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Farmer Income Differential in Regions

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Abstract: China's success in reform and opening up policy for twenty years is regarded as China's miracles in the world, whereas the income differential widening phenomenon has been the focus of the policymakers and researchers. This article researches 1994–2003 China's rural regions income differential and its decomposition. The method this paper used to measure the disparity is Gini Index. There are many ways to compute it, so the easiest way to decompose Gini Index—Matrix method is adopted. And based on it, farmer's income could be divided into wage income, farming income, transfer income and property income according to its composition. The conclusion is that all of the indexes are between 0.2 and 0.3, at the comparatively average level. From the fluctuation trend, it increased from 1994 to 1995, while reduced from 1995 to 1996, fluctuated in 1997, and then diminished again. In general, farmer's regions income differential stays at comparatively average level, but it has the widening trend with time. Through decomposing Gini Index, wage income is the most important increasing factor, while farming income is the reducing factor.
Keywords: income differential; Concentration Index; structure effect; farmer; Gini Index

1 Introduction

China's success in reform and opening up policy for twenty years is regarded as China's miracles in the world, whereas the income differential widening phenomenon has been the focus of the policymakers and researchers. The typical research of personal income allocation in regions on microeconomic data has been done in China Social Science Research Institution, and by the special income allocation research team's household investigation, we could get the useful farmer's income information in 1988 and 1995. Just as Li Shi (2003) pointed out, it is always get the wrong results to talk about income differential ignoring the differences inside rural areas and urban areas, because people did not know how much the difference come from rural regions and how much from urban regions. So, it is necessary to discuss the differential in regions. Zhang Ping (1998) suggested that, based on the investigation data in 1988 and 1995, the farmer income differential in regions (different provinces) rose from 34% in 1988 to 55% in 1995, and the wage income mainly come from non-agricultural employment. But the separation of labor market, rural and urban discrepancy and restriction on flow of rural labor are bad for the reduction of income differential. Lin et al. (1998) found, after decomposing of the farmer's income, wage income and farming income's Gini contribution rate reached 58% and 35% in 1995, while Gini Index were 0.54 and 0.133. Furthermore, the trend of wage income Concentration Index went up from 1984 (Wan, 1998), reflecting that the farmer per capita income is widening in regions, as a result that farmers could not get the same employment opportunities, and unreasonable price of agricultural products against different region comparative advantages in regions. Wan (2001) pointed out, income allocation has deteriorated since China began its economic reform in 1978, and this trend seriously affect China's sustainable growth in economy, moreover, it will have a bad effect on social and political stability if this disparity is not relived. Brandt and Sands (1992) evaluated China's Gini Index of 3 villages in Hebei Province in the1930s, and they were 0.391, 0.346, 0.349. Rozelle (1994) computed the China's Gini Index in the 1930s, and the result was 0.33, while it dropped to 0.22 in the 1950s. After the foundation of People's Republic of China, because of the equality value orientation, income differential in the countryside was small and had little change (Adelman and Sunding, 1987), but it was higher than that in town and city, the main reason is the great difference between different regions (Griffin and Saith, 1982). When China began its reform and opening up, the income differential widened in different counties, provinces and regions (Gustafsson and Li, 2002). Most researchers thought that the change of farmer income disparity greatly related to reform of economic system (Zhao and Griffin, 1993; Zhao et al., 1999); but other researchers thought there was no necessary relations between income differential and pace of reform (Tsui, 1998), while the conclusion was only founded on two provinces household data investigation, so it could not stand up.

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2 Empirical Method and Data Selection

2.1 Empirical method

At present, the common method to measure the disparity is Gini Index. There are many ways to compute it, and this article adopts matrix method, by which it is easy to decompose Gini Index according to different origins, to analyze proportions of different income items in aggregations and to measure the degree of disparity.

The farmer's income could be divided into wage income, farming income, transfer income and property income according to its composition. So Gini Index (G) could be decomposed according to the above four sectors:

$$G = \sum_{K=1}^{4} (e_K/e) \times C_K \tag{1}$$

where e and e_k stand for farmer's net income and different incomes, C_K stands for Concentration Index of different incomes. C_K/G is comparative Concentration Index. If the Concentration Index of the Kth income is above 1, this income will widen the disparity; vice versa. G is between [0，1], and C_K may be a minus (Wan, 1998).

If $P_K = e_K/e$ denotes the ratio of the Kth income in total net income, Gini Index could be:

$$G = \sum_{K=1}^{4} P_K \times C_K \tag{2}$$

Thus, $P_K C_K/G \times 100\%$ means the Kth income item's contribution rate to Gini Index. By the data in consecutive time series, farmer's income differential could be decomposed into three parts:

$$\begin{aligned} \Delta G = G_{t+1} - G_t &= \sum_{K=1}^{4} P_{Kt+1} \times C_{Kt+1} - \sum_{K=1}^{4} P_{Kt} \times C_{Kt} \\ &= \sum \Delta P_K \times C_{Kt} + \sum P_{Kt} \times \Delta C_K + \sum \Delta P_K \times \Delta C_K \end{aligned} \tag{3}$$

In the above equation, $\sum \Delta P_K \times C_{Kt}$ indicates that the change of income structure leads to variation of Gini Index, called structure effect; $\sum P_{Kt} \times \Delta C_K$ denotes that the degree of concentration of each income item leads to variation of Gini Index, called concentration effect; $\sum \Delta P_K \times \Delta C_K$ denotes that the two factors' change leads to the variation of Gini Index, called comprehension effect.

2.2 Data and sample selection

This article computed Gini Index using provincial data as the unit, and all of the data came from China Statistics Yearbook and China Agricultural Yearbook (Editorial Committee for China Agricultural Yearbook, 1995; 1996; 1997; 1998; 1999; 2000; 2001; 2002; 2003; 2004; National Bureau of Statistics of China, 1995; 1996; 1997; 1998; 1999; 2000; 2001; 2002; 2003; 2004). The article mentioned that farmer income is net income, including wage income, farming income, property income and transfer income.

3 Analyses on Farmer Income Differential in Regions

The specific analysis on farmer's income differential refers to the overall trend of farmer's income level fluctuation and decomposition of farmer's income differential.

3.1 Overall analysis on farmer's income differential in regions

Since 1949, the farmer's income has been growing continuously, but the speed of growth showed fluctuation characteristically. Correspondingly, the Gini Index of farmer's income fluctuated drastically. Fig. 1 lists the Gini Index of farmer's per capita net income. All of the indexes were between 0.2 and 0.3, at the comparatively average level. From the fluctuation trend, it increased from 1994 to 1995, while reduced from 1995 to 1996, fluctuated in 1997, and then diminished again. In general, from 1994 to 1998 the income differential reduced, while in 1998–2000, increased; but after 2000, the differential widened smoothly.

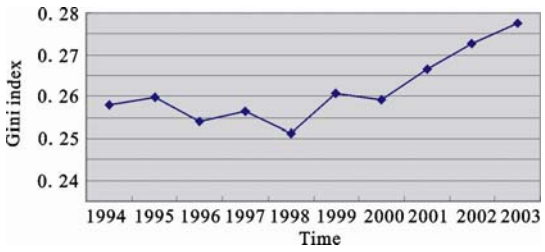

Fig. 1 Gini Index of farmers' per capita net income

3.2 Decomposition of farmer's income differential

3.2.1 Decomposition of farmer's income differential in regions

According to Equation 1, Table 1 lists the decomposition result of farmer's income differential in regions. From Table 1, it is showed that, except for wage income, farming income, transfer income and property income have no trend of changing with time, while Concentration Index of wage income diminished with time. The main reason is that farmer could not get rich only relying upon planting crops. In order to head for a life of reasonable comfort, more and more farmers entered into city to find a job, especially farmers coming from the mid-western China, which to some extent prompts the reduction of Concentration Index. On the other hand, it is related to China's agriculture support policy. From the comparative Concentration Index, the order is wage income>property income>transfer income>farming income, that is to say, the disparity degree of farmer's per capita income: wage income> property income> transfer income> farming income. This reflects the discrepancy of income origins. The income of farmer who work outside is more than those of farmers only relying on planting, which is the most important factor leading to the income differential. When comparing the other income,

Table 1 Decomposition of farmer's income differential

Year	Concentration Index				Comparative Concentration Index			
	Wage income	Farming income	Transfer income	Property income	Wage income	Farming income	Transfer income	Property income
1994	0.5441	0.1365	0.3649	0.3711	2.1088	0.5290	1.4143	1.4383
1995	0.5383	0.1348	0.3573	0.4142	2.0722	0.5190	1.3753	1.5944
1996	0.5262	0.1306	0.3248	0.3855	2.0727	0.5145	1.2794	1.5183
1997	0.5093	0.1325	0.3292	0.4806	1.9854	0.5167	1.2831	1.8735
1998	0.4898	0.1249	0.3150	0.4456	1.9488	0.4970	1.2534	1.7729
1999	0.4718	0.1347	0.3237	0.4301	1.8093	0.5165	1.2411	1.6492
2000	0.4553	0.1268	0.3510	0.4015	1.7556	0.4889	1.3534	1.5481
2001	0.4553	0.1287	0.4213	0.3564	1.7080	0.4828	1.5804	1.3371
2002	0.4460	0.1337	0.4992	0.3396	1.6344	0.4901	1.8294	1.2446
2003	0.4379	0.1446	0.3676	0.4321	1.5775	0.5209	1.3242	1.5566

the least differential is farming income, because agriculture is a weak industry, which needs government's support in funds and policy. Besides, from the comparative Concentration Index, wage income, transfer income and property income are all above 1, especially wage income, it is above 2. This indicates that wage income is the most important factor widening the differential, whereas, the farming income is the diminishing one.

3.2.2 Contribution rate of farmer's income differential in regions

According to Equation (2), Table 2 lists the contribution rate of farmer's per capita net income differential. The contribution rate of farmer's income is: wage income >farming income>transfer income>property income. This is basically the same as the proportion of each income in the total net income. From the fluctuation trend, only wage income's contribution rate rose obviously, particularly in 2000, and farming income descended violently. This shows wage income is the most important factor resulting in income differential, even it takes up a great share, and farming income's importance is dropping. Transfer income and property income have no obvious fluctuation trend.

Table 2 Contribution rate of farmer's income differential (%)

Year	Contribution rate			
	Wage income	Farming income	Transfer income	Property income
1994	55.33	35.68	5.31	3.68
1995	55.83	34.52	4.92	4.73
1996	57.71	34.05	4.50	3.74
1997	59.17	33.73	4.60	2.51
1998	60.79	31.44	4.95	2.81
1999	60.94	31.26	5.37	2.44
2000	63.69	28.47	4.58	3.27
2001	64.33	27.24	3.39	5.04
2002	64.05	26.70	4.29	4.97
2003	62.55	27.96	5.09	4.40

3.2.3 Decomposition of farmer's income differential in regions

According to Equation (3), Table 3 lists the decomposition results of farmer's income differential. From Table 3, comprehension effect does not have any trend change with time. The concentration effect and structure effect are the main power to push the change of regional differential. The structure effect indexes are all above 0, indicting it will widen the differential, while most concentration effect indexes are below 0, indicating it is the diminishing factor. Therefore, structure effect plays a dominant role, because structure effect is mainly influenced by wage income fluctuation, and the wage income is the principal origin of farmer's earnings. But simply focusing on concentration effect, it has the increasing trend, and the chief reason of which is that industry layout is getting reasonable in China.

Table 3 Decomposition of farmer's income differential in regions

Year	$\triangle G$	Concentration effect	Structure effect	Comprehension effect
1994–1995	0.0018	–0.0018	0.0034	0.0002
1995–1996	–0.0059	–0.0081	0.0021	0.0001
1996–1997	0.0026	–0.0009	0.0050	–0.0014
1997–1998	–0.0052	–0.0118	0.0068	–0.0003
1998–1999	0.0095	0.0007	0.0094	–0.0007
1999–2000	–0.0015	–0.0096	0.0088	–0.0007
2000–2001	0.0072	0.0025	0.0064	–0.0017
2001–2002	0.0063	0.0004	0.0061	–0.0001
2002–2003	0.0048	0.0034	0.0045	–0.0032

4 Conclusions and Suggestions

Through computing the Gini Index of farmer's per capita net income in regions, and decomposing income structure, the conclusion is that at present farmer's income in

China stays at comparatively average level, but with time, income differential shows the trend of widening and the each income contributing to the farmer's income fluctuation is follows: wage income leads to widening income differential, while farming income reducing, and transfer income and property income have no obvious influence. Hence, it is suggested that government should invest more transfer payment to the poor regions, establish new farmer vocational education system adapting to urbanization, industrialization and agriculture modernization, improve farmer's ability to choose career, employ and establish new business. And by the discrepant investment policy in regions, it is expected to transfer and dispread the capital and techniques in developed regions to the poor ones, to speed up the technique innovation of agricultural products processing enterprises in order to improve its product's competitive ability, to promote economic development of the midwestern China, and to provide more non-agricultural employment chances for farmers.

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