Test of the Urbanization Lag of China and Its Cost in Employment*

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Abstract: Contrary to common belief, a reexamination of the urbanization status in China compared to the world standard reveals that the urbanization has actually further lagged behind during the recent twenty-year reform period. This urbanization lag implies a tremendous cost in employment, approximately a loss of 50 million job opportunities. Urgent attention and effective policies are needed to accelerate urbanization. (JEL classification: O18, O15)

I. Introduction

Urbanization accompanies economic growth during the development process. The causality may go in both directions. Economic growth promotes the expansion of modern industries and changes the structure of the economy; as a result, populations move out from the agriculture-dominated rural areas to the industry- and service-dominated urban areas (Todaro 1997). On the other hand, urbanization also promotes economic growth. Densely populated and business- and manufacturing-concentrated urban areas offer economies of scale and agglomeration economies by lowering transportation costs and promoting knowledge spillovers. Empirical tests have confirmed the strong correlation between urbanization and GDP per capita (Henderson 2000). The urban population as a percentage of the total population is 78 for high income OECD countries on average but is only 31 for low income countries (World Bank, 2001).

It is widely said that China's urbanization lags behind its overall development level. The major reason for this is that the existing strict *Hukou* (household registration) system imposed by the Chinese Communist Party government restricts free migration from rural to urban areas. The restriction on migration to the urban areas has been gradually relaxing since the reform started in 1978. As a result, 60 million rural workers are now working in the cities on a temporary basis; who are referred to as the "floating population". Paralleling to this change, the strict policy containing city size implemented in Mao's era has also been removed. As a result, urbanization accelerates. The percentage of the population living in urban areas increased from 17.4% in 1978 to 31.6% in 1999 (Table 1). Although the *Hukou* system is not as rigid as before, it remains in place even today and effectively restricts rural residents from moving to the city according to their will. Had the existing *Hukou* system been completely removed, we would have seen an even larger increases in the sizes of the urban population and urban areas in China today.

It is of both academic interest and practical need for policy options to examine how China's urbanization lags behind, and what the associated economics costs are. Various sources

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claim that China's urbanization is about ten percentage points behind other comparable countries, and that China has been catching up in this aspect during the past twenty year reform period (Li and Chen, 2001). Some claims that by now the Chinese urbanization lag is not statistically different from other comparable countries (ibid). In this paper I will use the most recent country data in the world to examine the urbanization lag in China. Although a simple regression basically confirms what is commonly claimed in the news media and academic articles, a better fitted log-income regression by using the large size data shows something quite different. In particular, it indicates that China's urbanization lag became even larger during the reform period. The gap is extremely statistically significant in recent years. These results contradict general belief. It calls for the urgent attention of economists and policy makers to this backwards sector in the Chinese economic growth.

In the following section, I will first present the data sources and empirical results, then offer some explanation for the puzzling results. In section III, I will discuss the implications of the results; in particular, the cost of this lag on employment and the associated economic loss. Section IV comprises my concluding remarks.

II. Model and Empirical Results

We first adopt a simple linear regression model to examine the relationship between urbanization and the development level. Urbanization is measured by the percentage of the total population living in urban areas, denoted by URBANPOP. Income is the GDP per capita at purchasing power parity (PPP), denoted by GDPpc, since PPP is a better measure than the exchange rate conversion. Hence we have the following regression model:

$$\text{URBANPOP} = \alpha_0 + \alpha_1 \text{ GDPpc} + \varepsilon$$

where α's are coefficients and ε is the error term with normal properties. The source of the data is World Development Indicator 2001. We first regress the model for countries other than China. This sample includes all countries for which data is available and with population greater than 20 million (except China) . The reason to eliminate the smaller countries is because some small countries are city states (such as Singapore) which constitute the outliers of the model, and, because many of the small countries do not have sensible data. These conditions result in a sample of 922 observations, quite large already. The estimated results are reported in Table 2. Both *t* ratios are extremely significant, indicating the strong correlation between urbanization and development. Next, we use this model with coefficient estimates to predict Chinese urbanization at various income levels and to compare the predicted urbanization level to the actual level. The deviation is reported in Column 4 of Table 1. It shows that, although China's urbanization falls behind other countries at the comparable income level within the range of 10 to 18 percentage points, since 1976 the lag has steadily fallen from 17.19 percent in 1976 to 10.33 percent in 1999.[1] These results are consistent with general belief.

The simple model, however, does not satisfactorily describe the relationship. Figure 1 plots the observations in a two-variable diagram. It can be seen that URBANPOP and GDPpc do not have a linear relationship. This suggests that we should replace income with log income, which is more commonly accepted in such a case. We then regress URBANPOP against the natural log of GDPpc. The results are also reported in Table 2. Both R square and adjusted R square are around 0.75, which are substantially greater than those of 0.52 from the simple linear model. Hence the log income model fits the relationship much better. Figure 2 plots the

[1] This means that the predicted URBANPOP for 1976 is 35.03 percent and for 1999 is 41.95 percent.

relationship with log income on the horizontal axis. It can be seen that URBANPOP and log GDPpc form a thick linear relationship. The *t* ratios for the coefficients are also significantly greater than those from the simple linear model, as expected.

We use the estimated log linear model to calculate the deviation of Chinese urbanization from that of the other countries in the world. The results are reported in column 5 of Table 1. These results draw a quite different picture about the Chinese urbanization status since 1978. In particular, it contradicts popular belief. Surprisingly, it showed that in 1976, the beginning year of the reform period, China's urbanization was not behind other countries at the same income level. On the contrary, there were more urban residents in China (by more than three percentage of the total population) than other comparable countries at the same income level. At first glance, this seems to be unlikely. During the 1949-1976 period of Mao's era, migration to cities was strictly prohibited. Further, many urban residents were sent to the countryside during the Great Leap famine years and the Cultural Revolution. These policies should have resulted in a smaller urban population at the end of this period. Then how can we explain this paradox? A further examination of the data reveals what happened during the period. The GDP per capita in 1976 in China was 683 U.S. dollars (measured by PPP at the base year of 1996). This income level was in par with only the poorest countries in the world, such as that of Ethiopia in 1987 (628 dollars), Nigeria in 1986 (682 dollars), Uganda in 1985 (732 dollars). In other words, the economic disasters during Mao's era had destroyed the income level much more than the urbanization level. The economic disasters after the Great Leap Forward and the Cultural Revolution had set the nation's average output all the way back to the rank among the poorest in the world, and to be even poorer than the pre-revolution period. (Many calculation indicated that the GDP per capita in 1976 in China was lower than that in 1936).[2] These bad policies also impede urbanization, but not as severe. Thus the urbanization lag had been reversed in 1976, by moving in a backward direction during 1949-76.

In addition, the party's general policy was biased towards urban areas during Mao's era, the cities in fact suffered much less than the countryside from the economic and political catastrophes. The Great Leap Famine in 1958-61 took a toll of 20 million excess deaths in the countryside, but few excess deaths occurred in urban areas (Chang and Wen, 1997). During the famine period and the Cultural Revolution, though many urban residents were sent to the rural areas, this reverse migration apparently was dominated by the famine deaths in rural areas and the adverse change in the income level. All these factors explain why the urbanization in 1976, at the start of the reform, appeared to be lead ahead by at the income level, by using the world standard.

Even more surprisingly, the study found that the urbanization lag has grown steadily since the reform started in 1976, as shown in the Column 5. By 1999, URBANPOP is almost 15 percentage points below the world standard. The income level for China in 1999 was in par with those in Malaysia in 1977, Morocco in 1996, Ukraine in 1996, and Philippines in 1986. Yet about 40 to 68 percent of the populations in these countries were urban residents, but only 32 percent of the Chinese population were. In addition, it can be seen from Column (6) that the differences are extremely statistically significant.
\footnote{Li and Chen (2001) found the Chinese urbanization lag in 1999 is not statistically different form other comparable countries.}
The main explanation for this trend of growing lag is that the Chinese GDP growth was outpacing urbanization. A major reason for the urbanization lag is that the *Hukou* system remains effective. Hence, as compared with the countries at this level, China lags behind in urbanization.

[2] See Duan Jiwen, "The Comparison of GDP Levels Between The Pre- and Post- Revolution Periods," *Zhengmin*, 1990, Hong Kong.

III. Cost of the Urbanization Lag

Our work confirms that urbanization in China still lags behind the world standard even after twenty years of rapid growth in China. What is more surprising still is that the lag has increased during reform and that the trend is continuing. During the past two decades, about 60 million of the rural population has already moved to the cities. The new census conducted in 2000 shows that after including those who have stayed in the same cities for more than six months, the urban population accounts for about 36 percent of the national total. Even using this new figure would not change our conclusion. One can still infer from Table 1 that China is at least 10 percentage points below other comparable countries in urbanization.

What factors caused this urbanization lag? The major factor is the *Hukou* system. Although the system has become much less rigid since the reform started, it has not been completely removed. Migrants from rural areas are still subject to various discriminatory treatments in cities in terms of job offers, schooling, health care, housing, etc. Local city administrations often set many other barriers to restrict migrants, in addition to the *Hukou* system. Some examples are police harassment and mandatory deportation of new migrants who have not yet found jobs. All of these policies impede migration and thus healthy urbanization.

However, many Chinese scholars still consider these restrictions necessary.[3] Their arguments are in line with traditional criticism over problems associated with oversized cities in developing countries, which include urban slums, congestion, health hazards, crime, etc. Above all, the greatest concern of the most critics is that free migration will make the already serious urban unemployment rates even worse.

A close examination would find that many of these arguments can be fallacious. The objection to rural migrants because of urban unemployment concerns is similar to the case against Mexican immigrants in the U.S. Migrants may compete with urban residents in the unskilled labor market in cities, but only to a very limited extent. Migrants often take the jobs with bad working conditions (such as construction) and very low pay (such as recycling garbage) in which employers cannot find enough urban residents who are willing to do the work. Rural migrants can also be complementary to urban workers in developing business and creating more jobs, especially in those areas where rural migrants' physical strength is combined with urban workers' experience and skill. Even if we assume that competition between migrant workers and urban unskilled workers dominates their complementariness, we can still prove that this migration will make a country as a whole better off in terms of jobs created.

The insight of this proof is as follows: China has a surplus labor force of 120 million in rural areas. Their marginal product is zero or very close to zero. These 120 million surplus laborers are by nature unemployed. The only trick is that this figure is not classified in official statistics as being unemployed. Suppose 40 million of them move to the cities and take over the jobs from urban residents. While urban residents would have lost these jobs to the migrants, the total job positions in the economy do not decrease. However, as the migration will also create new jobs, such as the jobs created by using the complementariness we mentioned above, the migration results in a net gain in employment for the nation as a whole.

In fact, the main gain in job creation by urbanization (e.g., the above hypothetical case of 40 million migrants to the cities) takes place in the consequent expansion of the service

[3] For instance, see Zhen Pingshi, 2001.

sector. The rural economy is often self-reliant as rural residents purchase little services from the market. Yet, the urban life style and economic structure is much more market oriented. Urban residents' demand for services such as for transportation and retail services, is substantially greater. Hence, urbanization will stimulate the expansion and employment of the service sector. According to the estimation by Chang (2000), if the urbanization level increases by one percentage point, it will raise 0.72 percentage points of employment in the non-agriculture sectors in China. This is equivalent to 4.9 million new jobs. Hence, 10 percentage points of urbanization lag implies a loss of 49 million job opportunities for China. This is a huge economic cost for the Chinese economy due to the urbanization lag, which should dominate any other perceivable benefits from the restriction of migration or urbanization.

Because of the restriction on free migration, a tourist to Chinese cities may have the impression that Chinese cities look better than cities in other comparable developing countries. There are few beggars, streets are relatively clean, and slum areas are not extensive. His impression may further be cited by both domestic and foreign scholars to support the restriction policy on urban growth and migration. As I argued, however, the cost of this gain in appearance is the substantial loss of income in the countryside. A policy to eliminating a street beggar may cause dozens of more living under the poverty line in rural areas. Such a policy may not be economic efficient for a country as a whole. In 1998, the income per capita in urban areas was 5425 yuans while in rural areas was only 2162 yuans. The ratio of income and consumption for urban to rural residents in China were 2.1:1 and 3.3:1 respectively. Other countries normally have these ratios under 1.6. The income gap between urban and rural areas in China is now among the largest in the world.[4] Consequently, we can infer that, given the same nationwide average GDP per capita level, Chinese peasants are living in a poorer condition than their counterparts in other countries because the income gap is larger. The Todaro model implies that the expected incomes of urban and rural residents would converge under free migration. Had free migration been allowed in China, the urban-rural income gap would be smaller and the average rural income would be higher even at the same average national income level.

IV. Concluding Remarks

Contrary to common belief, my reexamination of the urbanization status in China by the world standard reveals that urbanization has further lagged behind economic growth during the recent twenty-year reform period. This lag implies a tremendous cost in employment: An equivalent of a loss of about 50 million potential jobs. Although the urbanization lag in China has not gone unnoticed, I believe its severity and the urgency to eliminating the lag have not been fully recognized so far. Proper policies to accelerate urbanization in China will be a critical strategy in near future to create more jobs, reduce income gaps, and sustain economic growth. I hope the conclusion from this study will attract urgent attention to the problem and produce more effective policies to deal with the problem.

[4] According to DGale Johnson, based on the data from International Labor Organization. See Johnson (2001).

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Table 1: The Status of Chinese Urbanization

Year	Urban Residents As % of Total Population (1)	GDP Per Capita (1996 PPP$) measured by income level (2)	GDP Per Capita (1996 PPP$) measured by log income level (3)	Estimated Urbanization Lag of China by income level (4)	Estimated Urbanization Lag of China by log income level (5)	p-value of lag (5) (6)
1975	17.4%	683.013	6.52651	-17.75%	1.74%	0.024342
1976	17.84%	632.908	6.45032	-17.19%	3.63%	0.000006
1977	18.28%	639.183	6.46019	-16.76%	3.88%	0.000001
1978	18.72%	699.274	6.55004	-16.47%	2.61%	0.000662
1979	19.16%	766.756	6.64217	-16.20%	1.30%	0.078092
1980	19.6%	815.217	6.70345	-15.88%	0.57%	0.425480
1981	20.28%	819.817	6.70908	-15.21%	1.15%	0.110252
1982	20.96%	841.751	6.73548	-14.58%	1.32%	0.062274
1983	21.64%	884.146	6.78462	-14.01%	1.07%	0.124480
1984	22.32%	1009.08	6.9168	-13.63%	-0.77%	0.240360
1985	23%	1138.85	7.03778	-13.27%	-2.39%	0.000123
1986	23.88%	1284.45	7.15809	-12.75%	-3.80%	0.000000
1987	24.76%	1483.09	7.30188	-12.35%	-5.66%	0.000000
1988	25.64%	1657.51	7.41307	-11.90%	-6.90%	0.000000
1989	26.52%	1633.78	7.39865	-10.96%	-5.75%	0.000000
1990	27.4%	1618.86	7.38948	-10.05%	-4.69%	0.000000
1991	27.86%	1716.77	7.4482	-9.83%	-5.35%	0.000000
1992	28.32%	1969.2	7.58538	-9.99%	-7.50%	0.000000
1993	28.78%	2204.18	7.69811	-10.10%	-9.19%	0.000000
1994	29.24%	2445.21	7.80189	-10.23%	-10.70%	0.000000
1995	29.7%	2733.32	7.91327	-10.48%	-12.36%	0.000000
1996	30.18%	2940.46	7.98632	-10.51%	-13.28%	0.000000
1997	30.66%	3094.11	8.03726	-10.41%	-13.77%	0.000000
1998	31.14%	3237.8	8.08265	-10.28%	-14.15%	0.000000
1999	31.62%	3452.79	8.14694	-10.33%	-14.89%	0.000000

Source of data：World Bank, World Development Indicator, 2001, CD-Rom version".

Table 2: Regression Results

Dependent variable: Percentage of Population in Urban Areas (URBANPOP)
Observations: 922

	Model 1	Model 2
Intercept	33.4766	-108.62
(t ratio)	(43.15)	(-36.01)
GDP per capita	0.00245	
(t ratio)	(32.11)	
ln (GDP per capita)		19.0419
(t ratio)		(53.55)
R square	0.528	0.757
Adjusted R square	0.528	0.757
Standard error	16.1105	11.5622

Figure 1: Urbanization and Income

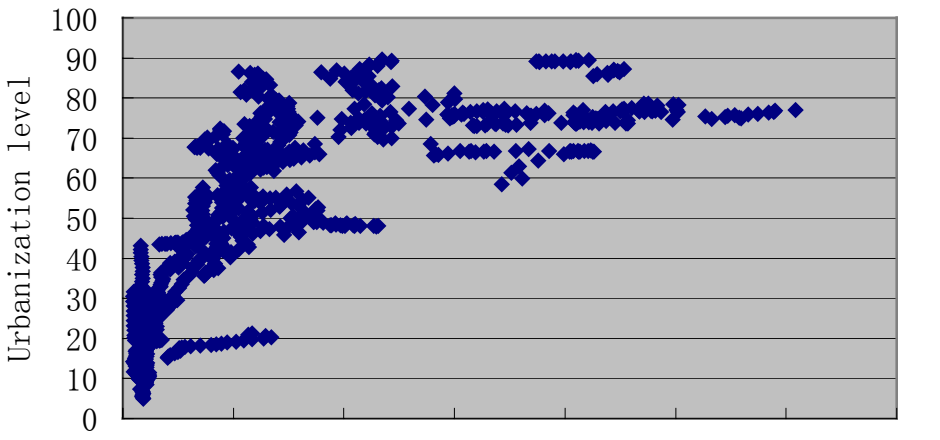

Figure 2: Urbanization and Income