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# **Rural-Urban Income Disparity and WTO Impact on China's Agricultural Sector: Policy Considerations**

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## **Rural-Urban Income Disparity and WTO Impact on China's Agricultural Sector: Policy Considerations**

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Since the beginning of agricultural reform in the late 1970s and early 1980s, grain output in China has increased significantly. The long-standing problem of grain supply shortages has basically been solved. However, grain production and pricing is still not fully liberalized and large fluctuations in grain prices, together with short-term shortages and surpluses of grain, have occurred several times. These events have seriously affected farmers' incomes. Partially as a result, rural-urban income disparities have grown, particularly in the 1990s.

In 2001, China entered the World Trade Organization. Because of the commitment made to open the domestic market for agricultural products, grain imports are increasing rapidly. Domestic grain production and farmers' incomes are facing new challenges. This paper examines recent developments in rural-urban income differentials, especially in the light of the WTO commitments, the appropriateness of related domestic policies such as grain pricing and urbanisation policies, and the effects of adjustments of these policies in response to the new challenges.

In Section 1, we review agricultural production and rural-urban income differences in China. Section 2 provides a brief outline of the likely impact of China's WTO accession on the farming sector and rural incomes. In Section 3 we discuss the impact of policy inconsistency between the market opening and domestic trade policy.

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In Section 4 we offer recommendations for further reform of the domestic grain trade system. Section 5 examines the potential contribution of rural industrialisation and urbanisation to rural incomes and considers policies for acceleration of urbanisation in response to the situation of more open agricultural markets.

## 1. Agriculture and rural-urban income disparity in China

After half a century of rapid industrialisation, the dominant role of China's agricultural sector (including farming, forestry, animal husbandry and fishery) in the economy has been replaced by the industry and service sectors. In spite of significant growth in agricultural production, the share of the agricultural sector in GDP declined from 51 percent to only 15 percent from 1952 to 2001. However, because of the large size and continued growth of the rural population, the employment structure of the agricultural and non-agricultural sectors changed far more slowly than the change in the output structure. Agricultural employment accounted for 84 percent of total employment in 1952, and declined to 50 percent in 2001. At the same time, agricultural employment increased from 173 million to 365 million.<sup>1</sup>

The share of the rural population changed even more slowly. The rural population still accounts for 62 percent of China's total population, as compared to 85 percent in 1953 (see Table 1).

Table 1: The importance of the agricultural and rural sectors in China

		1952	2001		1952	2001
Agricultural value-added	Bil. Yuan	34	1461	% of GDP	51	15
Agr. worker	mil. Persons	173	365	% of total employment	84	50
Rural population	mil. Persons	505*	796	% of total population	85	62

\* 1953 data.

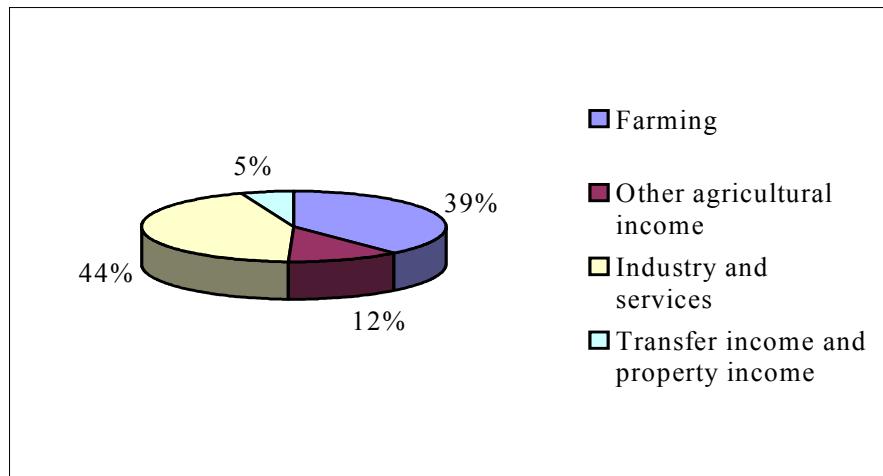
Source: Calculated from National Bureau of Statistics (2002, 1999b).

Farming remains the most important component of Chinese agriculture; although reduced, it still accounted for 55% of the gross value of agricultural output in year

<sup>1</sup> Data used in this paper without acknowledgement are all from the National Bureau of Statistics.

2001. Surveys show that, in year 2000, 51% of rural household income came from the agricultural sector as a whole and 39% from farming (Figure 1). Grain production has been the major farming activity, especially in less developed regions.

Figure 1: The structure of rural household income in year 2000



Source: NBS (2001).

Movement of the agricultural population to non-agricultural sectors was hampered by the restrictive central policies during the pre-reform period from the 1950s to the late 1970s. Rural industrialisation and urbanisation has been speeded up since the market reforms. Such developments have provided close to 200 million additional non-agricultural jobs to farmers in rural and urban areas over the past 24 years. Still, the number of farmers has increased and there appears to be more surplus agricultural labour than ever before. Rural income grew slowly, and differences between rural and urban incomes became larger.

Table 2 shows changes in income per capita in rural and urban areas of China and its three major regions from 1980 to 2000. It shows that rural income per capita in rural areas was 47 percent of urban income in 1980; this ratio had declined to 35 percent by 2000. Rural-urban income disparity increased in all three regions, but more seriously in the least-developed West region where the rural-urban income ratio fell from 45 to 30 percent during the same period. In year 2000, the average annual rural

income per capita in the West region was 1713 Chinese Yuan (or US\$ 207), only half of the average rural income in the East Region.

Table 2: Rural-urban income disparity, 1980 and 2000 (Chinese Yuan in current prices)

	1980			2000		
	Urban	Rural	Rural/urban	Urban	Rural	Rural/urban
East	452	246	54.4%	7940	3429	43.2%
Central	386	191	49.5%	5217	2091	40.1%
West	383	172	44.9%	5642	1713	30.4%
China	413	193	46.7%	6635	2301	34.7%

Note: incomes are calculated by the authors as weighted averages from urban disposable income and rural pure income at the provincial level.

Source: NBS (2000a, 2001).

## 2. The impact of WTO accession on agriculture and rural incomes

In 2001, China entered the World Trade Organization and committed to open its domestic food markets to imports to a much larger extent. There have been several immediate changes in agricultural product trade policies following China's WTO accession. The most important ones can be summarised as follows:

- a). China accepted a tariff rate quota (TRQ) for major grain imports (wheat, corn and rice) at a token tariff rate of 1%. The quota is 18.31 million tons for 2002, 20.2 million tons for 2003, and 22.16 million tons for 2004 (WTO, 2001). The quota is shared between the state and private trading enterprises, and all unused state quotas are to be transferred to private enterprises.
- b). The above-quota tariff rate for the major grains is 65%.<sup>2</sup> There is no import quota for soybeans. The tariff rate for soybeans is 3%.
- c). The average tariff rate for all agricultural products is to be reduced from 22% to 17.5%.
- d). All export subsidies are to be eliminated.
- e). Other non-tariff restrictions on imports of agricultural products, such as licensing, are to be eliminated. This includes restrictions on imports of wheat from the

<sup>2</sup> However, this tariff rate is unlikely to be used in normal cases since the quota is large compared with the historical record of grain imports.

northwest areas of North America which may have TCK disease.

The import quota of 22 million tons is large compared with the historical level of imports. During the 1990s, the average annual imports of grain were 9.0 million tons, and there were net export of 0.8 million tons annually. There was only one year, 1995, when grain imports exceeded 20 million tons, and this resulted in a serious surplus of grain on the domestic market. The 2004 import quota is equal to 5.5% of the total output in year 2000, a not very large proportion; however, the size of the domestic grain market is far smaller than total output, because half of the grain output is consumed by farmers and does not enter the market. Calculations show that the 2004 TRQ accounts for 11.9% of the domestic grain market. It is estimated that full utilisation of TRQ in the short run, without major structural adjustment, could mean the loss of 9 million farming jobs (Wang, 2002).

China does not have a comparative advantage in the production of major grains such as wheat, corn and soybeans. A comparison shows that the average prices of these three products in rural markets in the period between 1995 and 2000 were 7%, 30% and 31% higher than their 2000 CIF prices, respectively. It is not surprising, therefore, that imports of soybeans and soybean oil are increasing rapidly. The domestic price of rice is lower than CIF prices, although its average quality is also lower than that of imports. Thus, in the face of increasing imports, domestic production of these grains will reduce significantly.

In 2000 and 2001, cereal imports were at moderate levels of 3.15 and 3.44 million tons, respectively. Due to surpluses and the low prices of grain in the domestic market,<sup>4</sup> as a result of the over-supply since 1998, it is unlikely that the TRQ will be fully used in the near future. However, the TRQ is preventing domestic grain prices from recovering to their recent levels. Meanwhile, soybean imports rose to the historically high level of 13.9 million tons in 2001, nearly as much as the domestic

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<sup>4</sup> In real terms, the compound market price of major grains, i.e., rice, wheat, corn and soybean, in 2000 was only 57% of the 1995 level and 78% of the 1997 level (calculations by the authors). Data are from the Ministry of Agriculture (various years), Information Center of MOA, Wu (2001), and NBS (various years).

output (NBS, 2002). This has led to a large surplus in the soybean market.

It is clear that without major adjustments in the production structure, the growing grain imports will significantly affect farmers' incomes and further widen the rural-urban income gap.

However, the WTO accession provides great possibilities for reforming China's agricultural sector, leading to positive long-run effects on farmers' incomes, as it pushes agriculture towards its comparative advantages and higher efficiencies. In 2002, the area sown to grain in China fell by 2%, whereas the total grain output increased by 1% from the previous year. New breeds of soybean with significantly higher quality and higher oil content were introduced to Northeast China, the main region of soybean production (CCTV 08/01/2003). These are signs indicating that further increases in efficiency in agricultural production are possible in response to the WTO challenge.

However, to significantly increase agricultural efficiency and reduce rural-urban income disparities, not only structural adjustments of agricultural production but also broad changes in China's domestic grain trade policy are needed.

### **3. The grain pricing system in China and its inconsistencies with WTO accession**

The current domestic grain trade policy—which provides grain support prices to farmers and monopolises the domestic grain trade system (although, not fully)—is not only inconsistent with the trade liberalisation but is hardly helpful to farmers.

Agricultural production and domestic trade of agricultural products was partially liberalised in the late 1970s and early 1980s. These reforms changed the long-term situation of grain supply shortages into surpluses. Grain output increased from 283 million tons to 407 million tons during the 1978-84 period. Grain production was first stimulated by the rise in state purchasing prices, and subsequently fueled by the abolition of the People's Commune System and introduction of the Household Responsibility System, which converted the collective-based production system into a private system. Grain production was affected by three prices at that time—the state quota price, the above-quota price, and the market price—but none of them was

linked to world market prices.

In nominal terms, quota prices rose slightly in the 1980s at a time of high inflation. From 1985 to 1990, the real price of the major grains (as a weighted average of the prices of rice, wheat and corn) fell by 22%. Market prices played a role at the margin, whereas government prices had a larger impact on grain production because the volume of state purchases was so large (Wang, 2001). As the result of low government prices, grain output remained at the 400 million tons level in the middle and late 1980s, while demand for grain increased significantly. The above-quota prices have converged to a level close to market prices since the early 1990s and fluctuated in line with market prices because of less government intervention. This seems to be the main reason for grain production reaching 440 million tons in the early and middle 1990s.

Stimulated by the improvement in grain supply, the government decided to liberalise the quota control system in 1993. However, most of the state-owned grain dealers have become partially profit-oriented and expected to make profits from holding grain stocks. This resulted in supply shortages and sudden increases in market prices in the short run, which led farmers to hold their products for expected higher prices. Facing sharp increases in market prices and shortages, the government decided to give up the planned reform and, instead, to increase the quota prices substantially in 1994. Quota prices were further increased in 1995-97 to encourage grain production. In 1997, the level of quota prices in real terms (as a weighted average of the prices of rice, wheat and corn) was 51% higher than in 1993 and 20% higher than in 1985 (data are from the Ministry of Agriculture, various years). Domestic prices of several grain products significantly exceeded the world market prices. At the same time, the central government introduced a “provincial governor responsibility system” to insure local self-sufficiency of grain supplies.

Responding to the higher prices, the area sown to grain increased by 4% and grain yield per hectare increased by 10% between 1994 and 1998. Total grain output reached 504 million tons in 1996 and 512 million tons in 1998. This output far exceeded domestic demand and resulted in decreases in market prices since 1997.

From 1996 to 2000, market prices of rice, wheat, corn and soybean dropped by 39%, 35%, 44% and 44%, respectively (calculated by the authors, data are from the Information Center, the Ministry of Agriculture). A model simulation shows that the rigid government pricing system has caused serious price and output instability in grain markets (Wang, 2001).

The rigidity of the state-monopolised grain trade system and mistakes of the grain trading companies added fuel to the flames of supply surpluses. While domestic supply was increasing, there were net imports of 18.67 and 10.25 million tons of grain in 1995 and 1996, respectively, which worsened the situation of domestic grain surpluses.

Faced with the low market prices, the government announced three policies in 1998: 1) all grain products should be purchased by the state grain companies at support prices that are higher than market prices; 2) the state grain companies have to sell grain at prices not lower than the support prices, so that the state subsidy can be reduced; and 3) bank loans extended to these companies for the purpose of grain purchases are not allowed to be used for other purposes. In addition, in order to make the support prices work, the grain market was monopolised by the state, and private businesses were prohibited from purchasing grain directly from farmers.

These policies did not achieve the goal of protecting farmers' incomes for several reasons. First, after two decades of market-oriented reform, it is extremely difficult to entirely monopolise grain purchases. Second, the role of policy executants that was given to the state grain companies conflicted with their role as profit makers. To make profits or to avoid losses, they tended to under-grade the quality of grain they were purchasing from farmers, or make extra deductions for 'wet' and 'impure' grain, so that they could pay no more than market prices. In some cases, they refused to purchase from farmers, only from private dealers, so that under-the-table deals could be made to share the price margin. Third, even if consumer prices could be monopolised at a higher level than would clear the market, the demand for grain is not under state control. As the result, the over-supplied grain could not be sold off and the losses have to be borne by either the state or farmers. In addition, while farmers

benefit little from the support prices, the state has to bear the huge cost of storing a large amount of grain and to invest in many new storehouses.

Under these pressures, a few changes have been made to partially liberalise the grain markets. First, some low quality grains were excluded from the support list in 2001. Second, up to 2002, the local grain market has been liberalised in eight east coast provinces that have a grain trade deficit. Third, decision-making on support prices has been transferred from the central to the provincial governments, and this has resulted in support prices moving closer to market prices.

In spite of these changes, the support price system still conflicts with the market mechanism, and generates more conflict following the WTO accession, because it encourages domestic production of grain which does not have a comparative advantage, and therefore results in surpluses and lower market prices. Further liberalisation of the grain market is needed.

#### **4. Policy considerations in liberalising the grain market**

There are several fears about liberalisation of the grain market:

1. Without government protection, farmers may be hurt when the market price of grain is low;
2. Without the government purchase and supply of grain, food security may not be assured when there are poor harvests or war threats;
3. Liberalisation of the grain market and withdrawal of government subsidies will result in job losses in the state grain trade sector of up to two million; and
4. The accumulation of huge financial losses and non-performing loans in the state grain sector is a hot political potato; once the market is liberalised, the non-performing loans in the state sector have to be liquidated immediately.

Contrary to these opinions, past experience shows that government intervention has resulted in instability of grain supply, larger price fluctuations, inefficient operations, and huge losses in the state grain trade sector. The earlier the state grain trade sector is reformed, the more quickly the losses can be avoided.

In those provinces in which the grain market has been liberalised, the situation is

satisfactory: i.e., price levels, demand and supply are basically stable; the formal state grain companies have been either privatised or restructured; and at least some of these businesses have become profitable.

Liberalisation of the grain market will have at least the following benefits:

First, the grain surplus will soon be absorbed, which will help to stabilise market prices. Second, market prices formed on the basis of demand and supply will give farmers the best available information on which to base their production decisions. Other agricultural products in which China has comparative advantage, e.g., some vegetables, fruits, animal products, and herbal medicines, will replace grains, and this will help to increase farmers' incomes. Third, the accumulated huge losses and non-performing loans in the state grain sector have become a heavy burden on the economy. This burden will be soon removed after liberalisation of the grain market.

However, as well as deregulation, the government needs to be pro-active in certain areas:

1. Anti-monopoly regulations should be enacted and a market supervision system established to reduce the likelihood of monopolistic practices, whether by government or private traders.
2. Due to difficulties in farmers gaining access to market information, the government should accept responsibility for establishing a broad network of information services to provide farmers with supply and demand information and forecasts of the domestic and international food markets.
3. In some areas, the agricultural technology support and training systems run by government have played an excellent role in helping farmers to adopt new technology. However, there are still many farmers, particularly in remote areas, who do not enjoy these services. These systems should be expanded. New products, breeds, fertilizers, and other technologies and production methods should be more widely and more quickly introduced and demonstrated to farmers.
4. For emergency food supply situations, an effective nation-wide grain reserve system is needed. However, its sole function should be as emergency food supplies. Non-government stocks should be allowed to perform that role. The current grain

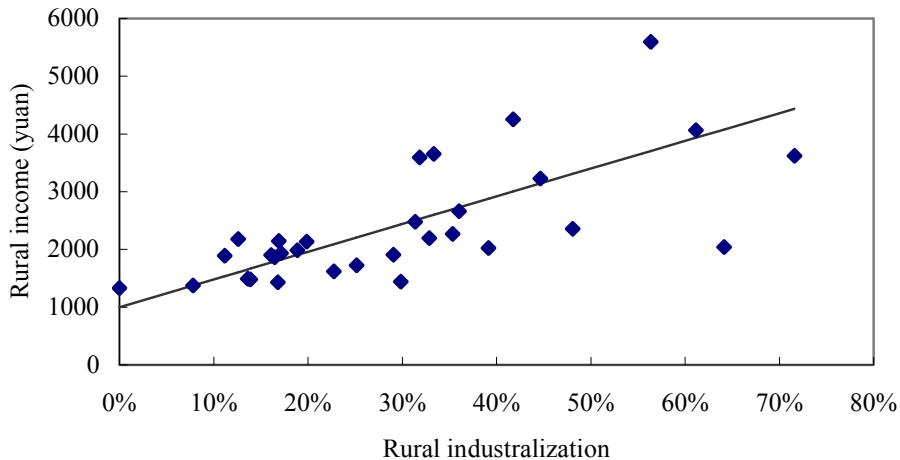
reserve system is too large and too complicated and inefficient, run as it is by different government agencies at the central, provincial, and municipal levels. Because of the different interests of the various agencies and the conflicts within and between the agencies, this arrangement can hardly serve a national goal. Given a shortage of supply, some agencies may support the market using their reserves, while others may buy and hoard grains to make a profit. Therefore, it is necessary to reform the grain reserve system to give it a single objective and to have it operate under clear guidelines and unified control.

## **5. Relationship between rural industrialisation and urbanisation and rural incomes**

Grain market deregulation and structural adjustment in the agricultural sector are important. However, due to the huge surplus of agricultural labour (see section 1), these measures will not be sufficient to absorb the shock of agricultural internationalisation. Policy adjustments are also needed to accelerate China's rural industrialisation and urbanisation.

During the economic reform period, particularly up to the mid 1990s, rural industry developed very quickly and made a major contribution to China's rapid economic growth (see the World Bank, 1996, Cai, 2000, and Wang, 2000). Employment in the Township and Village Enterprise (TVE) sector increased from 28 million to 135 million during the period 1978-96, accounting for more than one-fourth of the total rural labour force. TVEs produce at least one-quarter of the total industrial output. Development of the TVE sector has also made a great contribution to increases in farmers' incomes. Nearly one-half of rural household income now comes from non-agricultural sources, mainly from the TVE sector. Figure 2 shows that the level of rural income per capita in China's 31 provinces is closely associated with provincial achievements in rural industrialisation.

Figure 2: Relationship between rural industrialisation and rural income, year 2000



Note: Industrialisation is indicated by the share of TVE employment in rural labour.

Rural income is per capita rural pure income (Yuan).

Source: Calculated from NBS (2000a, 2001).

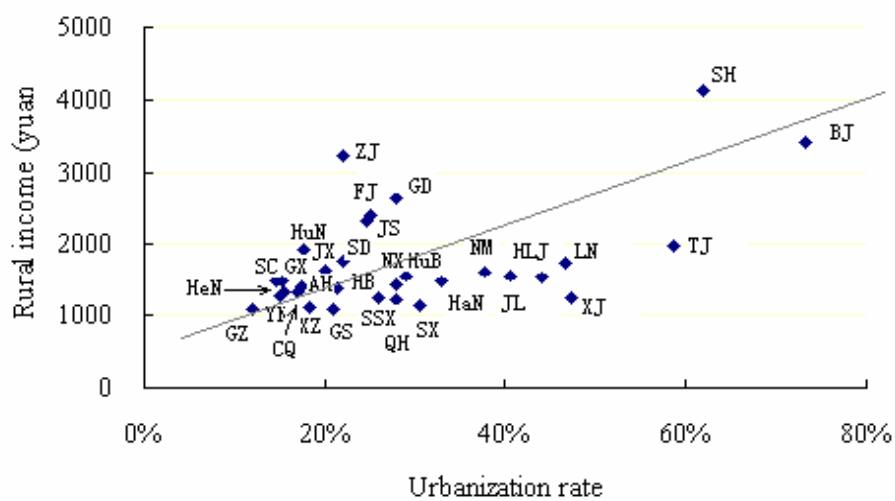
Rural industries experienced substantial development in the 1980s, partially because the rural reform created a better market environment while the urban economy was still heavily subject to central control. Government policies also had an important influence, encouraging development of TVEs in rural areas and discouraging rural-urban migration.

Development of rural industries slowed in the late 1990s, mainly due to sharper market competition, unfavourable location of the rural enterprises, difficulties in external finance, and lack of infrastructure facilities, technical inputs, and human resources. Meanwhile, urbanisation accelerated. Large numbers of rural labourers migrated to urban areas to find jobs. In year 2001, the urbanisation rate (the ratio of urban to total population) in China reached 38%, whereas it was only 26% in 1990 and 19% in 1980. Improvement in the availability of rural finance will certainly help in the development of rural industries. Nevertheless, the importance of rural industrialisation in the economy is likely to be replaced by urbanisation.

In spite of the acceleration in urban development, the rate of urbanisation in China is still 10-20 percentage points lower than the average of other countries at a similar income level (Wang and Xia, 1999). In particular, medium and large cities are in short supply compared with China's large population. In 2000, there were 121 million people living in the cities of 0.5 million population and above, accounting for only 9.6% of the national population. In the less-developed West region, people living in cities of these sizes only account for 5.6% of the region's population. If China had a similar urbanisation rate to the average of other countries at a similar income level, there would be an additional 120-240 million people living in urban areas. This number may also be thought of as the excess supply of people in the rural economy.

Figure 3 plots the urbanisation rate and rural income of China's 31 provinces in year 2000. It indicates a positive relationship between urbanisation and rural income: provinces having a higher urbanisation rate have a higher rural income. This relationship may imply that urbanisation helps to liberate redundant rural labour from arable land and therefore increases agricultural productivity. Considering that one-half of the Chinese labour force is still agricultural labour, urbanisation could have a significant impact on agricultural productivity.

Figure 3: Relationship between urbanisation and rural income, year 2000



Symbols of provinces:

BJ: Beijing

TJ: Tianjin

HB: Hebei

SX: Shanxi

NM: Neimenggu

LN: Liaoning	JL: Jilin	HLJ: Heilongjiang	SH: Shanghai	JS: Jiangsu
ZJ: Zhejiang	AH: Anhui	FJ: Fujian	JX: Jiangxi	SD: Shandong
HeN: Henan	HuB: Hubei	HuN: Hunan	GD: Guangdong	GX: Guangxi
HaN: Nainan	CQ: Chongqing	SC: Sichuan	GZ: Quzhou	YN: Yunnan
XZ: Xizang	SnX: Shannxi	GS: Gansu	QH: Qinghai	NX: Ningxia
XJ: Xinjiang				

Note: The urbanisation rate used is the proportion of urban to total employment in each province.

Source: NBS (2001).

## 6. A causality test on the impact of urbanisation and policy considerations

However, this urbanisation effect does not have to be the only explanation for the relationship shown in Figure 3, because both urbanisation and higher rural income can be an outcome of economic growth. In the following, we introduce a growth model to test the causality between urbanisation and regional economic growth. This model has its origins in neoclassical growth models and endogenous growth models (see, e.g., Solow, 1956, and Lucas, 1988) but includes variables representing urbanisation:

$$Y_{it} = A + a^1 K_{it} + a^2 H_{it} + a^3 D_{it} + a^4 L + a^5 U_{it-1} + a^6 DU_{i(t-1)} + \varepsilon_{it} \quad (1)$$

where  $Y_{it}$ ,  $K_{it}$ ,  $H_{it}$ ,  $D_{it}$  and  $L_{it}$  are growth rates of GDP, capital stock, human resources (indicated by workers' average year of schooling), cultivated land area and total employment, respectively, of the  $i$ th province in year  $t$ .  $U_{it-1}$  is the urbanisation rate with a one-year lag (the urbanisation rate used is the ratio of urban employment to provincial total employment).  $DU_{i(t-1)}$  is the difference of  $U_i$  between years  $t-1$  and  $t-2$ .  $\varepsilon$  is the error term.

Lagged variables of  $U$  and  $DU$  are used for the causality test between urbanisation and economic growth. This specification identifies the effect of urbanisation on growth if  $U$  or  $DU$  is significant. The reason for including both  $U$  and  $DU$  in the model is to distinguish the possible growth effect (long-run effect) and level effect (short-run effect) of urbanisation. A significant estimate of  $U$  indicates a continuing effect of urbanisation on growth (meaning urbanisation bring about higher productivity growth), whereas a significant estimate of  $DU$  indicates an impact from changes in the urbanisation rate on growth, which is a short-run effect.

To impose the restriction of constant returns to scale ( $a^3=1-a^1-a^2$ ), both sides of

equation (1) were divided by  $L_{it}$ :

$$y_{it} = A + a^1 k_{it} + a^2 h_{it} + a^3 d_{it} + a^5 U_{i(t-1)} + a^6 DU_{i(t-1)} + \varepsilon_{it} \quad (1')$$

where  $y$ ,  $k$ ,  $h$  and  $d$  are  $Y$ ,  $K$ ,  $H$  and  $D$  divided by  $L$ , respectively.

To see the possible differences in the urbanisation effect at the different levels of economic development,  $U_{i(t-1)}$  is replaced by three urbanisation variables for the East, Central and West regions. The East region is the most developed while the West region is the least developed of the three regions. Similarly, replacements are made to  $DU_{i(t-1)}$ .

$$\begin{aligned} y_{it} = A + a^1 k_{it} + a^2 h_{it} + a^3 d_{it} + a^7 U_{i(t-1)}^1 + a^8 U_{i(t-1)}^2 + a^9 U_{i(t-1)}^3 \\ + a^{10} DU_{i(t-1)} + a^{11} DU_{i(t-1)} + a^{12} DU_{i(t-1)} + \varepsilon_{it} \end{aligned} \quad (2)$$

Panel data for 25 provinces and covering the 20 years from 1979 to 1998 have been used. The other six provinces were excluded due to incomplete data. Data were provided by Fang Cai and Dewen Wang (2002) and from NBS (various years and 1999b). Capital stock was calculated from the historical data for capital formation in each province.

Both Fixed Effects and Random Effects models were estimated. Hausman's test rejects the hypothesis of the appropriateness of the Random Effects model, therefore the result of the Fixed Effects model is reported in Table 3.

Table 3: Modelling results: urbanisation and economic growth

Variable	Version 1'		Version 2	
	Coefficient	t-ratio	Coefficient	t-ratio
$k$	0.3481	(8.891**)	0.3552	(8.931**)
$h$	0.4315	(5.122**)	0.4261	(5.045**)
$d$	0.0157	(0.903)	0.0159	(0.911)
$U_{t-1}$	0.3753	(3.619**)		
$U^1$			0.3560	(2.698**)
$U^2$			0.5525	(2.835**)
$U^3$			0.0097	(0.031)
constant	-0.0837	(-2.383*)	-0.2119	(-2.265*)
	Dependent var.	$y$	Dependent var.	$y$
	$R^2$	0.3697	$R^2$	0.3726

Note: t ratios with \* and \*\* are significant at the 5% and 1% levels, respectively. For simplicity, coefficients of provincial dummy variables are not reported in this table.

Source: Estimation result. Original data are from NBS (2001, 1999b).

The two versions of the model produce similar results. Most coefficients are statistically significant at the 1% level. According to version (1'), the elasticities of capital, human resources, employment and land with respect to economic growth are 0.348, 0.431, 0.205 and 0.016, respectively, all in reasonable ranges. The elasticity of land is minor and insignificant, which is not surprising because the farming sector only contributes a small proportion to the economy. The estimates of  $U$  are significant, which indicates that every one percentage point in the urbanisation rate accelerates provincial economic growth by 0.37 percentage points over the 7-10 percent high growth rate.  $DU$  is omitted from the model due to insignificant coefficient estimates in previous regressions. These results suggest that urbanisation has a long-run impact on economic growth.

The major difference in the results of the second version of the model is the insignificant effect of urbanisation on economic growth in the less-developed West region. The effect is significant in the two other regions. There are two possible reasons for this result: a) the effect in the West region is insignificant because the achievement of urbanisation in the West has been relatively low; or b) contrary to the other regions, the urban economy in the West provinces has not experienced much restructuring, and is therefore less market-oriented and less efficient.

In general, the results identify a contribution from urbanisation to economic growth via productivity changes. A reasonable explanation for the higher productivity growth is improvement in resource allocation between the rural and urban sectors. This implies that accelerating urbanisation could be an important measure to counteract the short-run side effects of WTO accession on the agricultural sector, and to reduce the rural-urban income gap.

Urbanisation in China being behind other countries is mainly a result of the previous central government policies restricting rural-urban migration and growth of large cities. Some of these restrictions have been removed over the past decade, however, rural-urban migration is still partially restricted by the urban household registration system, job entry barriers, non-access or harder access to health care benefits and schooling, and public security protection, etc., against rural migrants. The

low level, or lack, of rural education, job training, and employment information services are also barriers against rural-urban migration. Policy adjustments to remove these restrictions, to improve rural education, and to provide government services on job training and employment information services are essential for accelerating urbanisation.

The current urban economy provides limited opportunity for rural migrants because the number and size of cities is limited. Expansion of the urban economy will provide employment opportunities, especially in China's under-developed services sector, which has a significantly higher proportion in the existing urban economy than in the rural economy. It is the government's responsibility to improve urban planning, urban infrastructure, public utilities, etc., in order to promote urban development. With these changes, many small cities and towns can be expected to become large or medium sized cities.

## **6. Conclusion**

The agricultural sector in China is seen as being labour-redundant, largely as the result of policies restricting the development of urban areas. These policies are also seen as a major reason for China's large and growing rural-urban income gap. The situation is worsening after the opening of China's grain market resulting from its WTO accession. In particular, the over-regulated domestic grain market and government pricing conflicts with the new situation of openness, since these result in over supply of grains. It is suggested that the domestic grain market should be liberalised and the grain pricing system should be deregulated.

For further solutions to the import shock on the agricultural sector as the result of WTO accession, the roles of rural industrialisation and urbanisation are examined. We find that urbanisation has positive effects on rural incomes and regional economic growth. Since the urbanisation rate in China is significantly lower than in other countries at a similar level of GDP per capita, we recommend that urbanisation should be accelerated by deregulating rural-urban migration, promotion of urban infrastructure, improvement in rural education, job training and employment

information services.

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