Effects of property Income on Income Distribution: An International Comparison

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Abstract: Using 2010 household survey data collected by China Family panel studies and Eurosystem Household Finance and Consumption Survey, the paper examines size, composition and its contribution to income inequality of property. We decompose income inequality into the contribution of each income component using the Gini coefficient decomposition method. We find the property has a rather high Gini coefficient, and its contribution to total income inequality is very significant, which requires careful attention. Different from some previous literatures, we include owner-occupied housing rents as part of property. We find the traditional property which excludes owner-occupied housing rents will make Gini coefficient larger. And after including owner-occupied housing rents, the Gini coefficient will fall to initial level, or even lower. Contrasted with Greece and Italy, we find similar results.

Key Words: Income Distribution; Property Income; owner-occupied housing rents

JEL Classification：C18, D33, E61

1. Introduction

Inequality in the income distribution is among the key issues that have been discussed for recent decades. The Gini coefficients released by the National Bureau of statistics show that Gini coefficients in China began to decline slightly in recent years, but many researchers pointed out that the income gap of wealth and property income was becoming bigger and bigger (Gustafsson, 2006; Li Shi, 2005; Wei Chi, 2012). "Chinese livelihood development report 2014" has pointed out that Chinese wealth inequality is significantly larger than that of income inequality and keeps rising. The wealth Gini coefficient was 0.45 in 1995, 0.55 in 2002, and it reached 0.73 in 2012. The top 1% wealthy households have more than a third of the country's wealth, the bottom 25% households have total only about 1%. Property income gap caused by wealth inequality is much bigger than wage income gap, and has a larger impact on total income gap. The rich families accumulate a large number housing asset and financial asset, the "Matthew effect" of property will further increase the income inequality. Therefore, property income gap is quite important for income gap.

There are many literatures about the wage income gap (Gustafsson, 2001; Appleton, 2005; Wei Chi, 2008), but few on property income gap. One main reason is the lack of micro survey data. Li Shi (2000) and Gustafsson (2006) estimated the distribution of wealth of urban residents and analyzed the relationship between income distribution and wealth distribution using the survey data of urbans in 1995. Li Shi (2005) found the wealth inequality gap was getting larger, which was mainly caused by a sharply widening gap between urban and rural. Chi Wei, Cai Xuxu (2012) found property income inequality was large, and was increasing over time.

In the paper, we use the database of China and Europe to analyze the property income inequality and its contribution to the total income inequality. First of all, considering the huge influence of housing asset on the property income, we analyzed the change of the property income gap, which based on whether including owner-occupied housing rent into property income. Second, we decompose the property income into four parts to identify which part is more important. Third, our paper also decomposes the total income into five parts, calculates the total Gini coefficients and the contribution rate for each part. Our results can be summarized as follows: The property income which do include owner-occupied housing rent can decrease the Gini coefficient, which is opposite to the effect of traditional property (without the owner-occupied housing rent). The concentration ratios of these two kinds property income is quite high, which means property income inequality is important for decreasing the income inequality.

The rest parts of the paper are organized as follows. Section 2 introduces the main concepts and methods; Section 3 presents our data sources and provides a detailed discussion of sample

processing; Section 4 presents empirical results; Section 5 concludes.

2. Main Concepts and methods

The total income defined in the paper includes wage income, transfer income, operational income and property income. Property income refers to the income generated by the assets of the household (such as house, land, deposits and securities), which including rents, interest and dividends income.

The owner-occupied housing rents refer to the virtual rents obtained by the occupied housing, which have been counted in the GDP in national accounting system. The statistics bureau added the owner-occupied housing rent into urban per-capita disposable income in 2012. But the literatures on income inequality including the owner-occupied housing rent are limited for lacking the micro datas. Li Shi, Luo Chuliang (2007) pointed out that the net disposable income was seriously underestimated if the owner-occupied housing rent is not contained. According to Khan and Riskin (2005) who used the CHIPS database, the owner-occupied housing rents accounted for 11.6% and 13.5% of the residents' income in 1995 and 2002 respectively. Obviously, it is necessary and meaningful to include the owner-occupied housing rent as a part of property income. Our paper calculate the mean value, the Gini coefficients of property income and its contribution rate for total income inequality before and after including the owner-occupied housing rent respectively.

The literatures on the owner-occupied housing rent usually take two conversion methods---“Market rent” method (Khan and Riskin (2005)) and “Opportunity cost” method (Li Shi(2013)). In the paper, we get the average rent per square meter in a region by using the rents the respondents answered to estimate the owner-occupied housing rent for every housing-owners. We use this method for two reasons. On one hand, our sample involves much more regions. Some regions are small towns and villages whose rental market is imperfect and the rent data is not available. On the other hand, in our database, the proportion of respondents who gave the rent data is high. So the sample rent data can reflect more truly local economic conditions. We compare the rent calculated by sample with the market rent data in same regions to test the accuracy of the data. For example, in Beijing, the monthly rent calculated by sample is 44.7 yuan per square meter, which is very close to 45.3 yuan per square meter from market rent database. Therefore, our method is reasonable.

In the paper, we decompose the Gini coefficients using the methods of Pyatt et.al. (1980). Li Shi (2005), Chi Wei and Cai Xuxu (2012) adopted similar methods on the decomposition of the financial assets and property income respectively.

We get the Gini coefficients using the expression

$$G(y)=\frac{2}{n\bar{y}}\mathrm{cov}(y,r(y)) \tag{1}$$

We sort the observation by income from low to high. y_i is the total income for the person i. Where i=1, 2, …, N. $G(y)$ is the Gini coefficient for total income. $\bar{y}$ is the mean for total income.

Suppose the total income contains m types of income, we denote y_{ik}, $k=1,\cdots,m$, then we have

$$y_i=\sum_{k=1}^{m}y_{ik} \tag{2}$$

$$\bar{y}=\sum_{k=1}^{m}\overline{y_k} \tag{3}$$

Where $\overline{y_k}$ represents the mean for the kth type, substitute it into (1), we get

$$G(y)=\frac{2}{n\bar{y}}\mathrm{cov}(\sum_{k=1}^{m}y_k,r(y))$$

Denote $\phi_k=\frac{\overline{y_k}}{\bar{y}}$, which is proportion for the kth type income in the total income. We have

$$G(y)=\sum_{k=1}^{m}\phi_k c(x_k,y) \tag{4}$$

Where $c(x_k,y)=\frac{2}{n\bar{y}_k}\mathrm{cov}(y_k,r(y))$, represents the concentration ratio of the kth type income.

From above analysis, we know the main difference between the concentration ratio of income and Gini coefficient is the sorting method. When calculating the Gini coefficient of the kth type income, we sort the observation from low to high by the kth type income. However, we sort the observation from low to high by its total income when calculating the concentration ratio of the kth type income. Therefore, concentration ratio of income can be seen as a more general Gini coefficient.

By equation (4), we denote the contribution ratio of the kth income as follow:

$$\omega_k=\frac{\phi_k C(x_k,y)}{G(y)} \tag{5}$$

3. Data

(1) Data sources

We use two micro family-level databases, Chinese Family Panel Studies (CFPS) and the Eurosystem Household Finance and Consumption Survey (HFCS).

CFPS is a nationwide comprehensive social tracking project carried out by Institute of Social Science Survey (ISSS). It focuses on Chinese economic and non-economic benefits, including

many topics such as economic activity, education attainment, family relationship, family dynamics, population migration and health, and so on. In 2010, CFPS takes the baseline survey in 25 provinces / city / autonomous regions involving a total of 162 district / county, 649 villages, 14960 households, 42590 family members.

HFCS is a decentralized survey effort of the Eurosystem in which each participating institution (national central banks and, in a few countries, national statistical institutes) finances and conducts its own wealth survey. The HFCS then provides the Eurosystem with harmonised micro-level data on euro area households' finances and consumption. The investigation began in late 2010 and ended at the beginning of 2011, and its data is released for the first time in April 2013. The sample size is very large, including 62,558 households and 154,247 individuals of 15 Eruo area countries. It contains micro-level information about household assets, liabilities, income, and indicators of consumption and credit constraints, etc. Because our main purpose is to study the effects of the owner-occupied housing rent on property income and income distribution, we use the data of Italy and Greece, who have the survey on the issue.

(2) Sample processing

We divide the total income into four parts, including property income, wage income, operating income and transfer income. The property income of CFPS mainly includes the rent income (rent of housing, land, other capital goods), financial market income (interest income, stocks and funds income), the owner-occupied housing rent, and the compensation from land requisition. The property income of HFCS data mainly includes rent (mainly for the rent of housing), financial market income (interest income, stocks and funds income) and the owner-occupied housing rent.

China is an urban-rural segmentation society and the property distribution difference is huge between urban and rural areas (Li Shi et al., 2005). So in the paper we not only analysis the total sample, but also compare urban and rural areas. Because we just have family property income data, we get the personal property income by dividing the family size. In the sample processing, the data of low income family is adjusted according to the 2010 towns and rural per capita minimum income level. Eventually, we get 10287 samples of Chinese family, 38193 personal samples, which includes 5575 urban household samples, 18766 urban personal samples, and 4712 rural household samples, 19427 rural personal samples. Besides, we get 2971 Greek family samples, 7740 Greek personal samples, 7951 Italian family samples of, 19836 Italian personal valid samples.

4. Empirical results

(1)Statistical analysis

Table 1 reports the statistical results for China, Greek and Italy. Comparing the urban and rural in China, the proportion of wage income in rural is 9.45% lower than that in urban, the proportion of operating income in rural is 24.83% higher than that in urban. The main reason for the difference is urban-rural segmentation causing the different income source. The transfer income in rural is just one third of that in urban, which is caused by rural deficient and imperfect health care, education and pension protection system. Li Shi et al. (2005) shows that the ratio of urban and rural per capita property is 3.6/1, and the difference has a tendency to expand. The main reason for the huge gap is the difference of property value and financial asset value. Urban residents have more financial investment channels and higher rental, so the proportion of property income in urban is significantly higher than that in rural. Due to average return of stock market is negative and the fund return was close to deposit interest in China in 2010, the proportion of property income in urban is just 6.46% higher than that of rural.

The proportion of wage income in Italy and Greece is close to that in China. However, the proportion of property income is significantly lower than that in China. Two possible reasons: On the one hand, the rate of housing ownership in Europe is lower， which means lower owner-occupied housing rent. On the other hand, consumption habit in Europe is different from China, the lower savings rate in Europe causing less accumulation of wealth, which results in less property income.

Table 2 reports the decomposition of property income. The property income increases sharply after including the owner-occupied housing rent. Specially, in China, income gained by the land expropriation is close in urban and in rural, which is about 17.5%.

(2)The effect of property income on Gini coefficient

Table 3 reports comparison among the three cases. The Gini coefficients will increase if we include the traditional property income (without the owner-occupied housing rent), don’t change or decreases if we include the owner-occupied housing rent. In a sense, increasing the rate of housing ownership can narrow the income gap.

(3)The decomposition of Gini coefficient

Table 4 reports the decomposition of Gini coefficient, i.e., concentration rate and contribution rate for each type income. The results reveal that income inequality of property is largest. The “Matthew Effect” will enlarge the inequality. This suggests the policy should focus on the property income. In contrast, the inequality of property in Italy and Greece is far lower than that in China.

In addition, the gap of transfer income in urban is larger than in rural. And the transfer system is more effective in Europe, which is important to decrease the income inequality. The situation will be better if improve the transfer system in China

Table 1 Decomposition of the total income

Regions	Total income	Wage income		Property income		Operational income		Transfer payment		Other income	
	Mean (Yuan)	Mean (Yuan)	Percentage	Mean (Yuan)	Percentage	Mean (Yuan)	Percentage	Mean (Yuan)	Percentage	Mean (Yuan)	Percentage
China	12,151.88	6,656.39	54.78%	2,512.59	20.68%	1,750.75	14.41%	1,232.16	10.14%	Null	Null
China Urban	16,866.50	9,746.15	57.78%	3,834.31	22.73%	1,098.13	6.51%	2,187.91	12.97%	Null	Null
China Rural	7,597.68	3,671.75	48.33%	1,235.83	16.27%	2,381.16	31.34%	308.93	4.07%	Null	Null
Greece	10,7716.03	73,313.49	68.06%	12,517.98	11.62%	1,513.12	1.40%	20,123.34	18.68%	248.09	0.23%
Italy	14,3115.32	77,745.82	54.32%	19,987.14	13.97%	Null	Null	44,644.11	31.19%	738.26	0.52%

Notes:1. Data about the operational income of Italy is null in the database, so it's null in the table；

2. The initial income data in Greece and Italy are in Euro, we transfer them into Yuan according to the Euro-Chinese yuan exchange rate in 2010.

Table2 Decomposition of the property income

Regions	Total property income	Rents		Asset income		Self-owned housing rents		Compensation for lands	
	Mean (Yuan)	Mean (Yuan)	Percentage	Mean (Yuan)	Percentage	Mean (Yuan)	Percentage	Mean (Yuan)	Percentage
China	2,512.59	255.20	10.16%	-47.47	-1.89%	1863.79	74.18%	441.06	17.55%
China Urban	3,834.31	342.61	8.94%	-105.34	-2.75%	2923.15	76.24%	673.89	17.58%
China Rural	1235.83	170.77	13.82%	8.44	0.68%	840.46	68.01%	216.16	17.49%
Greece	12517.98	808.06	6.46%	663.61	5.30%	11046.31	88.24%	——	——
Italy	19987.14	657.68	3.29%	334.85	1.68%	18994.60	95.03%	——	——

Notes:1. In Greece and Italy, there are no compensation for lands, so they’re null in the table；

2. The initial income data in Greece and Italy are in Euro, we transfer them into Yuan according to the Euro-Chinese yuan exchange rate in 2010.

Table 3 The Gini coefficients before and after the property income and the owner-occupied housing rents

Regions	Efficient samples	y_1	y_2	y_3
	38193	0.5143	0.5213	0.5140
China	18766	0.4944	0.4950	0.4790
China Urban	19427	0.4705	0.4839	0.4707
China Rural	7740	0.3715	0.3733	0.3560
Greece	19836	0.3720	0.3810	0.3739
Italy				

Note: y_1 , The Gini coefficients when neither of the property income and owner-occupied housing rents is included;

y_2 , The Gini coefficients when the property income in included, while owner-occupied housing rents not;

y_3 , The Gini coefficients when the property income and owner-occupied housing rents are both included.

Table 4 Decomposition of the total income Gini coefficients

Regions	owner-occupied housing rents	Gini coefficients	Wage income		Property income		Operational income		Transfer payments		Other income	
			Concent ratio	Contri ratio	Concent ratio	Contri ratio	Concent ratio	Contri ratio	Concent ratio	Contri ratio	Concent ratio	Contri ratio
China	No	0.5213	0.5143	0.6573	0.7826	0.0947	0.3838	0.1253	0.5344	0.1228	Null	Null
	YES	0.5140	0.5143	0.5521	0.5959	0.2397	0.3498	0.0980	0.5583	0.1101	Null	Null
China Urban	No	0.4950	0.4944	0.6770	0.7176	0.0947	0.5573	0.0887	0.4403	0.1396	Null	Null
	YES	0.4790	0.4944	0.5574	0.5216	0.2476	0.5278	0.0717	0.4551	0.1233	Null	Null
China Rural	No	0.4839	0.4705	0.5451	0.7998	0.0967	0.4545	0.3310	0.2877	0.0272	Null	Null
	YES	0.4707	0.4705	0.4875	0.5560	0.1921	0.4408	0.2935	0.3105	0.0268	Null	Null
Greece	No	0.3733	0.4066	0.8260	0.3715	0.0416	0.9333	0.0391	0.1747	0.0923	0.1476	0.0010
	YES	0.3560	0.3888	0.7433	0.3107	0.1100	0.9320	0.0368	0.2197	0.1092	0.1101	0.0007
Italy	No	0.3810	0.3951	0.6496	0.3720	0.0611	Null	Null	0.3228	0.2842	0.3266	0.0051
	YES	0.3739	0.3693	0.5364	0.4331	0.1861	Null	Null	0.3511	0.2731	0.3111	0.0043

5. Conclusion

This study has shown that the property income (without the owner-occupied housing rent) can enlarge the income inequality. But the inequality will decrease if including the owner-occupied housing rent. We find similar results in China, Italy and Greece. However, whether or not including the owner-occupied housing rent, property income inequality are quite high. We should focus on property income if we want to decrease Gini coefficient.

The paper also gives policy implications. Firstly, for traditional property income (without the owner-occupied housing rent), we can ease the income inequality through reforming the financial markets. The financial markets in China are imperfect. There are not so many investment channels and the investment threshold is rather high, so many low-income people have been left out of the financial market. It will be very helpful to establish Multi-level capital market. Secondly, the empirical results support that increasing the rate of housing ownership can narrow the income gap. So the government can reduce the gap through reforming the real estate market.

References:

[1] Appleton, S. , L. Song, and Q. Xia, 2005, “Has China crossed the river? The evolution of wage structure in urban China during reform and retrenchment”, Journal of Comparative Economics, Vol. 33, 644-663.

[2] Chi Wei, Cai Xuxu, 2012, “Capital income and income inequality in urban area of China”, The Journal of Quantitative & Technical Economics, No. 2, 100-112.

[3] Gustafsson, B. , and L. Shi, 2001, “The effects of transition on the distribution of income in China”, Economics of Transition, Vol. 9, 593-617.

[4] Gustafsson, B. , L. Shi, and W. Zhong, 2006, “The Distribution of Wealth in Urban China and in China as a Whole in 1995”, Review of Income and Wealth, Vol. 52, 173-188.

[5] Khan, A. R. , and C. Riskin, 2005, “China's household income and its distribution, 1995 and 2002”, The China Quarterly, Vol. 182, 356-384.

[6] Li Shi, Luo Chuliang, 2007, “Re-estimating the Income Gap between Urban and Rural Households in China”, Journal of Peking University(Philosophy and Social Sciences), Vol. 44 , No. 2, 111-120.

[7] Li Shi, Wei Sai, Ding Zhong, 2005, “Empirical Analysis on the Inequality and the Reason of China Residents’ Property Distribution”, Economic Research Journal, No.6, 4-16.

[8] Pyatt, G. , C. N. Chen, and J. Fei, 1980, “The distribution of income by factor components”, The quarterly journal of economics, Vol. 95, 451-473.

[9] Xie Yu, et, al, 2014, “China Family Panel Studies 2014”, Peking University Press.