non-agricultural population and the registered agricultural population in towns is small and that the citizenization degree of the registered agricultural population in towns is around 90 percent of that of registered non-agricultural population, the coefficient of citizenization degree of registered agricultural population $\beta = 70$ percent and that of registered non-agricultural population $\gamma = 63$ percent, then the revised rate of real urbanization should be 50.99 percent in 2017.

In 2017, the UR of registered population was 42.35 percent, the UR of residing population was 58.52 percent, the real UR was 54.62 percent, and the revised real UR was 50.99 percent. After correction, the real UR decreases further and approaches the UR of registered population. It can be inferred that the real UR in China is still very low. To further accelerate the urbanization process, we should not only develop the citizenization of rural migrant workers, but also gradually promote the citizenization of township residents.

4. The target of national new townization: 2020

According to the goals of the “Plan of National New Townization (2014-2020),” by 2020, the townization rate of the residing population will reach 60 percent and the townization rate of the registered population will reach about 45 percent, and the gap between these two will be

narrowed to 15 percentage points. At the end of 2018, these two types of townization rate were 59.58 and 43.37 percent, respectively, with a gap of 16.21 percentage points, which means among 831m residing urban residents, 226m have no urban household registration. According to the speed of UR during past three years, if the UR of residing population increases by 1.12 percentage points annually and that of registered population increases by 1.09 percentage points, the gap between these two will grow year by year. It is expected that by the end of 2020, the gap between urban residing population and that of registered population will reach around 228m.

It is worth noting that the majority of the growth of urban registered population is due to the upgrade of the system of administrations, that is, the change of a county into a city, a town into a district, and a village committee into a neighborhood committee. Therefore, although rural population suddenly became registered township population, they do not really enjoy the level of public facilities and public services that registered city population can enjoy. As a result, China's real UR may be much lower than the official figures. Only when our government narrows the gap of compulsory education, employment services, basic endowment insurance, social security and other public services between rural migrant workers and urban residents, the goal of townization rate of residing population can bear practical economic and social significance.

In addition, the added value of primary industry (agriculture) in 2018 only accounts for 7.2 percent of GDP, but working people in the field of agriculture occupies 25.04 percent of the country's total, suggesting that the level of real urbanization not only lags behind the average level of the world, but also lags behind the level of industrialization in our country. For this reason, to further speed up the urbanization process should be given the top priority in the construction of the "New Four Modernizations"[28].

Notes

1. The data of Statistical Yearbook of Urban and Rural Construction in 2017 are used here for explanation since relevant information about administrative towns in 2018 has not been published by the Ministry of Housing and Urban-Rural Development.
2. A saying in *The Book of Changes* goes that the Chinese character "hua" presents the ultimate result of change.
3. The "Academic Seminar of China's Path" held by the academic circle of urban and regional planning as well as geographic field in 1982 in Nanjing clearly states that "urbanization" and "townization" are synonymy and suggests that "townization" should be replaced by "urbanization" to avoid misunderstanding.
4. *Oxford Advanced Learner's English-Chinese Dictionary* (4th ed.), Commercial Press, Oxford University Press (1997 Version), p. 1673.
5. See *Merriam-Webster's Ninth Collegiate Dictionary*, Merriam-Webster, 1983.
6. See Gao Peiyi (1991) for the translation of the word "urbanization," and the use of "urbanization" and "townization."
7. The classification of income level is based on the data of per capita national income given by the World Bank in 2016.
8. This is from the data of urbanization level of all countries in 2017 in the United Nations' "Urban Population Prospects 2018 Revision."
9. Since the data of urban population before 1982 released by the State Statistical Bureau is based on the measurement of registered population, in order to depict the speed of development of urbanization in China more scientifically and reasonably, the urbanization level in 1982 is compared with that at the present.

10. The average annual growth rate of urbanization in Japan, South Korea and Taiwan is the geometric average of the total growth rate.
11. The data come from the statistics of Japanese historical population on the website of the Statistics Bureau of Japan, www.stat.go.jp/english/data/chouki/02.html
12. The data come from census data of South Korea in Korean Statistic Information Service (KOSIS) starting from 1970, http://eng/eng/statisticsList/statisticsList_01List.jsp?vwcd=MT_ETITLE&parmTabId=M_01_01
13. This is from the data of “Monthly Statistical Report of “the Republic of China” compiled by Li Fei (1987).
14. In November 1984 and April 1986, the State Council endorsed “Report on Adjusting the Standards for the Establishment of Towns” and “Report on Adjusting the Standards for the Establishment of Cities and the Conditions for the Establishment of Counties under the Leadership of Cities” proposed by the Ministry of Civil Affairs, which greatly relaxed the previous standards for the establishment of towns and cities. And from then on, a large quantity of rural townships is transferred to towns and counties to cities.
15. Data sources: “Investigation Report on the Left-behind Children in Rural Areas in China and the Condition of Migrant Children in Urban and Rural Areas,” released by the All-China Women’s Federation, May 2013; “Hardships and Expectation of China’s Fifty Million Left-behind Women”, Xinhua News Agency, 2011; Answers from an official in charge of the Ministry of Civil Affairs to reporters about the document “Several Opinions of the State Council on the Acceleration of the Development of Elderly Service Industry”, September 2013, (National decree (2013) No. 35). But since 2016, the government has revised the figures to 6.97m left-behind children, 34.26m migrant children, 47m left-behind women and 16m left-behind elderly (see answers from Ni Chunxia, Deputy Director of the Department of Social Affairs of the Ministry of Civil Affairs, to reporters on October 30, 2018; “Report on the Development of China’s Migrant Population in 2018” released by the National Health Commission; the regular news conference for the first quarter of 2018 given by the Ministry of Civil Affairs).
16. The research of this section refers to Du Guonan’s doctoral dissertation “On the Measurement of China’s Real Urbanization Rate” (School of Social Sciences, Tsinghua University, 2014) and Du Guonan and Cai Jiming (2013).
17. In Beijing, for example, children of non-registered residing population are not allowed to take the college entrance examination and are only allowed to enroll in vocational schools. In addition, they can’t even get employed in the ride-hailing services without Beijing household registration.
18. The definition of urban public facilities comes from *Dictionary of Environmental Science*, China Environmental Science Press, 1991, p.52.
19. The classification of urban public facilities mainly refers to *Dictionary of Building Economy*, Shanghai Academy of Social Sciences Press, 1990.
20. In 2013, housing expenditure occupied 17 percent of the income, higher than the average level of 15.5 percent in other years. Consider that there may be some anomalies in the data, so data in 2013 was not included in the calculation of housing expenditure in other years.
21. The Ministry of Education held a press conference to introduce the major issues and difficulties in the progress of basic education, www.gov.cn/xinwen/2018-12/13/content_5348498.htm#1
22. Here, 7.5 percent of migrant workers’ children enrolled in private schools who enjoy the public funds per student and the policy of two exemption and one subsidy are included into to the proportion of students in public schools.
23. Ignore the fact that a minority of high-income families send their children to private schools.
24. Although on December 24, 2010 “Decision of the Ministry of Education on the Amendment and Abolition of Some Regulations” has already removed the regulation that non-registered students in local areas can be charged with temporary schooling fees, which is included in the

“Management and Procedure on Primary Schools,” there still, to some extent, exists the phenomenon of arbitrary collection of fees. Therefore, the present article uses the relevant statistical data on the difference of expenditures of education between the urban residents’ children and rural migrant workers’ children in 2010.

25. The “Electoral Law” established in 1953 regulated that among the representatives in the National People’s Congress, the proportion of population that each representative in the rural and urban areas should represent is 8:1. In the revision of the “Electoral Law” in 1995, the proportion of 8:1 was changed to 4:1. In the 3rd Session of the 11th National People’s Congress, the revised “Electoral Law” stipulated that the election of the representatives of the National People’s Congress should be based on the same proportion of representatives to the represented population, which realized the equality of the right to vote for both urban and rural residents in the legal sense. Moreover, the proportion of rural migrant workers to the representatives of the National People’s Congress also increased in recent years, indicating that the right to vote and to be voted of farmers (and rural migrant workers) has drawn further attention and has been guaranteed. Nevertheless, by the comparison of rural and urban representatives of National People’s Congresses, the proportion of farmers’ representatives is still relatively low. Therefore, this paper depicts the right to vote and to be voted according to real data.
26. Due to limited statistical data, the number of farmers’ representatives to the 10th, 11th, 12th and 13th National People’s Congresses is the total number of workers’ and farmers’ representatives.
27. In *Statistical Yearbook of Urban and Rural Construction 2017*, for lack of the data of temporary population in administrative towns, the data of 2016 are used instead.
28. The “New Four Modernizations” refers to the “new type of industrialization, informatization, urbanization and agricultural modernization” proposed in the report of the 18th CPC National Congress, which corresponds to the to-be-realized “modernizations of agriculture, industry, national defense and science and technology” in the twentieth century, proposed by deceased Premier Zhou Enlai at the 1st Session of the 4th National People’s Congress.

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Corresponding author

Jiming Cai can be contacted at: jmcai@tsinghua.edu.cn