

UNU-WIDER

30 YEARS OF RESEARCH  
FOR DEVELOPMENT

WIDER Working Paper 2015/005

## **Rural household income mobility in transitional China**

Evidence from China Household Income Project

Sui Yang\*

January 2015

**Abstract:** Based on China Household Income Project rural data, this paper aims to study the changes of rural household income mobility in transitional China. The results show that with the economic reform and development, income mobility between 2007 and 2009 was much stronger than before. Regarding the structure of income mobility, the ‘exchange mobility’ is generally the major source, followed by the ‘growth mobility’. The comparison with income inequality indicated that the low degree of mobility is not conducive to the narrowing of inequality. However, the high degree is not accompanied by the substantial reduction of income gaps either.

**Keywords:** income mobility, inequality, rural China

**JEL classification:** D63, O15, R20

**Acknowledgements:** The author would like to thank the Asian Development Bank, the Australian government (Australian Research Council and AusAID), the Ford Foundation, the Institute for the Study of Labor, the Swedish International Development Agency, and the University of Western Ontario who funded China Household Income Project surveys that provided the data for this research.

---

\*Rural Development Institute, Chinese Academy of Social Sciences; yangsui@cass.org.cn

This paper has been presented at the UNU-WIDER Conference on ‘Inequality - Measurement, Trends, Impacts, and Policies’, held 5-6 September 2014 in Helsinki, Finland.

Copyright © UNU-WIDER 2015

ISSN 1798-7237 ISBN 978-92-9230-890-2 <https://doi.org/10.35188/UNU-WIDER/2015/890-2>

Typescript prepared by Minna Tokkari at UNU-WIDER.

UNU-WIDER gratefully acknowledges the financial contributions to the research programme from the governments of Denmark, Finland, Sweden, and the United Kingdom.

The World Institute for Development Economics Research (WIDER) was established by the United Nations University (UNU) as its first research and training centre and started work in Helsinki, Finland in 1985. The Institute undertakes applied research and policy analysis on structural changes affecting the developing and transitional economies, provides a forum for the advocacy of policies leading to robust, equitable and environmentally sustainable growth, and promotes capacity strengthening and training in the field of economic and social policy-making. Work is carried out by staff researchers and visiting scholars in Helsinki and through networks of collaborating scholars and institutions around the world.

UNU-WIDER, Katajanokanlaituri 6 B, 00160 Helsinki, Finland, wider.unu.edu

The views expressed in this publication are those of the author(s). Publication does not imply endorsement by the Institute or the United Nations University, nor by the programme/project sponsors, of any of the views expressed.

## 1 Introduction

Since the late 1970s and early 1980s when the economic reforms were initiated, China has achieved fast economic growth and a substantial rise of income level. At the same time, China has experienced increasingly rising income inequality (Griffin and Zhao 1993; Riskin et al. 2001; Gustafsson et al. 2008; Ravallion and Chen 2007; Li et al. 2013). The income inequality in China as a whole in terms of Gini coefficients, increased from 0.28 in 1983 to 0.48 in 2007 (Ravallion and Chen 2007; Li et al. 2013). Meanwhile, rural income growth and inequality displayed almost the same pattern in China. The rural household net income per capita was only CNY686 in 1990, and first surpassed CNY2,000 in 1997. It was more than CNY5000 in 2009, and close to CNY8000 in 2012. Along with the increase of income level, the Gini coefficient expanded gradually from 0.31 in 1990 to almost 0.39 in 2011 (NBS 2012).

In studying the income distribution, the cross-sectional data only capture a static income disparity, while the income mobility based on the longitudinal data will characterize the income variations across years. Both the income gap in any given year and long-term income status reflect the income inequality. However, the latter is more important. If the position of particular families in income hierarchy varies widely from year to year, the short-term income distribution would not be solidified, and low-income earners have a good chance to be high-income earners. The inequality is a sign of social mobility, and equality of opportunity (Friedman 1962; Krueger 2012).

A lot of attention has been paid to the static income inequality in rural China. How about the income mobility? Using the data from the Ministry of Agriculture in China, Sun et al. (2007) found that during the period from 1986 to 2001, the rural household income mobility was peaked between 1991 and 1995, and also higher than urban household income mobility. Their results further suggested that education and migration played positive effects on rural household income growth. Based on the China Household Income Project (CHIP) survey data, Luo (2009) also pointed out that the increase of rural household income mobility since the 1990s was caused by the increasing number of rural-to-urban migrant workers and more opportunities for non-agricultural employment to some extent. In addition, the household size was an important factor influencing the income mobility (Zhang et al. 2007; Khor and Pencavel 2010).

Compared with urban household income mobility, Wang (2005) found that the rural household income mobility was higher according to the data from China Health and Nutrition Survey (CHNS) during 1989 to 1997. The same results were indicated by Wang and Hu (2008) based on CHNS data from 1989 to 2006. Using CHIP data, Khor and Pencavel (2010) found that the rural household income mobility was lower than urban household in the early 1990s, and then changed to be a little bit higher from 1998 to 2002. Regarding to the effect of income mobility on inequality, existing literature on rural household income mobility suggest that the income mobility would help improve the income distribution and therefore narrow the income gap (Wang 2005; Wang and Hu 2008; Shi et al. 2010; Zhou and Wang 2010).

Based on CHIP 1995, 2002, 2007, 2008, and 2009 rural data, this paper aims to study the changes of rural household income mobility in China since the 1990s. Specifically, three questions will be addressed. First, what is the trend of income mobility in rural China? Building on studies on the mobility, income transition matrices are used to demonstrate the comprehensive macro picture. Second, what is the structure of Chinese rural household income mobility? A decomposition of income mobility indices into three basic sources is adopted to see what lies behind income mobility. Third, comparisons between the mobility index and inequality index are made to explore the relationship between income mobility and inequality. Our

expected contributions are two-fold. The latest CHIP data enable us to update the pattern of household income mobility and inequality in rural China. In addition, the study on dynamic changes of income helps us to better understand income distribution and characterize the long-term economic welfare.

This paper is structured as follows. In Section 2, we discuss the data used in this paper and provide some descriptive statistics of the data. Section 3 shows the trend of rural household income mobility reflected by income transition matrices. In Section 4, we present the decomposition results to explore the structure of income mobility in rural China. Section 5 investigates the relationship between income mobility and inequality. The paper is concluded in Section 6.

## 2 Data

CHIP is widely considered to be among the best available national survey data on household income and it is suitable to track the dynamics of income distribution in China. CHIP contains four repeated cross-sections for 1988, 1995, 2002, and 2007. All four waves of CHIP include urban and rural households, and samples were drawn from larger National Bureau of Statistics' (NBS) urban and rural samples using a multistage stratified probability method to be nationally representative. In the light of the increasing importance of rural-to-urban migration, a survey of rural-to-urban migrants has been added to CHIP since the 2002 wave.

To have a picture of rural household income mobility in China, a panel dataset needs to be employed. Fortunately, income data was provided retrospectively in 1995 and 2002 waves for CHIP rural samples. In the 1995 wave, most of the incomes in rural households were reported under the aggregated family unit, and retrospective questions on rural household net income were asked for the years 1991, 1993, and 1995. In the 2002 wave, rural residents were asked to report their incomes from 1998 to 2002. There are 7998 rural households in the CHIP 1995 wave, and the corresponding figure in the 2002 CHIP wave is 9200. In this paper, households with complete income information were kept, so that the 1995 CHIP panel sample concluded 5900 rural households, and the 2002 CHIP rural panel sample concluded 8912 households.

CHIP 2007, 2008, and 2009 waves included both cross-sectional surveys and longitudinal surveys, and all covered urban, rural, and migrant households. Rural samples were still drawn from the larger NBS household survey samples, and rural household net incomes in each year were provided, so that they were compatible with former waves. In this paper CHIP 2007, 2008, and 2009 data was identical to the Longitudinal Survey on Rural-to-Urban Migration in China (RUMiC) 2008, 2009, and 2010 data respectively. There were 8000 rural household in CHIP 2007 (or RUMiC 2008), 7999 rural households in CHIP 2008 (or RUMiC 2009), and 7993 rural households in CHIP 2009 (or RUMiC 2010). Consequently, the inclusion of the longitudinal data enables us to study the dynamic changes of rural household income. The three-year panel data concluded 7866 rural households.

To make the data comparable across years, we adopt rural household net income per capita and adjust the data to 2009 values using a rural consumption price index at provincial level. Table 1 presents the descriptive results of income based on the panel data we used in the paper.

Table 1: The level and growth of rural household net income per capita

	1991	1993	1995	1998	2000	2002	2007	2009
Nominal income								
Mean	731.88	990.96	1,526.79	2,004.87	2,356.65	2,598.29	4,895.26	5,967.16
Growth rate (%)		35.40	54.07		17.55	10.25		21.90
Median	580.67	758.2	1,207.33	1,640.00	1,897.67	2,066.00	3,931.84	4,765.32
Growth rate (%)		30.57	59.24		15.71	8.87		21.20
S.D.	628.15	944.59	1,281.74	1,592.38	1,873.43	2,187.27	4,058.52	5,098.31
Real income (at 2009 price)								
Mean	1,752.27	1,944.97	2,071.31	2,455.57	2,926.42	3,209.37	5,159.96	5,967.16
Growth rate (%)		11.00	6.50		19.17	9.67		15.64
Median	1,418.50	1,557.62	1,684.02	2,034.99	2,381.68	2,577.97	4,161.79	4,765.32
Growth rate (%)		9.81	8.11		17.04	8.24		14.50
S.D.	1,451.81	1,718.09	1,617.06	1,891.07	2,255.41	2,617.37	4,236.93	5,098.31

Notes: S.D.=Standard deviation.

Source: Author's calculation based on CHIP data.

In terms of nominal income, in the early 1990s, the average household net income per capita in rural China increased from CNY731.88 in 1991 to CNY990.96 in 1993, further to CNY1,526.79 in 1995. For the panel sample from 1998 to 2002, the mean income increased from CNY2,004.87 in 1998 to CNY2,356.65 in 2000, further to CNY2,598.29 in 2002. In 2007, the average income level was CNY4,895.26. In 2009, it reached CNY5,967.16. Regarding the growth rate, it was peaked at 54 per cent during the period 1993-95. Around 2000, the growth rate slowed down. From 2007 to 2009, it was 21.9 per cent.

In terms of real incomes at 2009 prices, in the early 1990s, the average household net income per capita increased from CNY1,752.27 in 1991 to CNY1,944.97 in 1993, further to CNY2,071.31 in 1995. For the panel sample from 1998 to 2002, the mean income increased from CNY2,455.57 in 1998 to CNY2,926.42 in 2000, further to CNY3,209.37 in 2002. In 2007, the average income level was CNY5,159.96. In 2009, it reached CNY5,967.16. Compared with the nominal growth rate, the real growth rates were much smaller due to inflation in the early 1990s. However, there appeared deflation around 2000, the real growth rate was higher than the nominal growth rate.

### 3 The trend of income mobility: Transition matrix

What is the trend of income mobility in rural China during the transition? What is the difference across periods? We answer these questions by constructing income transition matrices for the periods 1991-93, 1993-95, 1998-2000, 2000-02, and 2007-09. The five-by-five transition matrices, based on rural household per capita net income, are presented in Table 2. In each period, we cross-classify the sample into income quintiles from the bottom or poorest quintile (1) to the top or richest quintile (5) with an equal number of people in each quintile. Each element of the income transition table denoted as  $P_{ij}$  shows the fraction of sample in income quintile  $i$  in one year that occupies income quintile  $j$  in a subsequent year.

From 1991 to 1993, 70 per cent of the poorest fifth in 1991 remained in the same quintile in 1995, only one per cent jumped into the richest fifth of the sample. For the second quintile, 49 per cent stayed in the same group, 20 per cent fell into the poorest fifth, and 23 per cent came into the third quintile. In the case of the third quintile, 44 per cent remained in the same quintile and a same fraction of people (23 per cent) fell into the second quintile or rose into the fourth

quintile. For the fourth quintile, 50 per cent stayed, 18 per cent fell into the third quintile and 23 per cent rose into the highest quintile. Then, 75 per cent of those who occupied the richest fifth in 1991 found themselves in the same quintile in 1993, while 18 per cent fell into the fourth quintile. The income transition matrix for the period from 1993 to 1995 was similar to the period from 1991 to 1993, while these entries in the main diagonal were a little bit smaller. In addition, there is a tendency for a greater incidence of increases in relative incomes for the poor.

Table 2: Income transition matrices: Rural household net income per capita

		1	2	3	4	5			1	2	3	4	5
		Year 1993							Year 1995				
1	Year 1991	0.70	0.20	0.06	0.03	0.01	Year 1993	0.67	0.19	0.09	0.04	0.02	
2		0.20	0.49	0.23	0.06	0.02		0.22	0.41	0.24	0.10	0.03	
3		0.05	0.23	0.44	0.23	0.04		0.07	0.29	0.34	0.21	0.09	
4		0.03	0.06	0.23	0.50	0.18		0.03	0.09	0.29	0.39	0.19	
5		0.01	0.02	0.04	0.18	0.75		0.01	0.02	0.04	0.26	0.67	
		Year 2000							Year 2002				
1	Year 1998	0.75	0.17	0.04	0.02	0.02	Year 2000	0.63	0.21	0.09	0.04	0.02	
2		0.20	0.58	0.16	0.04	0.02		0.20	0.44	0.22	0.10	0.04	
3		0.04	0.19	0.55	0.17	0.05		0.09	0.20	0.41	0.21	0.08	
4		0.02	0.04	0.23	0.56	0.15		0.04	0.10	0.19	0.45	0.21	
5		0.00	0.01	0.02	0.21	0.76		0.03	0.05	0.07	0.20	0.65	
		Year 2009							Average jump				
1	Year 2007	0.48	0.27	0.13	0.08	0.04	1991-93		0.536				
2		0.28	0.32	0.22	0.13	0.05	1993-95		0.667				
3		0.13	0.24	0.30	0.23	0.09	1998-2000		0.441				
4		0.08	0.12	0.24	0.33	0.22	2000-02		0.692				
5		0.04	0.05	0.10	0.22	0.60	2007-09		0.881				

Source: Author's calculation based on CHIP data.

Between 1998 and 2000, the figures in the diagonal became larger than the previous two periods, especially for the middle three ones, indicating the lower income mobility. During 2000 to 2002, the figures in the diagonal turned to be smaller again. The proportions of the poorest or richest remained in the same quintile decreased obviously.

From 2007 to 2009, these entries in the main diagonal were noticeably smaller than the corresponding values in any of previous four periods. The percentage of rural households in the bottom quintile in 2007 who found themselves remaining in the same quintile dropped to 48 per cent, and 60 per cent of those who occupied the richest quintile kept stable. Moreover, there appeared a considerable increase in quintile movements. These suggest greater income mobility than before.

The figures in the diagonal help reveal the immobility vividly. To facilitate comparisons of income mobility across periods, one summary indicator of income mobility embodied in the transition matrix is calculated. The average jump calculates the mean number of quintiles moved in absolute between two periods (Atkinson et al. 1992). It is defined as:

$$\text{Average jump} = \frac{1}{n} \sum_{i=1}^n \sum_{j=i-1}^{i+1} |j - i| \cdot p_{ij} \quad (1)$$

As reported in Table 2, the average jump was 0.536 from 1991 to 1993, and then increased to 0.667 during 1993 to 1995. However, it was lowest between 1998 and 2000 with the value of 0.441. Since 2000, the average jump grew significantly from 0.692 in the period of 2000-02 to 0.881 in the period of 2007-09.

Generally, the relative of income mobility suggested by the income transition matrices were not great in the 1990s though accompanied with some fluctuations. Since 2000, the strengthening trend of income mobility was clear. Between 2007 and 2009, the fraction of immobility decreased remarkably and the proportions of quintile movements increased strikingly.

However, the picture of income mobility revealed by the income transition matrix bears some limitations. First, the magnitude of mobility heavily depends on the number of income groups, or is sensitive to the choice of the range over which movement (i.e. quintiles, deciles, and so on) is measured. The more groups are divided, the greater is the income mobility. Second, it only captures the relative income movement, while it ignores the inter-group mobility and the effect of income growth.

#### 4 The structure of income mobility: Decomposition

In order to describe the multi-dimensional mobility and examine the structure of mobility, we will employ the mobility indices which are decomposable. Fields and Ok (1996, 1999) proposed a measure of the movement in total absolute income or log-income movement in a society. They are formulated as follows:

$$M_{F-0-1}(x, y) = \frac{1}{n} \sum_{i=1}^n |y_i - x_i| \quad (2)$$

$$M_{F-0-2}(x, y) = \frac{1}{n} \sum_{i=1}^n |\log y_i - \log x_i| \quad (3)$$

Where  $n$  is the number of observations in the economy, and  $x_i$  and  $y_i$  are the initial and final incomes, respectively. These two indices both gauge the extent of fluctuation in incomes and are called ‘non-directional income movement’ or ‘flux’ (Fields 2008). Furthermore, a decomposition of income mobility indices into three basic sources (Van Kerm 2004) will be adopted to see what the structure of absolute income mobility is.

The method of income mobility first proposed by Markandya (1984) is to separate the effects of changes in individuals’ positions and change in the shape of the income distribution, which are named ‘exchange mobility’ and ‘structural mobility’, respectively. Van Kerm (2004) further divided the latter mode into growth and dispersion components. Demonstrated as Equation (4), the decomposition divides the index  $M(y)$  into these three components, and the corresponding contribution of these three sources to the total income mobility can also be calculated.

$$M(\mathbf{y}) = M^G(\mathbf{y}) + M^D(\mathbf{y}) + M^E(\mathbf{y}) \quad (4)$$

Where  $M^G(y)$  represents the ‘growth mobility’,  $M^D(y)$  captures the ‘dispersion mobility’, and the ‘exchange mobility’ is illustrated by  $M^E(y)$ .

Specifically, when considering the process of  $y^0 \rightarrow y^1$ , define  $G(y; y^1)$ ,  $D(y; y^1)$ , and  $E(y; y^1)$  as three transformation functions, when applied to generate counterfactual income vectors that incorporate, respectively, the growth component, the dispersion component, and the exchange component, but leave all other factors unchanged.

$$\begin{aligned}
G(\mathbf{y}; \mathbf{y}^1) &= \frac{\mu^1}{\mu} \times \mathbf{y} \\
D(\mathbf{y}; \mathbf{y}^1) &= \frac{\mu}{\mu^1} \times L \times \mathbf{y} \\
S(\mathbf{y}; \mathbf{y}^1) &= G \circ D(\mathbf{y}; \mathbf{y}^1) = D \circ G(\mathbf{y}; \mathbf{y}^1) = L \times \mathbf{y} \\
E(\mathbf{y}; \mathbf{y}^1) &= P'_{\mathbf{y}^1} \times \mathbf{y}
\end{aligned} \tag{5}$$

where  $\mu$  is the mean of income  $\mathbf{y}$ ,  $L$  is a  $n \times n$  diagonal matrix, and  $P'_{\mathbf{y}^1}$  is a  $n \times n$  permutation matrix that ranks  $\mathbf{y}^1$  in increasing order.

Therefore,  $M^G(\mathbf{y}) = M(\mathbf{y}^0, G(\mathbf{y}^0; \mathbf{y}^1))$  represents the ‘growth mobility’,  $M^D(\mathbf{y}) = M(\mathbf{y}^0, D \circ G(\mathbf{y}^0; \mathbf{y}^1)) - M(\mathbf{y}^0, G(\mathbf{y}^0; \mathbf{y}^1))$  captures the ‘dispersion mobility’, and the ‘exchange mobility’ is illustrated by  $M^E(\mathbf{y}) = M(\mathbf{y}^0; \mathbf{y}^1) - M(\mathbf{y}^0, D \circ G(\mathbf{y}^0; \mathbf{y}^1))$ . Besides, the structural mobility  $M^S(\mathbf{y}) = M^G(\mathbf{y}) + M^D(\mathbf{y})$ .

Vividly, consider the following four hypothetical processes with  $n = 3$

$$\text{I : } \mathbf{x}=(1,2,3) \rightarrow (3,2,1)=\mathbf{y}$$

$$\text{II : } \mathbf{x}=(1,2,3) \rightarrow (2,4,6)=\mathbf{y}$$

$$\text{III : } \mathbf{x}=(1,2,3) \rightarrow (0,2,4)=\mathbf{y}$$

$$\text{IV : } \mathbf{x}=(3,1,2) \rightarrow (5,6,7)=\mathbf{y}$$

In Process I, individuals only exchange their positions. This is defined as the pure ‘exchange mobility’. Process II represents the pure ‘growth mobility’, which means individuals’ incomes increase or decrease according to the same scale. The pure ‘dispersion mobility’ is exhibited by Process III, in which total income is redistributed among individuals while without any change in ranks.

The mobility in Process IV is a combination of the above three components, and thus can be split into three parts. First, the income vector  $\mathbf{x}=(3,1,2)$  can be changed to vector  $\mathbf{x}_1=(1,2,3)$  by ‘exchange mobility’. Second, we find the mean of income is 2 initially and 6 finally, so the ‘growth mobility’ makes  $\mathbf{x}_1=(1,2,3)$  to be  $\mathbf{x}_2=(3,6,9)$ . Finally, it is obvious that the transformation between  $\mathbf{x}_2$  and  $\mathbf{y}$  is a pure ‘dispersion mobility’.

It is noted that one major shortcoming of such a sequential decomposition procedure is the dependence of the estimated contributions upon the sequence adopted to introduce the factors (Van Kerm 2004). This paper will present the non-hierarchical decomposition results.

Table 3 shows the income mobility reflected by the total income or log income movements, and as well as the decomposition results. In the first two periods, both the absolute and relative levels of ‘exchange mobility’ increased, while the ‘growth mobility’ and ‘dispersion mobility’ decreased both in absolute and relative terms. The ‘exchange mobility’ contributed the most, followed by the ‘growth mobility’, and the last is ‘dispersion mobility’. During 1998 to 2000, the share of ‘exchange mobility’ decreased significantly, while the ‘growth mobility’ increased substantially.

During this period, the total income mobility was also much less than in the early 1990s. Between 2000 and 2002, the ‘exchange mobility’ grew again and the total income mobility also became stronger. From 2007 to 2009, though the ‘growth mobility’ increased, the ‘exchange mobility’ was still the major source and the level of total income mobility was much more than the previous four periods. Besides, the ‘dispersion mobility’ did not vary too much among these five periods.

Generally, the ‘exchange mobility’ due to the re-ranking of positions is the major source of income mobility in rural China during the transition.

Table 3: The decompositions of income movement indexes

	1991-93	1993-95	1998-2000	2000-02	2007-09
Non-directional income movement	517.99	636.52	700.04	1066.60	2357.41
Exchange	392.65 (75.80%)	554.09 (87.05%)	376.97 (53.85%)	858.47 (80.49%)	1774.75 (75.28%)
Growth	109.48 (21.14%)	66.74 (10.49%)	305.95 (43.70%)	180.28 (16.90%)	523.02 (22.19%)
Dispersion	15.86 (3.06%)	15.68 (2.46%)	17.12 (2.45%)	27.85 (2.61%)	59.64 (2.53%)
Non-directional log income movement	0.2848	0.3179	0.2592	0.3503	0.4441
Exchange	0.2191 (76.94%)	0.2777 (87.34%)	0.1514 (58.43%)	0.2948 (84.15%)	0.3571 (80.41%)
Growth	0.0548 (19.24%)	0.0300 (9.43%)	0.1031 (39.77%)	0.0471 (13.45%)	0.0736 (16.57%)
Dispersion	0.0109 (3.82%)	0.0103 (3.23%)	0.0046 (1.79%)	0.0084 (2.39%)	0.0134 (3.02%)

Source: Author’s calculation based on CHIP data.

## 5 Mobility and inequality

What is the relationship between mobility and inequality? The aim of studying income mobility is eventually to improve the income distribution and narrow the income gap. Captured by the Gini coefficient and Theil index, Table 4 presents the inequality of household net income per capita in rural China. According to the panel samples in CHIP data, the Gini coefficient was 0.3748 in 1991, and kept decreasing to 0.3598 in 1995. It was 0.3417 in 1998 while it increased again to 0.3619 in 2002. In 2007, the Gini coefficient declined slightly to 0.3555 but grew to 0.3681 in 2009. The trends reflected by Theil index yield the similar pattern.

Generally, the income inequality in the panel sample from 1991 to 1995 decreased noticeably. Regarding the panel sample during 1998 to 2002, the income gap was widening. So does in the panel sample of 2007-09.

Table 4: The changes of income inequality

	1991	1993	1995	1998	2000	2002	2007	2009
Gini coefficient	0.3748	0.3726	0.3598	0.3417	0.3498	0.3619	0.3555	0.3681
Change (%)		-0.59	-3.41		2.37	3.47		3.54
Theil index	0.2475	0.2535	0.2292	0.2096	0.2160	0.2346	0.2290	0.2437
Change (%)		2.42	-9.59		3.07	8.62		6.39

Source: Author's calculation based on CHIP data.

In the literature, there are mainly three income mobility indices based on the measurement of inequality (Shorrocks 1978; Chakravarty et al. 1985; Fields 2010).

Shorrocks (1978) studied how the income mobility would reduce inequality. He first defined a rigidity index  $R$  as follows:

$$R = \frac{I(y_{agg})}{\sum_k \omega^k I(y^k)} = \frac{I(y_{agg})}{\sum_k \frac{\mu(y^k)}{\mu(y_{agg})} I(y^k)} \quad (6)$$

Where  $I(\cdot)$  is the measurement of inequality, i.e. Gini coefficient, Theil index, and so on.  $\mu(\cdot)$  is the mean of income.  $y_{agg}$  is the total incomes over  $k$  years. Thus, the Shorrocks rigidity index has in the numerator the inequality of T-period incomes using an inequality measure  $I(\cdot)$ , and in the denominator a weighted average of the inequalities in each year, with the weights being the ratio of the mean income in that year to the mean income over  $k$  years.

Therefore, the Shorrocks mobility measure is then  $M_s \equiv 1 - R$ .

According to the social welfare function (SWF), Chakravarty et al. (1985) proposed Chakravarty, Dutta and Weymark (CDW) mobility index defined as follows:

$$M_{CDW} \equiv \frac{E(y_{agg})}{E(x)} - 1 \quad (7)$$

where  $E(\cdot)$  is an equality measure,  $y_{agg}$  is aggregate income over the observation period, and  $x$  is income in the first period. If expressed by the inequality measure,  $I(\cdot) = 1 - E(\cdot)$ , then CDW index can be written as:

$$M_{CDW} = \frac{I(x) - I(y_{agg})}{1 - I(x)} \quad (8)$$

Furthermore, Fields (2010) develops a new class of measures of mobility as an equalizer of longer-term incomes. It is defined as:

$$M_E = 1 - \left( \frac{I(\mu)}{I(x)} \right) \quad (9)$$

where  $\mu$  is the average income. If the inequality of long-term incomes is smaller, the  $M_E$  index would be larger.

Fields (2010) also pointed out that the Shorrocks index ( $M_s$ ) was not intended to quantify the direction and the extent of the difference between the inequality of longer term income and the

inequality of base year income. From the perspective of social welfare, the Fields index as an equalizer of longer term incomes ( $M_E$ ) is also different from the CDW index ( $M_{CDW}$ ).

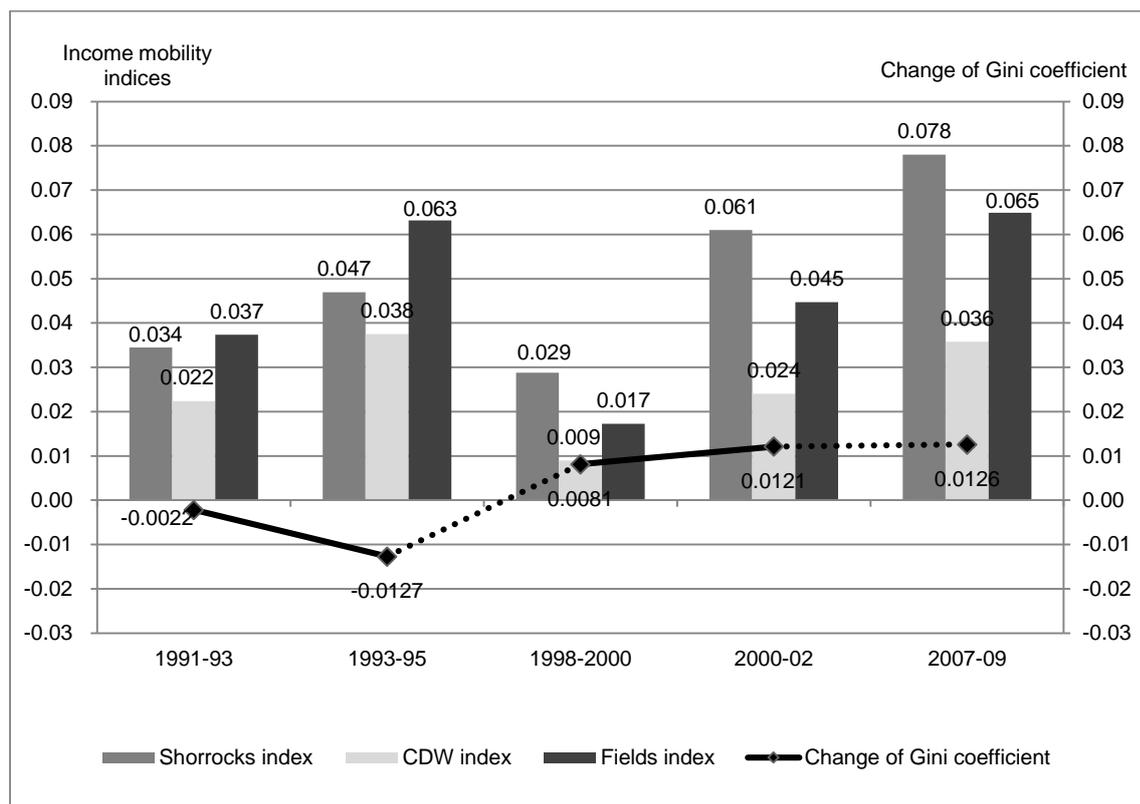
Figure 1 demonstrates the changes of the above three indices based on the inequality measure in terms of Gini coefficient across the five periods we examined.

According to the definition of the Shorrocks mobility index ( $M_S$ ), the lower income mobility does not favour the decrease of income inequality. Does it mean higher mobility would help reduce the income gap? The results showed in Figure 1 cannot be concluded explicitly. The Shorrocks mobility index was highest during 2007 to 2009, followed by the period between 2000 and 2002. However, the increase of the Gini coefficient in the fourth period was smaller than in the fifth period. This index was smallest in the period from 1998 to 2000, while the Gini coefficient still expanded. Generally, from 1991 to 1995, the increase of the Shorrocks index was accompanied with the decrease of the Gini coefficient. However, since 1998, both increasing trends were found in the Shorrocks index and the Gini coefficient. Therefore, the bigger the Shorrocks index was, the more changes (increase or decrease) in income inequality.

Meanwhile, if inequality of total income is smaller than initial inequality, the CDW index ( $M_{CDW}$ ) would be larger. Similarly, the larger Fields index ( $M_E$ ) means the distribution of long-term incomes is much more equal, and then the income mobility is beneficial to the equalization of income distribution. As revealed in Figure 1, the CDW index was highest in the period from 1993 to 1995, and second highest in the period from 2007 to 2009. Regarding the Fields index, it is highest from 2007 to 2009, and followed between 1993 and 1995. Obviously, the inequality decreased most from 1993 to 1995, while it increased most from 2007 to 2009.

Generally, the income inequality was very high in the early 1990s in rural China. Though the income mobility was not strong, the income gap was narrowing, especially in the period from 1993 to 1995 according to the CHIP panel data. From 1998 to 2000, income mobility was still weak while inequality widened. Since 2000, the increase of income mobility was accompanied by the deterioration of inequality. Therefore, strong income mobility does not necessarily lead to the reduction of income inequality, which would further depend on the structure and source of mobility. Combined with the decomposition results, the 'exchange mobility' would contribute to the narrowing of income gap.

Figure 1: The comparisons between mobility indexes and changes in Gini coefficient



Source: Author's calculation based on CHIP data.

## 6 Conclusion

Using CHIP 1995, 2002, 2007, 2008, and 2009 rural household survey data, this paper first examines the trend of rural household income mobility in transitional China, and then explores the structure of mobility, finally discusses the relationship between income inequality and mobility.

Our results show that rural household income mobility is closely related to the economic reform and development. In rural China, the economic development lagged behind in 1990s because of the urban-prone reform policies. Rural net household per capita income increased slowly and the overall income mobility was not strong. By the early 2000s, rural income mobility was still weak, and income inequality in rural China worsened simultaneously with the widening of urban-rural gap. Consequently, the government attached importance to the 'Three Rural' issues again. At the same time, with the barriers of rural-urban migration eliminating gradually, more and more rural surplus labour force turned to non-agricultural employment. Thus, rural residents' income sources diversified and income level increased significantly. From 2007 to 2009, the mobility of rural household per capita net income boosted up notably.

Regarding to the structure of income mobility, the decompositions show that the exchange component due to the re-ranking of positions is the most important part of income mobility. The more shares it contributes, the higher degree of income mobility. Compared with income inequality, the results indicated that the low degree of income mobility is not conducive to the narrowing of inequality. However, the high degree of mobility is not accompanied by the substantial reduction of income gaps either.

## References

- Atkinson, A.B., F. Bourguignon, and C. Morrisson (1992). *Empirical Studies of Earnings Mobility*. London: Harwood Academic Publishers.
- Chakravarty, S.R, B. Dutta, and J.A. Weymark (1985). 'Ethical Indices of Income Mobility'. *Social Choice and Welfare*, 2(1): 1-21.
- Fields, G.S. (2008). 'Income Mobility'. In L. Blume, and S. Durlauf (eds), *The New Palgrave Dictionary of Economics*. New York, NY: Palgrave Macmillan.
- Fields, G.S. (2010). 'Does Income Mobility Equalize Longer-Term Incomes? New Measures of an Old Concept'. *The Journal of Economic Inequality*, 8(4): 409-27.
- Fields, G.S., and E.A. Ok (1996). 'The Meaning and Measurement of Income Mobility'. *Journal of Economic Theory*, 71(2): 349-77.
- Fields, G.S., and E.A. Ok (1999). 'Measuring Movement of Incomes'. *Economica*, 66(264): 455-71.
- Friedman, M. (1962). *Capitalism and Freedom*. Chicago: Chicago University Press.
- Griffin, K., and R. Zhao (eds) (1993). *The Distribution of Income in China*. London: Macmillan Press.
- Gustafsson, B., S. Li, and T. Sicular (eds) (2008). *Inequality and Public Policy in China*. Cambridge: Cambridge University Press.
- Khor, N., and J. Pencavel (2010). 'Evolution of Income Mobility: People's Republic of China, 1991–2002'. In J. Zhuang (ed.), *Poverty, Inequality, and Inclusive Growth in Asia: Measurement, Policy Issues, and Country Studies*. London & New York: Anthem Press.
- Krueger, A.B. (2012). 'The Rise and Consequence of Inequality in the United States'. Available at: [http://www.whitehouse.gov/sites/default/files/krueger\\_cap\\_speech\\_final\\_remarks.pdf](http://www.whitehouse.gov/sites/default/files/krueger_cap_speech_final_remarks.pdf) (accessed 2 December 2014).
- Li, S., H. Sato, and T. Sicular (eds) (2013). *Rising Inequality in China: Challenges to a Harmonious Society*. New York: Cambridge University Press.
- Luo, C. (2009). 'Income Mobility in China: Urban and Rural'. *Finance & Economics*, 1: 35-44. (in Chinese).
- Markandya, A. (1984). 'The Welfare Measurement of Changes in Economic Mobility'. *Economica*, 51(204): 457-71.
- National Bureau of Statistics (NBS) (2012). *China Household Yearbook 2012*. Beijing: China Statistics Press.
- Ravallion, M., and S. Chen (2007). 'China's (Uneven) Progress against Poverty'. *Journal of Development Economics*, 82(1): 1-42.
- Riskin, C., R. Zhao, and S. Li (eds) (2001). *China's Retreat from Equality: Income Distribution and Economic Transition*. Armonk, NY: M.E. Sharpe Inc.
- Shi, X., A. Nuetah, and X. Xin (2010). 'Household Income Mobility in Rural China: 1989–2006'. *Economic Modelling*, 27(5): 1090-96.
- Shorrocks, A. (1978). 'Income Inequality and Income Mobility'. *Journal of Economic Theory*, 19(2): 376-93.
- Sun, W., J. Lu, and C. Bai (2007). 'An Analysis of Income Mobility in Rural China'. *Economic Research*, 8: 43-57 (in Chinese).

- Van Kerm, P. (2004). 'What Lies Behind Income Mobility? Reranking and Distributional Change in Belgium, Western Germany and the USA'. *Economica*, 71(282): 223-39.
- Wang, H. (2005). 'The Household Income Mobility and Its Equalizing Long-term Income in China'. *Economic Research*, 1: 56-66 (in Chinese).
- Wang, C., and Q. Hu (2008). 'Empirical Studies on Income Mobility in China: Based on Several Indices'. *Management World*, 10: 30-40 (in Chinese).
- Zhang, Q., J. Mi, and J. Huang (2007). 'Income Mobility and Income Distribution: Evidence from Rural China'. *Economic Research*, 11: 123-138 (in Chinese).
- Zhou, X. and F. Wang (2010). 'Income Mobility, Income Gap, and Social Welfare: Evidence from Urban and Rural China'. *Management World*, 5: 65-74 (in Chinese).