



## Evolution and assessment on China's urbanization 1960–2010: Under-urbanization or over-urbanization?

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### A B S T R A C T

#### Keywords:

Evolution  
Under-urbanization  
Over-urbanization  
Assessment  
China

There has been a significant transformation in the urbanization and economic growth in post-reform China. The nature and degree of urbanization is a subject of some controversy. This paper examines empirical data for 110 counties and employs a quadrant plots method involving estimation of several parameters to analyze empirically the evolvement of urbanization in China during 1960–2010. There are three periods of China's urbanization in the pattern of world, which is the rapid decline stage (1960–1978), the stable stage of ascension (1979–1995) and rapid promotion stage (1996–2010). Over the entire period, compared to the rest of the world, urbanization and economic growth in China appears to be coordinated and at moderate levels. However, China's urbanization process has progressed faster than economic growth since 2004, and it is right time that China should rethink under-urbanization and its countermeasure in development strategy. And the core of new stage of urbanization is to improve the quality of urbanization and to take little count of urbanization quantity.

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### Introduction

World urbanization trends have been irreversible since the second half of the 20th century. The world's population is increasingly found in the cities. According to a report of world urbanization prospects by United Nations, more than half of the world's population lived in urban areas by the end of 2008 (UNPD, 2010). Generally, levels of urbanization are closely correlated with levels of economic development (Henderson, 2003). Demographic processes of immigration and emigration are important determinants of urbanization, but these are in turn underpinned by other processes, especially economic change. Developed countries are considered to experience “parallel-urbanization”, achieving high industrial growth and a parallel increase in the degree of urbanization. Most of these countries have entered the third stage of urbanization, and the urbanization level has stabilized. The focus of world urbanization had shifted to the developing world. Developed and the developing countries pursue two different paths: in developed countries urbanization and economic development were synchronized, whereas developing countries over- and under-

urbanization is common. A great deal of literature has been generated dealing with the special characteristics of “over-urbanization” or “excessive-urbanization, common phenomena and processes of formation, and the new challenges posed by developing countries (Cohen, 2006; Henderson, 2002; Skeldon, 1999). The conclusions of this research have led to a basic consensus. However, China's road to urbanization has been thought of as unique for it is neither identical with that of the developed economies nor does it duplicate the path of developing countries (Zhang & Zhao, 2003), posing a puzzling riddle. In recent decades, a great amount of ink has been spilled by planners, economists, and geographers to paint a picture of China's urbanization (Chen & Gao, 2011; Friedmann, 2006; Lin, 1998, 2007; Shen, 2005, 2006). Interestingly, as research opinions vary, no unanimous conclusion can be drawn about China's urbanization level. Some hold that in both the pre-reform era and the period of economic transition, China has tried to restrict rural–urban migration and the number of people entitled to an urban citizenship, while its economic growth seems impressive. Despite very dynamic recent rural–urban migration, official figures as well as academic estimates of the level of urbanization remain low. Indeed, China's under-urbanization grew in the recent period of reform, the reason being that economic growth outpaced urbanization (Chang & Brada, 2006). However, others believe that China has been eliminating this urbanization gap during the post-1978 period as a result of its economic reforms.

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China's urban population increased dramatically from 170 million in 1978 to 670 million in 2010 and the urban share of the total population rose from a mere 18%–50%. The most noticeable evidence associated with China's over-urbanization is the dramatic increases in the number of peasant workers (*non-gmingong* in Chinese) and urbanization of land (Lu et al., 2007). Although much effort is being spent examining China's urbanization, it is clear that there is no shortage of controversy, and that quantitative assessments are difficult (Zhang & Zhao, 2003). There are two critical problems to be solved: one is identifying a perspective for the study of dynamic evolutions; the other is developing a quantitative method to assess effectively the relationship between levels of urbanization and economic development level.

In a cross-country panel data context, the purpose of this paper is to design a quantitative analytical frame work and to come up with a better understanding of the evolution of China's urbanization. The paper is organized as follows. The next section will introduce the research data and method. In section three, the evolution of China's urbanization is analyzed along three dimensions are examined. This will be followed by a discussion of three viewpoints relating to the assessment of China's urbanization. Some conclusions are reached in the final section.

## Research data and method

### Data

Two key indicators are selected to measure the development level, GDP per capita (GDPPC) and the urbanization level (URBANL). The research data comes mainly from the World Bank online database (<http://data.worldbank.org/>). GDP per capita is gross domestic product divided by the midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making adjustments for inflation for two main reasons: Firstly, a reliable and continuous CPI index (showing the inflation rate) is not available. Only a current price index of GDP per capita exists for the areas under study. Secondly, Z-score normalization was applied to the panel data used in this study. Using this method GDP per capita data can be compared in ways that reduce the impact of changes in the CPI on research results. The urbanization level is represented by the ratio of the urban population to overall population. The urban population refers to people living in urban areas as defined by national statistical offices. It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanization Prospects. The research draws on annual data for a 51 year period from 1960 to 2010. The geographical coverage of the World Bank data is for a sample of 226 countries and regions in the world. 110 sample points are retained, some of which are excluded if sample data are missing in any year from 1960 to 2010.

There is considerable controversy about the urbanization level in China. In spite of the fact that some scholars made effective amendments to official city data, no revised time-series of urbanization data is as yet widely accepted. The data relating to China's urbanization level therefore comes from the "2011 China Statistical Yearbook" published by Chinese National Bureau of Statistics. More importantly, the Chinese official data is the basis for relevant national urbanization policies.

### The four-quadrants map method (FQM)

To determine whether the urbanization level in China outpaces its economic development level, we used FQM method to assess

China's urbanization in the past 51 years. Mathematically, the Cartesian coordinate system in two dimensions is defined by an ordered pair of perpendicular lines, a single unit of length for both axes, and an orientation for each axis. The lines are referred to as the *x*- and *y*-axis, where the *x*-axis is taken to be horizontal, and the *y*-axis is taken to be vertical. The four quadrants into which a plane is divided by the reference axes, axis *X* and axis *Y*, in a Cartesian coordinate system, can be designated as, first ( $X > 0, Y > 0$ ), second ( $X < 0, Y > 0$ ), third ( $X < 0, Y < 0$ ) and, fourth ( $X > 0, Y < 0$ ).

Indicators of the annual urbanization level and economic development level in different countries form the columns and rows of data respectively. The data was standardized by computing the deviations of the two indicators from their respective means. The data points for the different countries are then plotted as a set of scattered points on a Cartesian coordinate system. The location of each point depends on the degree of deviation of the urbanization and economic development of each country compared to the average level for all countries in research sample. It is safe to say, in fact, that there is standard experienced development pattern for all countries taken together. This standard pattern is the criterion against which each country is compared. Each country's path is compared against the world development pattern.

Furthermore, it is important to note that FQM is particularly reliant on an important assumption, namely that the proportion of a country's population living in urban areas is highly correlated with its level of economic development. Although there may be a situation in which the urbanization level exceeds or falls short of the average for its level of economic development, most countries in the world as a whole should maintain a long-term balanced relationship between urbanization and economic development. This assumption makes it possible to identify the nature of China's urbanization path by comparing it with the evolution of the development pattern of all of the countries in the world taken together.

### Data processing

- i) Two indicators GDPPC, URBANL data were normalized to generate two new variables ZGDPPC and ZURBANL. Normalization served two purposes: first, it eliminated the influence of the dimension of different data sources; second, it resulted in the expression of the sample values for each year as a number of standard deviations from the sample mean for that year.

Z-score normalization involved computing

$$z = (x_i - \bar{x})/s$$

where:  $x_i$  is the raw score of *i* country in the sample to be standardized;  $\bar{x}$  is the mean of the indicator,  $\bar{x} = \sum x/n$ ; and *s* is the sample standard deviation of the indicator,

$$s = \sqrt{\sum (x_i - \bar{x})^2 / (n - 1)}.$$

- ii) Plotting ZGDPPC on the *X*-axis, ZURBANL on the *Y*-axis, different countries form a set of scatter points (ZGDPP, ZURBAN) in quadrant map.

### Critical parameters and principles

- i) A score, *F*, is computed as an indicator of a country's overall status as follows:

$$F(\text{ZGDPP}, \text{ZURBAN}) = \begin{cases} 1 & (\text{if } \text{ZGDPP} > 0 \text{ and } \text{ZURBAN} > 0) \\ 2 & (\text{if } \text{ZGDPP} < 0 \text{ and } \text{ZURBAN} > 0) \\ 3 & (\text{if } \text{ZGDPP} < 0 \text{ and } \text{ZURBAN} < 0) \\ 4 & (\text{if } \text{ZGDPP} > 0 \text{ and } \text{ZURBAN} < 0) \end{cases}$$

The overall state of a country's relationship between urbanization and economic develop can be divided into four types. First, coordinated with fast growth and fast urbanization (CFGFU) exists when the scatter of  $F(\text{ZGDPP}, \text{ZURBAN})$  is in the first quadrant, corresponding to the co-existence of a high level of economic development and a parallel high urbanization level. Second, over-urbanization exists when the scatter of  $F(\text{ZGDPP}, \text{ZURBAN})$  is in the second quadrant, denoting a low level of economic development, and a high level of urbanization; Third, Coordinated with slow growth and slow urbanization (CSGSU) exists when the scatter of  $F(\text{ZGDPP}, \text{ZURBAN})$  is in the third quadrant, corresponding to a combination of a low level of economic development and a lower urbanization level. Fourth, under-urbanization is said to exist when the scatter of  $F(\text{ZGDPP}, \text{ZURBAN})$  is in the fourth quadrant, combining a high level of economic development and a low degree of urbanization (Fig. 1). This method of identifying a country's urbanization path provides a simple initial approach but is insufficient. Every country's urbanization path is different for reasons that relate to the particular conditions that exist in that country, and so deviations from the average world path are to be expected. Small deviations should however be distinguished from large ones as in Fig. 1 where the shaded areas are ones, typed of coordinated with middle growth and middle urbanization (CMGMU), in which deviations are relatively small.

- ii)  $\Delta$  identification of the evolution of a country's URBANL or GDPPC

$$\Delta \text{ZURBANL} = (\text{ZURBANL}_2 - \text{ZURBANL}_1)$$

$$\begin{cases} > 0 & \text{faster than the average speed of the world} \\ = 0 & \text{synchronization of the average speed of the world} \\ < 0 & \text{slower than the average speed of the world} \end{cases}$$

By means of a simple difference in the level of urbanization at two points in time, we can identify the divergence of the speed of urbanization of any country and the world's average speed for that period.

- iii)  $K$  is an indicator of the relationship between the evolution of urbanization and economic development

$$K = (\text{ZURBANL}_t - \text{ZURBANL}_0) / (\text{ZGDPPC}_t - \text{ZGDPPC}_0)$$

With the help of the value of  $K$ , we can explore the direction and extent of deviations in the relationship of urbanization and economic development between any country and the world as a whole. Assuming that the difference indicators for ZURBANL and ZGDPPC are positive:  $K = 1$  shows that the relationship of urbanization and economic development is fully synchronized with the world pattern; when  $K > 1$ , indicates that the growth of urbanization is faster than the economic growth in a country compared to the world pattern, and the value of  $K$  indicates the magnitude of the difference in speed; while  $K < 1$  shows that the growth of urbanization is slower than economic growth relative to the world pattern, and the value of  $K$  indicates the extent to which it is slower.

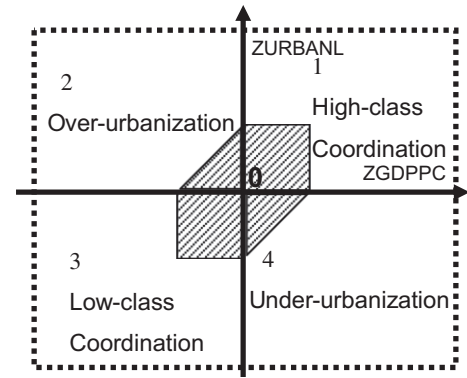


Fig. 1. Four-quadrants map of urbanization and economic development.

## The process and evolution of urbanization in china

### The urbanization level and urban population in China

To display some important characteristics of Chinese urbanization, the urbanization process is decomposed into three: the population (total and urban); urbanization (level and annual growth) and population change (annual growth rate of the total and urban population, annual change of the total and urban population). The overall patterns of Chinese urbanization and urban migration can be discerned from Table 1, which includes eight indicators for 5-year periods from 1960 to 1990 and annually for the period 1990–2010.

A number of points emerge from the data in this table. First, in spite of dramatic simultaneous increases in the size of the total population and urban population, the growth of China's total population and its urban population were running in different directions. The total population of China increased from 6620.7 million in 1960 to 13409.1 in 2010, an increase of 6788.4 million, or of 102.5%. At the same time the number of people residing in urban areas increased from 1307.3 million to 6697.8 million, an increase of 5390.5 million or of 412.3%. As stated above, over the past 50 years, China's total and urban population are increasing very quickly, creating the largest flow of migration in the history of the world. However, the annual size increase of the total population was gradually decreasing, while the growth of the urban population increased. These two opposite trends were a consequence of rapid economic development of China.

Second, it is clear that the urbanization level has increased from 19.8% in 1960 to 50.2% in 2010, whereas the proportion of the population that is rural has shown a gradual decrease over half a century. This trend reflects a gradual increasing trend of urbanization. China is in an acceleration stage of the process of urbanization in general. There are two salient turning points in the urbanization process. One occurred around 1980, prior to which China's pursued an anti-urbanization road. Anti-urbanization is a demographic and social process whereby people move from urban areas to rural areas. Recent research has documented the social and political drivers of China's distinctive anti-urbanization path. Since 1980, China has pursued a path of fast urbanization with a growth rate 0.53% per year. The second turning point was 1995, when the urbanization process further accelerated, increasing at about 1.4% per year.

Third, rural–urban migration gradually turns out to be the main source of Chinese urban population growth in 1960–2010 (Zhang & Song, 2003). China's annual urban growth can be divided into three parts: natural growth of urban population, stable rural to urban population–migration (for people possessing an urban *hukou*) and

**Table 1**  
The status of China's urbanization.

Year	Population		Urbanization		Population change			
	Total population (10,000)	Urban population (10,000)	Level (%)	Growth annually (%)	Total population growth rate annually (%)	Urban population growth rate annually (%)	Total population growth amount annually (10,000)	Urban population growth amount annually (10,000)
1960	66,207	13,073	19.8	—	—	—	—	—
1965	72,538	13,045	18.0	−0.35	1.84	−0.04	1266	−6
1970	82,992	14,424	17.4	−0.12	2.73	2.03	2091	276
1975	92,420	16,030	17.3	−0.01	2.18	2.13	1886	321
1980	98,705	19,140	19.4	0.41	1.32	3.61	1257	622
1985	105,851	25,094	23.7	0.86	1.41	5.57	1429	1191
1990	114,333	30,195	26.4	0.54	1.55	3.77	1696	1020
1991	115,823	31,203	26.9	0.53	1.30	3.34	1490	1008
1992	117,171	32,175	27.5	0.52	1.16	3.12	1348	972
1993	118,517	33,173	28.0	0.53	1.15	3.10	1346	998
1994	119,850	34,169	28.5	0.52	1.12	3.00	1333	996
1995	121,121	35,174	29.0	0.53	1.06	2.94	1271	1005
1996	122,389	37,304	30.5	1.44	1.05	6.06	1268	2130
1997	123,626	39,449	31.9	1.43	1.01	5.75	1237	2145
1998	124,761	41,608	33.4	1.44	0.92	5.47	1135	2159
1999	125,786	43,748	34.8	1.43	0.82	5.14	1025	2140
2000	126,743	45,906	36.2	1.44	0.76	4.93	957	2158
2001	127,627	48,064	37.7	1.44	0.70	4.70	884	2158
2002	128,453	50,212	39.1	1.43	0.65	4.47	826	2148
2003	129,227	52,376	40.5	1.44	0.60	4.31	774	2164
2004	129,988	54,283	41.8	1.23	0.59	3.64	761	1907
2005	130,756	56,212	43.0	1.23	0.59	3.55	768	1929
2006	131,448	58,288	44.3	1.35	0.53	3.69	692	2076
2007	132,129	60,633	45.9	1.55	0.52	4.02	681	2345
2008	132,802	62,403	47.0	1.10	0.51	2.92	673	1770
2009	133,450	64,512	48.3	1.35	0.49	3.38	648	2109
2010	134,091	66,978	50.0	1.61	0.48	3.82	641	2466

Source: These values were computed from the *China Statistical Yearbook 2011*.

unstable rural to urban population migration (involving a floating population with a rural *hukou*). Since 1980, the urban population annual growth rate stood at 3–5%, while the total population increase was only 0.5–1%. Obviously, a large part of urban population growth derives from rural–urban migration, and the size of the floating population with a rural *hukou* is growing rapidly, although there is no precise statistical data.

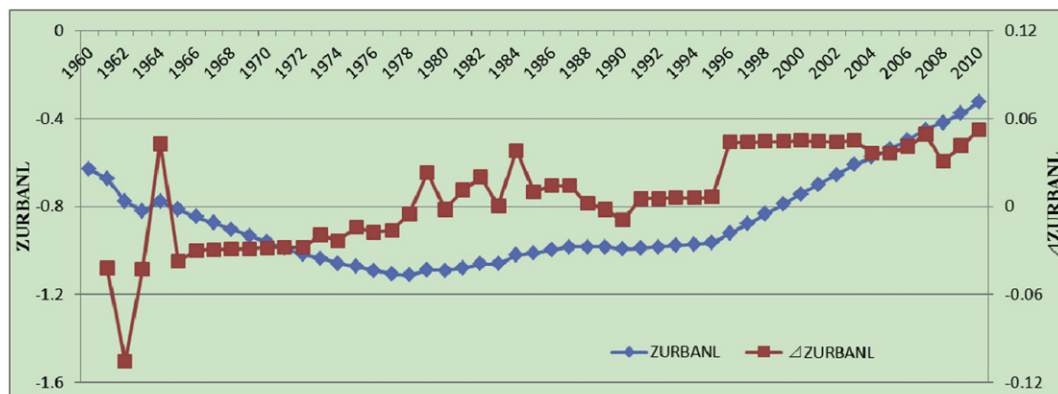
#### China's urbanization evolution in prospect of world's pattern

Based on the aforementioned methods and data, Fig. 2 shows the annual evolution of ZURBANL and  $\Delta$ ZURBANL in the period of 1960–2010. The main results are several folds.

The turning point in the evolution of  $\Delta$ ZURBANL was in 1979. From this point onwards, the value of  $\Delta$ ZURBANL remained negative until 1979, which indicated that China's urbanization level

continued to fall relative to the world as a whole, mainly because of the slower pace of urbanization compared with the other countries in sample. After 1979, the  $\Delta$ ZURBANL value exceeded zero, indicating relatively stronger urbanization in China compared with the rest of the sample. These results conform with the timing table of China's reform and opening-up.

China's urbanization has gone through three distinct phases: a rapid decline stage (1960–1978); a stable phase of ascension (1979–1995); and a phase of rapid promotion (1996–2010). In the first stage, it is clear that the relative position of China's urbanization level fell substantially, from −0.63 in 1960 to −1.11 in 1978, compared with the other countries in the sample. In the same period, China's urbanization level decreased from 19.7% to 17.9%, changing very slowly. The growth of the urbanization level of other countries was the main reason for the decline in China's relative position. In the second stage, stable growth of ZURBAN value from



**Fig. 2.** Evolution of ZURBANL and  $\Delta$ ZURBANL during the period of 1960–2010.



–1.09 in 1979 to –0.95 in 1995 shows that the urbanization process outpaced that in other countries during this period. China's urbanization level increased from just 19% in 1979 to 29% in 1995. In the third stage, the rapid linear growth of the annual ZURBANL value reveals that China's urbanization grew at faster pace from 1996 to 2010. The value of ZURBANL increased from –0.92 in 1996 to –0.33 in 2010, while the urbanization level also increased from 30.48% to 49.95%.

In order to avoid possible bias associated with the choice of sample, further steps were taken to verify the reliability of the above conclusions. The data for the world as a whole was divided into three groups. Type A represents all countries in the world, type B comprises China, and type C comprises all of the countries in the world excluding China. Comparisons of annual urban growth rates were made for each of the three periods (Fig. 3). The results show that the process of urbanization in China is unique, and in 1960–2010 can be divided into three stages. With the onset era of reform and opening-up since 1979, China's urbanization developed rapidly, and accelerated after 1995, contributing significantly to the world's urbanization process.

Generally, these observations can be used to identify the way China's urbanization has changed relative to the world as a whole, although confining analysis to time series data for an index of urbanization limits the scope of the conclusions.

#### *The evolution of China's urbanization and its relation to economic growth*

In this section we start from the assumption that urbanization and economic growth are closely related, and compare the relationship between these variables in China relative to the rest of the world and derive some conclusions regarding the reasonableness of China's urbanization path in 1960–2010.

Fig. 4a shows the overall evolution of China's urbanization and economic growth in 1960–2010, selecting data at an interval of five years. It is very clear that China's urbanization level and economic growth moved progressively in the opposite direction to the world pattern in 1960–1980. In contrast, its performance relative to the world increased rapidly in 1980–2010. Fig. 4b indicates in more detail the decline in the relative position both of China's urbanization and economic growth in the world during the period 1960–1970. Fig. 4c indicates that China's urbanization level and economic growth continued to move down and away from world averages in 1971–1980, but the decline was small compared with the previous 10 years. What is more, the value of ZURBANL and ZGDPPC rose slightly in 1979 and 1980. Fig. 4d shows that China reversed the tide in 1981–1990. The urbanization level and economic growth started

to increase gradually relative to the world pattern, but declined slightly in 1989 and 1990. The relationship between urbanization and economic growth differed significantly between the first 5 years and the second 5 years in 1991–2000. Both the urbanization level and economic growth in China steadily increased in the first 5 years, but the growth of urbanization level was very fast and coincided with slower global economic development in the second 5 years. A part of the explanation for these trends was the soft landing of China's economy and the Asian Financial Crisis of 1996. Most spectacular was the development miracle of China's rapidly growing economy and rising urbanization during the last decade (Fig. 4f).

The diagonal in Fig. 4 represents a set of dots, which indicates the relationship of urbanization and economic growth in the world as a whole. When a point lies on the upper left-hand side of the diagonal line, it indicates that relative level of urbanization is higher than the relative level of economic development, and that the speed of urbanization outpaces economic growth. On the contrary, urbanization lags behind economic growth when the dot lies on the lower right-hand side of the diagonal line. Therefore China's urbanization level lags behind its economic development level in 1960–2003, but from 2004 onwards, the relative level of urbanization gradually outpaced the relative level of economic development.

Calculations of the K value are reported in Table 2. At first economic development and the urbanization process was very slow, and the urbanization level decreased faster than economic growth in 1960–1980. In 1980–1990 China embarked on the middle stage of industrialization, after it started out on a programme of reform and opening up. In this period urbanization speed increased relative to the world as a whole, while after 1985 the effects of reform were reflected in faster relative growth. Between 1990 and 1995, urbanization, and economic growth achieved coordinated development (using the world average as a norm). In 1995–2010, accelerating urbanization outstripped relative economic growth.

#### **Assessments**

*China's economic development and urbanization relative to the world as a norm has greatly improved, approaching the world average levels, coordinated with middle growth and middle urbanization*

During 1960–2010, all values of ZGDPPC and ZURBANL are less than zero, and all of the points (Fig. 4) lie in the third quadrant. These values suggest that China's urbanization is associated with an average degree of coordination of urbanization and growth. It is safe to say, in fact, that over a long period China's urbanization and economic development were associated with a “double-low”: low scores on each indicator. In 2010, the value of ZURBANL and ZGDPPC is larger than –0.5, typed of coordinated with middle growth and middle urbanization, in which deviations are relatively small.

In Fig. 5 we graph China's urbanization level and the average for world using the urban population ratio. As can be seen, China embarked on rapid urbanization in the post-1978 period as a result of its reform and opening-up policy. China's urbanization gap compared to the world average level gradually declined and was eliminated in 2010. In Fig. 6, a comparison of China's GDP per capita and the average of world is depicted. Though the analysis of the absolute GDP per capita gap and relative GDP per capita gap between China and the world average from 1960 to 2010, we can see that relative GDP per capita gap decreased after 1990, although it has still not reached the world average.

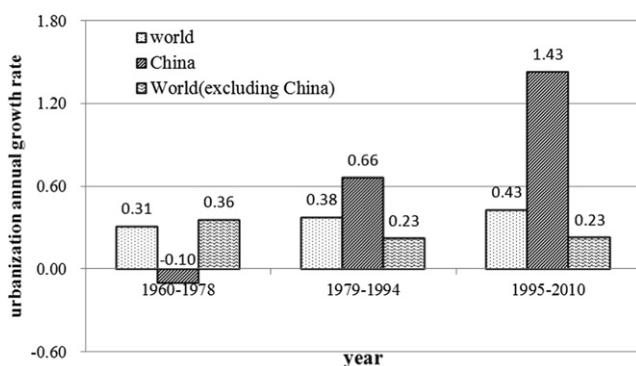


Fig. 3. Comparison of China's urbanization and the world in 1960–1978, 1979–1994 and 1995–2010.

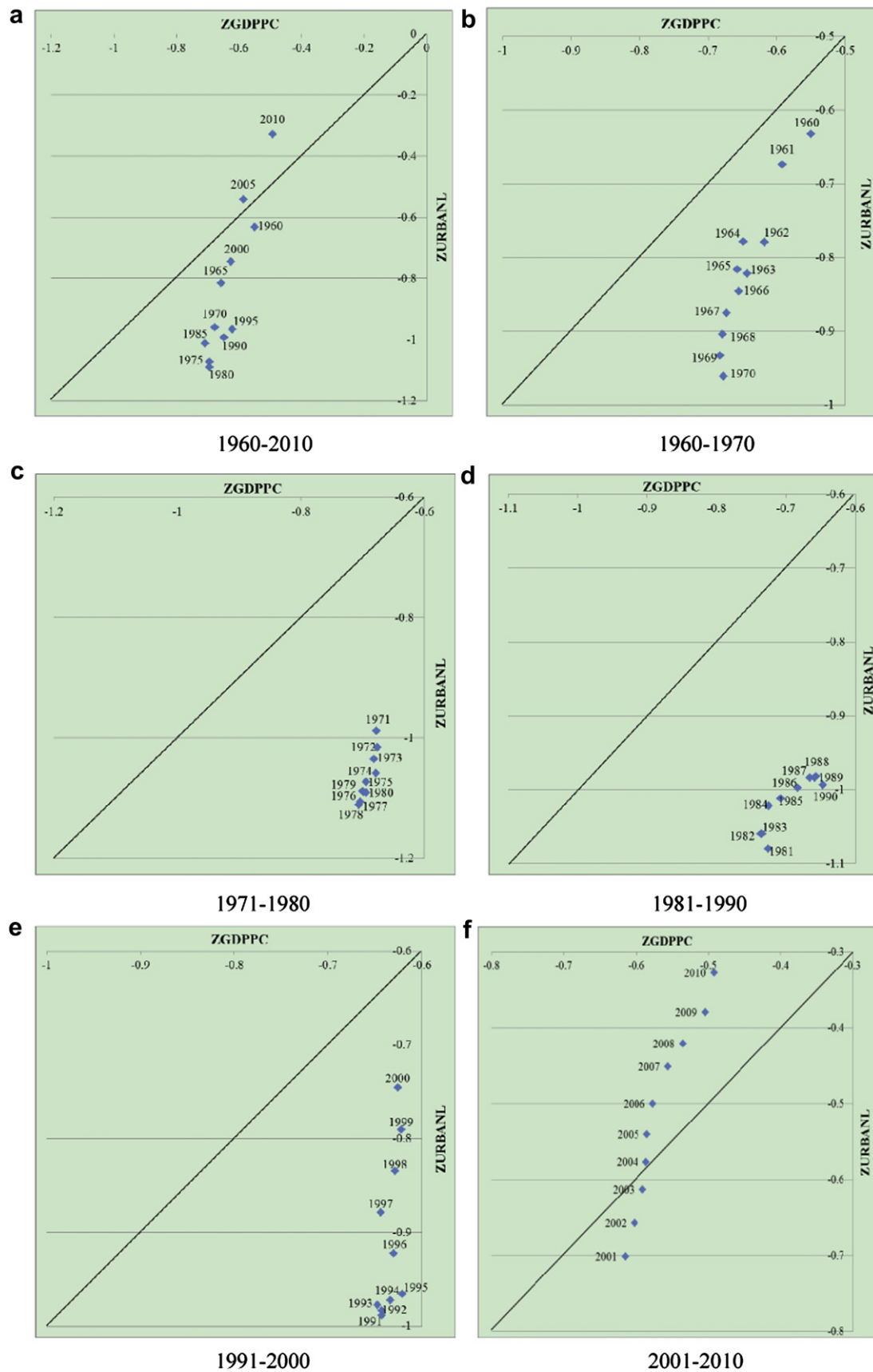


Fig. 4. China's urbanization and its relation to economic growth 1960–2010.

**Table 2**  
The change of K value during 1960–2010.

Year	K value	The relative position of China in the world and relationship		
		Urbanization level	Economic growth	Relationship
1960–1965	1.70	decreasing	decreasing	Under-urbanization
1965–1970	7.31	decreasing	decreasing	Under-urbanization
1970–1975	6.52	decreasing	decreasing	Under-urbanization
1975–1980	−33.22	decreasing	increasing	Under-urbanization
1980–1985	−5.82	increasing	decreasing	Urbanization outpaces economic growth
1985–1990	0.30	increasing	increasing	Under-urbanization
1990–1995	1.08	increasing	increasing	Coordinated development
1995–2000	−50.40	increasing	decreasing	Urbanization outpaces economic growth
2000–2005	5.04	increasing	increasing	Urbanization outpaces economic growth
2005–2010	2.30	increasing	increasing	Urbanization outpaces economic growth

*China's urbanization process has progressed faster than economic growth in recent years, and China's under-urbanization has changed gradually from 1978*

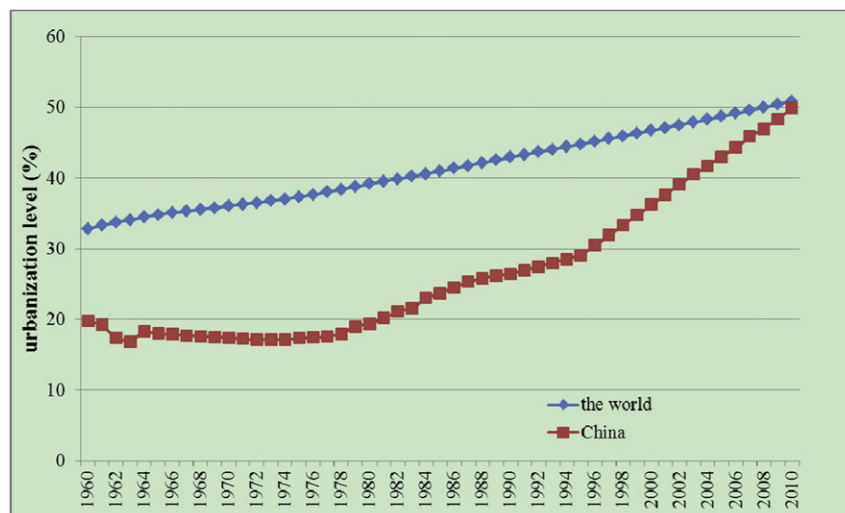
Since 1995, China's urbanization process has proceeded faster than economic growth; and China's under-urbanization early in reform and opening-up period has effectively been reversed. Prevalent views are closely associated with accelerating urbanization. Most scholars believe that China had been under-urbanized relative to countries at a comparable level of development (Chang & Brada, 2006). The continued increase in the share of the population living in urban areas in recent decades has been welcomed by many economists, who view urbanization as a positive achievement on the path toward wealth and prosperity. According to this view, urbanization underpins and enhances economic growth and therefore increases the wealth of nations in the long run. Governments have often undertaken active policies affecting the urbanization process (Bloom, Canning, & Fink, 2008).

Consequently, scholarly literatures on China's demographic development as well as the pronouncements of Chinese policy makers have hailed the country's growing urbanization levels as a sign of progress. Indeed, the acceleration of urbanization has become a central part of China's national development strategy in past decade (Chang & Brada, 2006). Many people have also proposed a speeding up the urbanization process; and policy-makers hope to increase economic growth by accelerating urbanization.

In 1995–2010, ZGDPPC values increasing from −0.62094 to −0.49219, ZURBANL values increased rapidly from −0.96588 to −0.32786, indicating that during that period China's economic level increased to a certain extent, while its degree of urbanization increased at an amazing rate. The year 2004 marked a turning point in the relationship between China's urbanization and economic development, in that the relative level of urbanization came to exceed the relative level of economic development.

*Rapid urbanization in China was achieved in a short-time, but there are risks that some relevant policies fall behind*

Although urbanization is of great importance as an indicator of the socio-economic development level of a country or region, rapid urbanization in China has generated severe challenges and some phenomena that are matters of concern. Firstly, accelerating the growth of urbanization has been put forward as a key strategy by many municipal governments. Although the urbanization of the population increases at a faster rate than is reasonable, the media have been pressing for a speeding-up of the growth rate, and some municipal governments pay too much attention to the quantity of urbanization relative to other regions, and too little attention to the quality of urbanization. Secondly, land urbanization develops much faster than population urbanization. The spatial expansion of cities in the form of new urban districts, development zones, government office areas and university towns has escaped control. In 1981, the size of urban built-up area in China was 7438 km<sup>2</sup>. In 2010 it reached 40,058 km<sup>2</sup>. Comprehensive urban land occupation per capita increased from 52 m<sup>2</sup> to 113 m<sup>2</sup>. George Lin argues that one of the main traits of Chinese urbanism is the fast growth of urban size and peri-urbanization. Thirdly, peri-urbanization predominates and the quality of urbanization remains low. On the basis of abundant informal employment and a low degree of spatial agglomeration of industries and population, it leads to the creation



**Fig. 5.** The evolution of China's urbanization and the world average in 1960–2010.

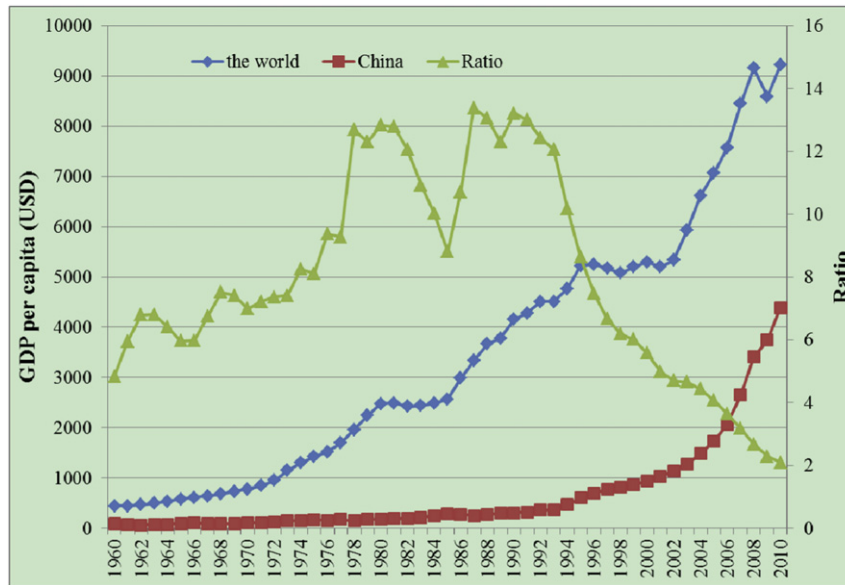


Fig. 6. The evolution of China's GDP per capita and the world average in 1960–2010.

of unique landscapes where there is no obvious distinction between the rural area and urban area. Fourthly, it is the population of migrant rural workers that grows steadily, yet these migrants do not have sufficient capacity to live in urban areas. Although migrant rural workers spend most of their time working in urban areas, urban public services, such as the employment service, education, social security, medical treatment and public health, originally provided for local citizens are not open to them. As a result many of their family members and offspring are stuck rural areas, although they should be regarded as urban citizens. Last, there are growing risks associated with resource-environment pressures and food security issues. Urban expansion has occupied seen the conversion to urban use of high quality arable land, and it is extremely difficult to compensate for the loss of valuable cropland.

In a few word, urbanization in China lacks a sufficient supporting system of industrialization. And yet it has already arrived at a situation where one-half of the population is urban. Compared with the fast growing urbanization, some policies fall behind. Examples are the household registration system and the income distribution system. Keeping abreast of rapid urbanization raises important challenges pertaining to the use of resources and the environment, the economic base of cities, social problems and infrastructure provision. Accelerating urbanization may cause even more troublesome problems.

## Conclusions

In relation to the controversial issue of the urbanization level in China, the FQM method was used to analyze quantitatively the evolution of the relationship between urbanization and economic development in China relative to the world as a whole using empirical data on levels of urbanization and economic development for 110 counties. The analysis led to a number of conclusions.

Urbanization has increased a great deal under the strategy of urbanization acceleration in recent years. Compared to other countries, the growth rate of the level of urbanization in China is much faster than that of economic development, and a state of relative under-urbanization had been improved.

The relationship between the levels of urbanization and economic development in China places it in a category of relatively moderate degree compared with the world pattern and using the average pattern in the world is a norm or standard for assessing

national pathways to development. As a result there is no need to be concern as to whether there is serious under-urbanization or over-urbanization. Every country has its own particularities. The global average provides a reference point against which national pathways can be compared. China today does not deviate far from the world average. What is must guard however against excessive urbanization and against excessive peri-urbanization. To achieve sustainable urban development in China, government and policy makers should give less emphasis to the quantity of growth and the growth rate in a context of fast growing urbanization, and should mainly focus upon the reform of relevant policies so as to keep abreast of growing urbanization, improving, for example, the income and income guarantee level for migrant rural workers, granting urban status to qualified rural workers and protecting the resource environment, especially high quality arable land.

## Acknowledgments

This work was supported jointly by the EU project URBACHINA (Grant No. FP7-266941), the National Natural Science Foundation of China (Grant No. 41001080) and Key Project for the Strategic Science Plan in IGSNRR, CAS (Grant No. 2012ZD006). The insightful and constructive comments of professor Mick Dunford (Sussex University and IGSNRR) and anonymous reviewers are appreciated.

## References

- Bloom, D. E., Canning, D., & Fink, G. (2008). Urbanization and the wealth of nations. *Science*, 319, 772–775.
- Chang, H. G., & Brada, J. C. (2006). The paradox of China's growing under-urbanization. *Economic Systems*, 30, 24–40.
- Chen, A., & Gao, J. (2011). Urbanization in China and the coordinated development model — the case of Chengdu. *Social Science Journal*, 48(3), 500–513.
- Cohen, B. (2006). Urbanization in developing countries: current trends, future projections, and key challenges for sustainability. *Technology in Society*, 28, 63–80.
- Friedmann, J. (2006). Four theses in the study of China's urbanization. *International Journal of Urban and Regional Research*, 30(2), 440–451.
- Henderson, J. V. (2002). Urbanization in developing countries. *World Bank Research Observer*, 17(1), 89–112.
- Henderson, J. V. (2003). The urbanization process and economic growth: the so what question. *Journal of Economic Growth*, 8(1), 47–71.
- Lin, G. C. S. (1998). China's industrialization with controlled urbanization: anti-urbanism or urban-biased? *Issues & Studies*, 34(6), 98–116.
- Lin, G. C. S. (2007). Chinese urbanism in question: state, society, and the reproduction of urban spaces. *Urban Geography*, 28, 7–29.



- Lu, D. D., Yao, S. M., Liu, H., Gao, X. L., Li, G. P., & Duan, J. J. (2007). *2006 report of China's regional development: Urbanization process and space sprawl*. The Commercial Press (In Chinese).
- Shen, J. (2005). Space, scale and the state: reorganizing urban space in China. In L. J. C. Ma, & F. Wu (Eds.), *Restructuring the Chinese city: Changing society, economy and space* (pp. 39–58). London and New York: Routledge.
- Shen, J., Zhiqiang, F., & Kwan-Yiu, W. (2006). Dual-track urbanization in a transitional economy: the case of Pearl River Delta in South China. *Habitat International*, 30, 690–705.
- Skeldon, R. (1999). Urbanization in large developing countries: China, Indonesia, Brazil, and India. *Urban Studies*, 36(3), 602–604.
- UNPD. (2010). *World urbanization prospects: The 2010 revision*. New York: United Nations.
- Zhang, L., & Zhao, S. X. (2003). Reinterpretation of China's under-urbanization: a systemic perspective. *Habitat International*, 27, 459–483.
- Zhang, K. H., & Song, S. (2003). Rural–urban migration and urbanization in China: evidence from time series and cross section analyses. *China Economic Review*, 4, 386–400.