The Effects of Financial Structure on Urban-Rural Income Gap Viewed through Economic Growth and Urbanization

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From the perspective of economic growth and urbanization, this paper proposes several hypotheses on how financial structure affects urban-rural income gap combining with the stylized facts of Chinese economy, and then uses a panel data of 29 provinces over 1996-2015 to conduct empirical analysis. Theoretical analysis shows that owing to the distinct availability of urban and rural residents for financial services, financial structure has a distinct impact on their income disparity. Meanwhile, through the function of credit allocation, financial structure plays important roles in the processes of economic growth and urbanization, and then has indirect effects. The results indicate that increasing the ratio of direct financing has a direct impact on shrinking the urban-rural income gap, and has an indirect impact through economic growth and urbanization. More importantly, the intermediary effect of urbanization is stronger than that of economic growth. Therefore, releasing the controls on financial markets helps shrink the urban-rural income gap in China.

Keywords: financial structure, urban-rural income gap, economic growth, urbanization

1. Introduction

Since the reform and opening up, China's economy has rapidly developed, and the annual growth rate of gross national products is up to 9%. However, with the improvement of people's living standard, the urban-rural income gap is expanding. Although from a statistical perspective, China's income inequality has been alleviated in recent years, it is still one of the countries that have the most serious income inequality in the world. Taking urban-rural income gap as the example, the ratio of per capita disposable income of urban residents to that of rural residents increased from 2.2 in 1990 to 3.3 in 2008, then slowly decreased to 2.7 in 2015. Once the availability of medical care and education for urban residents is taken into account, the urban-rural income gap would be greater (Li, 2003). In the process of economic growth, pursuing economic growth while disregarding the income inequality would result in the social

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unrest that Latin American countries once faced, which in turn affects the quantity and quality of economic growth (Lu and Chen, 2004) and results in the difficulties in crossing the medium income trap. In particular, China's economy has gradually entered the economic downturn in recent years, which is related to the urban-rural income gap (Chao and Shen, 2014). Since a large number of poor are mainly concentrated in rural areas, researching on the factors that contribute to urban-rural income gap and exploring solutions to narrowing the gap have great practical significance to alleviate urban-rural gap and poverty, as well as to enhance quality of economic growth.

In the background of financial marketization and globalization, the importance of financial structure on economic growth and income inequality is prominent, which attracts the attention of scholars (Levine, 2002; Kpodar and Singh, 2011; Johansson and Wang, 2014; Lin *et al*., 2009; Zhang and Liu, 2015; Liu and Liu, 2016). Since different financial system arrangements have different advantages and disadvantages in absorbing savings, capital allocation and risk management, the relative importance of banking and financing market in the financial system determines the availability of financial services in the real economy, which plays an important role in the industrial structure and economic growth (Lin *et al*., 2009). Further, the adjustment of industrial structure determines the demand of labor market in different levels, and the regional labor mobility has a significant impact on income distribution. At the same time, the "trickle down effect" in the process of economic development shows that the developed regions would benefit the poor area though consumption, employment and other aspects, and further narrow the gap between the rich and the poor (Aghion and Bolton, 1997).

On this account, this paper theoretically reviews the mechanism of financial structure affecting urban-rural income gap, and puts forward a series of hypotheses based on the current situation of China's development. Taking the provincial panel data in China from 1996 to 2015 as the sample, this paper empirically analyzes the relationship between financial structure and urban-rural income gap, and selectively analyzes the core mechanism—economic growth and urbanization. The first contribution of this paper is sorting out the mechanism of financial structure affecting urban-rural income gap in one country and one region, and constructing an analytical paradigm to investigate the relationship, which is different from the traditional perspective of financial development scale. Most existing literature holds that the retardation of urbanization process is the main factor of the expanding urban-rural income gap. However, research on the underlying factors is less. At the same time, the existing literature about the financial system and urban-rural income gap is mostly based on the perspective of financial development scale while ignoring the importance of structure feature. Moreover, the current literature on the impact of financial system on urban-rural income gap is focused on the overall impact while that on the analysis of influence channel is less. The second contribution of this

paper is systematically sorting out two channels of financial system affecting the urban-rural income gap from the perspective of financial structure, namely, economic growth and urbanization. Based on the current situation of China's development, this paper puts forward a series of hypotheses, and empirically tests with the provincial panel data using a variety of estimation methods to improve the reliability of estimated results. Since the expanding urban-rural income gap and irrational financial system have become the key factors that restrict the long-term development of Chinese economy, the third contribution is that conclusions in this paper has great reference value for the financial system reform in China's current supply-side structural reform.

2. Mechanism Analysis and Research Hypothesis

2.1. The Direct Impact of Financial Structure on Urban-Rural Income Gap

The direct effect of financial structure on urban-rural income gap may have three cases: significant positive effect, significant negative effect and no significant effect. The effect is determined by relative effect of the quality and type of financial services on the availability for urban and rural residents. If the availability of rural residents for financial resources were increasing, the urban-rural income gap would be narrowing. On the contrary, the urban-rural income gap would be continually expanding. Banking occupies the dominant position in China, and the financial market development is slow. The rich mainly engage in investment and financing through bank credit, and since the standard for mortgage and credit history is high, it is difficult for the poor to obtain financial services. At the same, the increasing relative proportion of financial markets would impose a strong impact on the bank loan, and the scale effect of financing in stock market would ease the financial constraint the real sector faces. Some modern sectors could get the financing support from the financial market, and government departments would have sufficient funds to support agricultural development, which enhances the probability that rural residents obtain the bank credit. In fact, the data of loan of financial institutions from 2009 to 2015 in the Wind database show that the proportion of related agriculture loans in regional GDP has increased from 1.5% in 2009 to 2.5% in 2015 along with the relative importance of financial market in the financial system. To some extent, the typical fact indicates that the development of financial market guides government supporting the agriculture development with bank credit, which means that financial market development has a substitution effect on the lending dependence of urban residents on bank credit.

Further, with more financial knowledge, urban residents' allocation of financial assets would exacerbate the inequality of property distribution between urban and rural residents (Li *et al*., 2005). However, since the investors in China's stock market

are mostly urban residents, the characteristics of low cash dividends and excessive speculation lead to the low investment return of listed companies, which has little impact on property income of urban residents. Zhang *et al*.(2004) finds that the investment performance of the circulating shareholders of listed companies in A share market is negative. Xin *et al.*(2007) finds that the rate of capital investment return of the listed companies in A share market is only 2.6% from 1999 to 2004, which is even lower than the capital cost. Yi and Song (2008) make the correlation analysis on the market value of circulation stock and fixed growth rate of resident's property income, and find that there is no significant correlation between these two variables. The above results show that, although the stock market has become an important investment channel for urban residents, the share of its contribution to the resident income is not obvious, and only a minority of crony institution and rent-seeking individual get the benefits. Therefore, in the premise of limited financial resources, increasing the proportion of direct financing is beneficial to the relative increasing of per capita income in rural areas, and further narrows the urban-rural income gap. With the above analysis, the following hypothesis is proposed in the paper:

Hypothesis 1: The increasing proportion of direct financing has a direct effect on narrowing urban-rural income gap.

2.2. The Indirect Impact of Financial Structure on Urban-Rural Income Gap

Economic growth and urbanization are two important factors alleviating the income inequality (Johansson and Wang, 2014), both of which are affected by the financial structure in one country. First, financial structure has an indirect effect on urban-rural income gap through economic growth. Although academics have not got the consensus on which financial structure is more conducive to the long-term economic growth, many empirical studies show that financial structure does have a significant impact on economic growth. Although China has the typical bank-oriented financial system, its financial system has gradually evolved from the unification situation before the reform and opening up to an omni-directional financial system with a variety of financial sector symbiotic omni-bearing. Especially in recent years, with the development of financial marketization and financial globalization, the financial system has been adjusted from "bank-oriented" to "market-oriented" to cope with the financial risks brought by the new normal economy, which promotes the rapid development of regional economy. The theory of "trickle down theory" supported by Aghion and Bolton (1997) suggests the regions and communities that are developed first benefit the poor through consumption, employment and promote its development and prosperity, which means the economic growth brought by the desirable financial structure would benefit the poor and alleviate the income inequality.

Second, financial structure has an indirect impact on urban-rural income inequality through urbanization. If the financial structure improves the market demand for low-tech workers through affecting the total output and credit allocation, the rural surplus labor force would gradually flow to the urban areas, and the income inequality would be narrowed through element reward equalization (Lu and Chen, 2004; Wan and Li, 2013). The increasing of urban labor force would increase the competition in labor market, and thereby reduces the wage level of urban residents. Meanwhile, the reduction of rural surplus labor would improve the productivity of rural labor, as well as the income of rural residents. Therefore, a desirable financial structure could accelerate the process of urbanization and reduce the urban-rural income inequality.

At present, economic development of China is at the stage of growth, and the essential endowment structure is characterized by the relative balance between labor force and capital. There are both labor-intensive industries and capital-intensive industries (Lin *et al*., 2009). At the same time, significant differences exist in the enterprise scale, and there are also entrepreneur risks, technological innovation risks and product innovation risks. Therefore, a reasonable financial system should be able to provide financial support for enterprises with different scales and risks, which results in the successively emerging of different financial system arrangements. Gong *et al.* (2014) points out that in the process that China transforms from the "middle-income country" to "high-income country", more and more Chinese industry would transform from "made in China" to "created by China". The real economic sector would have an increasing demand for financing in original innovation, and further achieve economic transformation and industrial upgrading. In other words, the financial system that matches the demand of China's real economic for finance should be gradually adjusted from "bank-oriented" to "market-oriented".[1] However, the existing financial system is unlikely to sustain the rapid economic development. On the one hand, the insufficient supply of capital in financial market leads to the bottlenecks of technological innovation enterprises with high risks in financing, which further results in the decreasing of technological invocation of the whole society, as well as the inhibition of rapid development of economy. On the other hand, the excessive supply of financial intermediaries leads to significant reduction in risk identification and guarantee limits for companies, which results in the funds flowing to the inefficient enterprises, as well as the low economic growth. In addition, labor force is abundant in China, especially in rural areas. Increasing the proportion of direct financing would not

[1] According to the theory of optimal financial structure, along with the improvement of economic development, the financial structure would transform from "bank-oriented" to "market-oriented" (Lin *et al*., 2013; Gong *et al*., 2014). In contrast, the 13th Five-Year Plan suggests to cultivate a transparent and healthy development of capital market, promote the trading system reform of stock and bond, and to enhance the proportion of direct financing to reduce leverage. It can be seen that to some extent, it's favorable to improve the relative importance of financial market in Chinese financial system, which indicates a desirable financial structure should be adjusted to raise the proportion of direct financing.

only be conductive to economic growth, but also to the decreasing of financing cost of modern production departments, such as the large and innovative enterprises located in urban areas. Then the marginal income of labor would be greatly enhanced, which increases the market demand for low-tech workers and promotes urbanization process. Therefore, increasing the proportion of direct financing would benefit the poor in the "trickle down effect" through the promotion of economic growth and accelerating of urbanization, which contributes to narrowing the urban-rural income gap. In particular, the indirect effect of financial structure on urban-rural income gap could be summed up as follows:

Hypothesis 2: Increasing the proportion of direct financing would narrow the urban-rural income gap through economic growth.

Hypothesis 3: Increasing the proportion of direct financing would narrow the urban-rural income gap through accelerating of urbanization.

3. Model Setting, Index Selection and Typical Facts

3.1. Model Setting and Estimation Method

Based on the above analysis, this paper further analyzes the relationship between financial structure and urban-rural income gap, and focuses on the mediating effect of economic growth and urbanization. There are two main methods testing the mediating effect. First is estimating step by step[1], such as Chen *et al.* (2008), Chen and Lin (2013). Second is the system estimation with the construction of simultaneous equations, such as Lu *et al.* (2005), Chao and Shen (2014). The former is easier to explain, but it ignores the possible correlations between error terms in the multiple regression equations. The latter could more systematically solve the complex relationship between these variables, but it is easily influenced by the equation form and estimation error. In consistent with Chen and Lin (2013), this paper uses the traditional stepwise regression method to test the transmission mechanism of financial structure affecting the urban-rural income gap, and in combination with the generalized moment estimation (GMM), the endogenous problems would be eliminated.

First, this paper constructs the benchmark panel model to test the comprehensive influence of financial structure on urban-rural income gap without considering the two factors of economic growth and urbanization:

$$URIG_{it} = C + \alpha FS_{it} + \sum_{j=1}^{5} \beta_j X_{it}^j + \mu_i + \gamma_t + \varepsilon_{it} \quad (1)$$

[1] On the applicability and validity of the step estimation method, see Wen *et al*. (2004) in detail.

In the formula, *URIG* is the explained variable, which represents the urban-rural income gap. *FS* is the financial structure, which reflects the relative importance of financial structure and financial intermediaries. *X* represents other control variables, which is used to eliminate the effect of area heterogeneity. μ_i and γ_t represent individual fixed effect and period fixed effect respectively, which depicts the characteristic of region and period that are difficult to be measured by index. ε is the error term, assumed to be the white noise sequence. According to the theoretical analysis, the greater the proportion of direct financing, the smaller the urban-rural income gap, which means the coefficient of α is negative.

Second, to explore the mediate role of economic growth and urbanization in the effect of financial structure on urban-rural income gap, the procedure of specific tests could be divided as follows: (1) Testing the effect of financial structure on economic growth and urbanization with the regional economic development *RI* and the urbanization *UD* as the explained variable, and financial structure as the core explanatory variables. (2) Testing the effect of economic growth and urbanization on urban-rural income gap with *URIG* as the explained variable, and the *RI*, *UD* as the core explanatory variables. The corresponding panel model is set as follows:

$$RI_{it} or UD_{it} = C + \eta FS_{it} + \sum_{j=1}^{5} \beta_j X_{it}^j + \mu_i + \gamma_t + \varepsilon_{it} \tag{2}$$

$$URIG_{it} = C + \delta RI_{it} or UD_{it} + \sum_{j=1}^{5} \beta_j X_{it}^j + \mu_i + \gamma_t + \varepsilon_{it} \tag{3}$$

If the second and the third hypothesis are correct, the coefficient of η is positive while δ is negative, and the corresponding mediating effect is $\eta\delta$. In other words, increasing the proportion of direct financing would promote the economic growth and urbanization, and further narrow the urban-rural income gap.

Finally, this paper constructs the following panel model to test the mediating effect of economic growth and urbanization, that is, whether the financial structure has direct effect on urban-rural income gap:

$$URIG_{it} = C + \vartheta FS_{it} + \lambda RI_{it} or UD_{it} + \sum_{j=1}^{5} \beta_j X_{it}^j + \mu_i + \gamma_t + \varepsilon_{it} \tag{4}$$

If the first hypothesis is correct, ϑ and λ should be significantly negative in the statistical sense, and the absolute value of ϑ should be less than that of α. This means that financial structure has both direct effect and indirect effect on the urban-rural income gap, and the economic growth and urbanization are the intermediary variables. If the estimation coefficient of financial structure were not significant, the economic

growth and urbanization would be considered as the complete medium variable.

For the above econometric models, the traditional least squares (OLS) could be used to estimate the parameters, and the transmission mechanism of financial structure on urban-rural income gap could be empirically analyzed. However, there are two main defects in the estimation of OLS: first is that the intrinsic nature of the model could not be overcome. Second is that the assumption that the error term satisfies the condition of same variance. On the one hand, two-way interaction between variables usually exists in the economic issue, and the important variables are also omitted, which causes the endogeneity. On the other hand, it is the imbalance of China's regional economic development that leads to the heterogeneity of provincial panel data (Yang and Wang, 2012). Therefore, this paper uses the GLS and dynamic GMM to estimate the model to eliminate the heteroscedasticity and endogeneity. It should be noted that tool variable is essential in the GMM model, and the lag phase of the main explanatory variable is selected as the corresponding tool variable and the control variable is regarded as the exogenous variable. At the same time, the first and second order autocorrelation tests of error items are conducted to verify the characteristic of normal distribution, and the Hansen statistic is used to identify the over-recognition of tool variable. This paper calculates the likelihood ratio, and uses the Hausman test to analyze the model setting. The results show the two-way fixed effect model is appropriate.

3.2. Index Selection and Data Source

In reference to the existing literature, the index selection and measurement method are shown in Table1. There are three methods measuring the urban-rural income gap: ratio of urban income to rural income, Gini coefficient, and Tel index. According to the theory of factor allocation, if the labor force is allocated effectively, the ratio of urban income to rural income would remain unchanged, the level of which is determined by the difference in education level or human capital (Vollrath, 2009). In consistence with Chen and Lin (2013), and Chen and Shen (2014), the urban-rural income gap is measured by the ratio of per capita disposable income of urban residents to that of rural residents. The greater the value is, the large the urban-rural income gap is. For financial structure, the ratio of total amount of transactions in the stock market to the balance of financial institution loans is used as the proxy indicators of financial structure and financial intermediaries respectively. The ratio of the former to the latter is used to measure the relative importance of financial market and financial intermediaries.[1] The greater the

[1] Considering that the market liquidity is measured by total trading volume of stock market, which is the main argument of "market-oriented" supporters. Therefore, this paper uses this index to measure the "degree of financial market activity". In practice, this paper also uses the total amount of capital in the stock market as the proxy index of scale of the financial market development, and there are little differences in the empirical conclusion.

value is, the closer the financial market is to the market-oriented financial system. The real per capita GDP is used to measure economic growth, and the greater the value is, the higher the economic development is in the growing stage. Different from the proportion of traditional urban population, this paper uses the ratio of non-agricultural population to the total population as the index of urbanization, which could effectively eliminate the underestimate of urbanization caused by some urban residents having no urban household registration (Lu and Chen, 2004).

Table 1. Variable Selection and Measuring Method

Variable	Symbol	Basic meaning	Measuring method
Explained variable	*URIG*	Urban-rural income gap (%)	The ratio of per capita disposable income of urban residents to that of rural residents
Core explanatory variable	*FS*	Financial structure (%)	The ratio of total amount of transactions in the stock market to the balance of financial institution loans
Mediator variable	*UD*	Urbanization (%)	The ratio of non-agricultural population to the total population
	RI	Real per capita GDP (Ten thousand yuan)	The ratio of GDP in the region to total population (converted to the price of 2000)
Control variable	*FD*	Financial scale (%)	(Total transaction value of stock market + loan balance of the financial institution)/GDP in the region
	TO	Opening up (%)	(Import value + export value)/GDP in the region
	GC	Government expenditure (%)	Fiscal expenditure in local government/GDP in the region
	SOE	Nationalization (%)	Number of workers in the state owned companies/ total number of workers
	EDU	Human capital (%)	Population with the diploma of high school and above/total population

According to Chen and Lin (2013), Chao and Shen (2014), the control variables mainly include: (1) The financial scale. It is measured by the ratio of total transaction value of stock market and loan balance of the financial institution to the GDP in region, which reflects the financial services that the real economy faces. Due to the typical characteristics of dual finance, the level of financial services in urban is higher than that in rural. Along with the rapid development of financial sector, as well as the competition among different sectors, financial services have extended from urban to rural area, which contributes to the narrowing urban-rural income gap. (2) Opening up. It is measured by the ratio of total amount of import and export accounts to GDP, which reflects the trade dependence of regional economy. If the related trade industries were mainly concentrated in the urban area, per capita disposable income of urban residents would be increasing. Therefore, opening up would expand the urban-rural income gap. (3) Government expenditure. It is measured by the ratio of fiscal expenditure of local government to the GDP in the region, which reflects the intervention by government in the real economy. Fiscal expenditure of local

government with the purpose of economic growth would contribute to urbanization, which means the higher the proportion of local fiscal expenditure, the more benefits that urban residents obtain, which results to the expending urban-rural income gap. (4) Nationalization. It is measured by the ratio of population in state-owned companies to total labor population, which reflects the nationalization of one region. As the focus in China's economic reform, the increasing of non-nationalization is caused by the non-nationalization of state-owned enterprises in urban areas, as well as the development of township enterprises in rural areas. Since the return of human capital in the non state-owned sector is higher than that in the state-owned sector, the non-nationalization of state-owned enterprises increases the income of urban residents, while the development of township enterprises in rural areas promotes improves the income of rural residents by absorbing surplus rural labor force. Therefore, it needs further empirical test to verify the effect of nationalization on urban-rural income gap. (5) Human capital. It is measured by the ratio of population with the diploma of high school and above to the total population, which reflects the level of human capital in the region. The high-quality talents were mainly concentrated in urban areas in the past. With the popularization of education, more and more rural residents could accept the higher education, which improves the level of human capital in rural areas, and narrows the urban-rural income gap.

This paper selects 29 provinces and regions in China as the sample, which contains 580 observations. Consistent with existing literature, Chongqing and Tibet are not included in the regression samples due to the late establishment of Chongqing municipality and to the lack of data in Tibet. At the same time, the relevant data of Chongqing is incorporated into Sichuan province. The transaction data of stock market is from the Wind database, and other basic variables is from the statistical yearbooks of each province, China Statistical Yearbook, China Population Yearbook and the historical data of China's gross domestic product (1952-2004). If there are differences concerning the same index from different data sources, annual statistical yearbook in each province is the criterion.

3.3. Analysis of a Typical Fact

Figure 1 reports the typical fact that financial structure affects the urban-rural income gap through economic growth and urbanization. It is not difficult to see that there is a significant positive correlation between financial structure and economic growth, as well as the urbanization. However, there is a significant negative correlation between economic growth and urban-rural income gap, as well as between urbanization and urban-rural income gap. The measurement of financial structure indicates that increasing direct financing is beneficial to the real per capita GDP and urbanization, which narrows the urban-rural income gap. However, the above

conclusion is only a preliminary characterization of the typical facts. In order to get more reliable conclusions, other factors should be taken into consideration and be incorporated to a unified analysis framework to conduct empirical test.

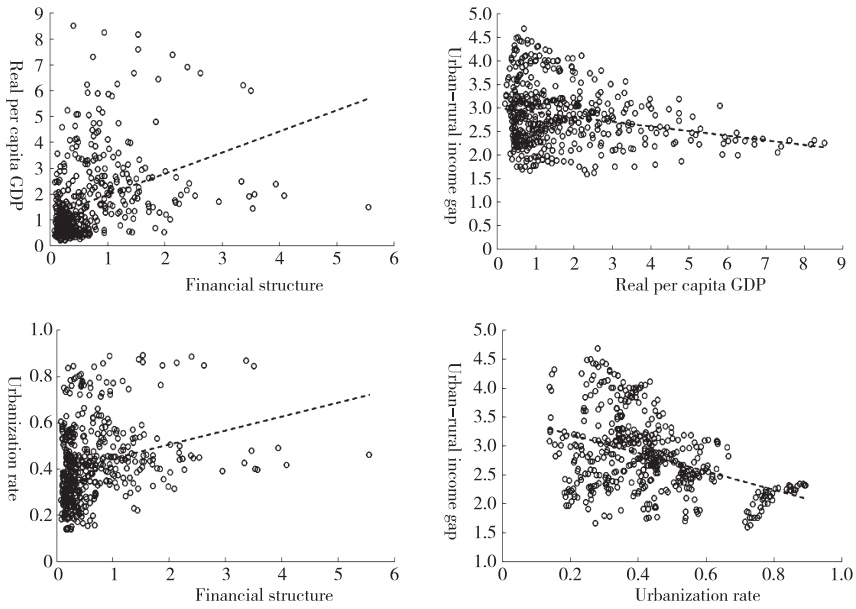

Figure 1. The Typical Fact of Financial Structure's Effect on Urban-Rural Income Gap

4. Empirical Analysis

4.1. Panel Unit Root Test and Panel Cointegration Test

Since the panel data used in this paper is composed of cross-sectional data and time series, unit root test and cointegration test are needed to eliminate the estimation bias caused by pseudo regression.[1] Three methods are used to test the stability of each variable: LLC, ADF and PP. The results show that, in addition to the inconsistency of the results of financial structure, unit root exists in the original sequence of other variables, and the first order difference is stationary sequence. Therefore, this paper also uses the other two methods to test the stability of financial structure: IPS and B-t, and the results show it is a first-order integral sequence. Therefore, all variables in the model are identical integral sequence, and the cointegration may exist in the linear combination, which needs further verified.

This paper further uses the Pedroni test and Kao test to verify the cointegration

[1] Limited to the length, the detailed results are not reported in the paper. The author can provide the results if the reader needs it.

relationship between variables. Taking the different slope coefficients, fixed effect coefficient and individual trend coefficient into account, Pedroni test calculates 7 statistics to test the stationarity of regression residuals of the model, which is favored by scholars. With model 4 as an example, Table 3 reports the corresponding test results, and shows that there are 4 statistics rejecting the original hypothesis that there is no cointegration relationship at the level of 1%, and the Kao test rejects the hypothesis. According to the theory of Pedroni (1999), the statistic characteristics of Panel ADF and Group ADF are relatively better in the small samples while that of Panel v and Panel rho are the worst, and other statistics are between them. It can be concluded that there is a stable long-term cointegration relationship between variables.

4.1.1. Comprehensive Effect of the Financial Structure on Urban-Rural Income Gap

This paper estimates model 1 with the methods of OLS, GLS and GMM to empirically analyze the comprehensive effect of financial structure on the urban-rural income gap. The results are shown in Table 2.

Table 2. The Comprehensive Effect of Financial Structure on Urban-Rural Income Gap

Variables	OLS	OLS	GLS	GLS	GMM	GMM
Constant	2.889*** (166.807)	2.783*** (37.075)	2.890*** (58.474)	2.719*** (35.579)	2.831*** (41.037)	2.786*** (22.601)
FS	–0.174*** (–3.151)	–0.139*** (–2.939)	–0.076** (–2.215)	–0.069*** (–3.093)	–0.650*** (–4.774)	–0.553*** (–5.976)
FD		–0.045 (–1.172)		–0.047** (–2.334)		–0.151*** (–2.979)
TO		–0.050 (–0.677)		–0.041 (–0.312)		0.297** (2.165)
GC		5.934*** (18.529)		4.981*** (15.827)		7.982*** (13.411)
SOE		–1.853*** (–7.055)		–1.572*** (–6.538)		–1.914*** (–4.809)
EDU		–3.362*** (–6.031)		–1.943*** (–8.372)		–3.559*** (–3.678)
Individual effect	Yes	Yes	Yes	Yes	Yes	Yes
Time effect	Yes	Yes	Yes	Yes	Yes	Yes
Sample	580	580	580	580	551	551
Adjusted R^2	0.934	0.937				
AR (2)					0.227	0.369
Hansen					0.569	0.411

Notes: The tool variables of GMM are the lag phase of the core explanatory variables. AR (2) and Hansen refersto the corresponding value of P, respectively. Values in the parentheses are t statistics. *, ** and *** represent the significant level at 10%, 5% and 1%, respectively; and the same below.

Table 2 shows that financial structure has a significant negative effect on the urban-rural income gap with different estimation methods and models, and the results are stable. The conclusion indicates increasing the proportion of direct financing is beneficial to narrowing the urban-rural income gap. In comparing the results of different estimation methods, the coefficients of some explanatory variables show the obvious differences. In other words, there may be a deviation with single estimation method, which requires a variety of estimation methods for cross validation. In this paper, the results estimated with the traditional OLS are regarded as the benchmark model, and the result analysis is based on the estimation of GLS and GMM.

As for the control variables, the financial structure has a significant effect on urban-rural income gap, which is in line with the theoretical expectation. Different from the theoretical analysis, the effect of opening up on urban-rural income gap is not significant (excluding GMM estimates). Although the industry of trade is mainly concentrated in the urban areas, its expansion has increased the market demand for low-tech labor, and has increased per capita income of urban and rural residents, which has no significant effect on urban-rural income gap. The coefficient of government expenditure is significantly positive while that of human capital is significantly negative, which is consistent with the theoretical expectation. The effect of nationalization on urban-rural income gap is significantly negative, which means the greater the proportion of state-owned enterprises, the smaller the urban-rural income gap is. The results indicate that in the process of Chines real economy reform, the non-nationalization of the state-owned enterprises in the urban areas is dominant, and the high level of nationalization means the growth rate of urban residents' income is lower than that of rural residents', which presents the negative effect of nationalization on urban-rural income gap.

Table 3. The Effect of Financial Structure on Economic Growth and Urbanization

Variables	Panel A: Financial structure and economic growth			Panel B: Financial structure and urbanization		
	OLS	GLS	GMM	OLS	GLS	GMM
Constant	–0.563***	0.107	–0.759**	0.056***	0.151***	–0.017
	(–3.541)	(0.842)	(–2.226)	(3.549)	(9.136)	(–0.572)
FS	0.285***	0.187***	1.380***	0.305***	0.021**	0.066***
	(2.932)	(3.626)	(5.375)	(3.467)	(2.253)	(4.108)
FD	0.227***	0.103**	0.681***	0.003	0.006	0.007
	(3.506)	(1.979)	(4.127)	(0.613)	(1.269)	(0.545)
TO	1.415***	1.285***	0.152**	0.162***	0.149***	0.091***
	(7.764)	(15.633)	(2.458)	(10.145)	(11.427)	(4.798)
GC	1.109	1.098**	3.332***	0.261***	0.295***	0.057
	(1.433)	(2.619)	(4.281)	(4.315)	(6.629)	(0.586)
SOE	–6.155***	–5.869***	–7.145***	0.019	–0.058	–0.123
	(–11.807)	(–17.578)	(–7.965)	(0.592)	(–1.171)	(–1.535)

Variables	Panel A: Financial structure and economic growth			Panel B: Financial structure and urbanization		
	OLS	GLS	GMM	OLS	GLS	GMM
EDU	14.136*** (10.929)	10.235*** (20.162)	18.807*** (7.241)	2.118*** (17.568)	1.332*** (18.058)	2.730*** (16.612)
Individual effect	Yes					
Time effect	Yes					
Sample	580	580	522	580	580	522
Adjusted R^2	0.941			0.892		
AR (2)			0.415			0.320
Hansen			0.708			0.596

4.1.2. The Indirect Effect of Financial Structure on Urban-Rural Income Gap

The above analysis depicts the comprehensive impact of financial structure on urban-rural income gap, which includes direct effect and indirect effect. Further, model 2 and model 3 are estimated to verify whether there is an indirect effect of financial structure on urban-rural income gap, i.e., whether economic growth and urbanization have the intermediary effect. Table3 shows the effect of financial structure on economic growth and urbanization, and Table4 shows the effect of economic growth and urbanization on urban-rural income gap.

Panel A in Table 3 shows that financial structure has a significant positive effect on the real per capita GDP in the different estimation methods with the significant level of 1%. These results show that the effect of financial structure on economic growth is moderate. This means improving the relative importance of the financial market in the financial system is conductive to the promotion of rapid development of regional economy. For other control variables, financial scale, opening up, government expenditure and human capital have a significant role in promoting economic growth, and the nationalization has a significant negative effect on regional economic development. Panel B in Table 3 shows that the financial structure has a significant positive effect on urbanization, which is moderate in different estimation methods. In other words, increasing the ratio of direct financing increases the demand for low-tech labor in urban areas, which promotes the urbanization. However, compared with the mean of regression coefficients, the effect of financial structure on economic growth is greater than that on urbanization, which is about 4.7 times of the latter. For control variables, financial scale and nationalization have no significant effect on urbanization while opening up, government expenditure and human capital have the positive effect.

Table 4. The Effect of Economic Growth and Urbanization on Urban-Rural Income Gap

Variables	Panel A: Economic growth and urban-rural income gap			Panel B: Urbanization and urban-rural income gap		
	OLS	GLS	GMM	OLS	GLS	GMM
Constant	2.771*** (36.648)	2.691*** (33.521)	2.752*** (30.945)	2.885*** (38.178)	2.719*** (29.266)	2.865*** (29.490)
RI	–0.085*** (–4.128)	–0.061*** (–3.569)	–0.068*** (–3.763)			
UD				–1.269*** (–5.451)	–0.657*** (–4.723)	–1.273*** (–3.594)
FD	–0.086*** (–3.375)	–0.056*** (–7.139)	–0.029*** (–6.811)	–0.107*** (–4.153)	–0.083*** (–8.077)	–0.315*** (–6.325)
TO	0.091 (1.365)	0.077 (1.430)	0.083 (1.429)	0.192** (2.437)	0.078 (1.354)	0.484*** (4.137)
GC	5.867*** (18.593)	4.622*** (16.148)	4.346*** (14.045)	6.121*** (19.319)	4.758*** (16.462)	7.682*** (15.163)
SOE	–2.269*** (–7.684)	–1.825*** (–8.037)	–2.055*** (–7.491)	–1.726*** (–6.785)	–1.319*** (–5.723)	–1.624*** (–4.238)
EDU	–2.123*** (–3.407)	–1.319*** (–7.176)	–1.162*** (–4.505)	–0.892 (–1.318)	–0.654*** (–3.968)	–0.715 (–0.639)
Individual effect	Yes	Yes	Yes	Yes	Yes	Yes
Time effect	Yes	Yes	Yes	Yes	Yes	Yes
Sample	580	580	522	580	580	522
Adjusted R^2	0.913			0.925		
AR(2)			0.279			0.314
Hansen			0.661			0.422

Further, results that estimated by different methods show economic growth and urbanization have the negative effect on urban-rural income gap. In combination with the estimated results of Table 5, the second and third hypotheses are confirmed. Compared with the means of regression coefficients, the narrowing effect of urbanization is more obvious than that of economic growth, which is 15 times that of latter. In combination with the estimated results of Table 5, the coefficient of financial structure that narrows urban-rural income gap through economic growth is 0.044 while that through urbanization is 0.139, which indicates the mediatory role of urbanization is stronger than that of economic growth.

4.1.3. Test of Intermediary Effect of Economic Growth and Urbanization

Taking the transmission mechanism of financial structure on urban-rural income

gap into account, financial structure, economic growth and urbanization are fit into one regression equation (model 4) to verify whether economic growth and urbanization are the complete intermediary variables. Table 5 shows the results estimated with three methods: OLS, GLS and GMM. The results show that when financial structure is incorporated into the regression model, the effects of economic growth and urbanization on urban-rural income gap are significantly negative, which is tested by 1% level of significance. In particular, financial structure and urban-rural income gap are significantly negatively correlated, slightly less than the regression coefficient in Table 2. These results fully show financial structure has significantly negative effect on urban-rural income gap. Therefore, the first hypothesis is verified, and economic growth and urbanization are the intermediary variables.

4.2. Robustness Test

4.2.1. Restructure of the Sample

In the process of economic development, emergency and macro policies may lead to the structural changes in the relationship between variables. For example, joining WTO in 2002 and the financial crisis in 2008 brought irreversible impacts on Chinese economy. Since this paper focuses on the long-term relationship between financial structure and urban-rural income gap, the five-year sliding data is used to test the robustness of empirical results to smooth the impact of financial structure on the urban-rural income gap.[1]

In consistence with the estimated results of the above three Tables, the test results based on the restructure samples show the significant negative effect of financial structure on urban-rural income gap. Meanwhile, there is a significant positive relationship between financial structure and real per capita GDP, as well as with urbanization. Moreover, both the real per capita GDP and urbanization have significantly negative effects on urban-rural income gap. The estimation results of the model that contains financial structure, economic growth and urbanization, the coefficients of economic growth and urbanization are significantly negative, which is less than that in Table 2. The results fully show financial structure has both significant direct and indirect impact on urban-rural income gap. Economic growth and urbanization are the intermediary variables rather than the root factors of urban-rural income gap. In particular, the mediating coefficient of urbanization and economic growth is –0.089 and –0.019 respectively, which means the intermediary effect of urbanization is stronger than that of economic growth.

[1] This paper uses the urban and rural income as the index of income gap between urban and rural areas, which has little differences in the empirical results.

Table 5. Intermediary Effect of Economic Growth and Urbanization

Variables	Panel A: Intermediary effect of economic growth			Panel B: Intermediary effect of urbanization		
	OLS	GLS	GMM	OLS	GLS	GMM
Constant	2. 585*** (36.136)	2.717*** (32.555)	2. 689*** (30.363)	2.8625*** (38.192)	2.737*** (28.583)	2.813*** (26.917)
FS	–0.124** (–2.363)	–0.052** (–2.273)	–0.047** (–2.029)	–0.104** (–2.218)	–0.049** (–1.991)	–0.046** (–1.986)
RI	–0.079** (–3.811)	–0.055*** (–3.179)	–0.059*** (–3.476)			
UD				–1.171*** (–4.652)	–0. 607*** (–4.075)	–0.627*** (–4.196)
FD	–0.023 (–0.618)	–0.040 (–1.613)	–0.027 (–1.042)	–0.044 (–1.229)	–0.047** (–2.768)	–0.042** (–2.574)
TO	0.051 (0.674)	0.035 (1.065)	0.048 (0.719)	0.143 (1.589)	0.038 (0.627)	0.065 (1.036)
GC	5.933*** (18.682)	4.559*** (15.470)	4.343*** (13.552)	6.137*** (19.486)	4.698*** (15.879)	4.411*** (13.950)
SOE	–2.316*** (–8.143)	–1.959*** (–8.138)	–2.089*** (–7.937)	–1.847*** (–7.201)	–1.434*** (–6.622)	–1.382*** (–5.446)
EDU	–2.213*** (–3.495)	–1.227*** (–6.626)	–1.069*** (–4.654)	–1.017** (–2.500)	–0.689*** (–3.865)	–0.715*** (–3.211)
Individual effect	Yes	Yes	Yes	Yes	Yes	Yes
Time effect	Yes	Yes	Yes	Yes	Yes	Yes
Sample	580	580	522	580	580	522
Adjusted R^2	0.628			0.639		
AR (2)			0.238			0.201
Hansen			0.567			0.399

4.2.2. Another Measurement of Urban-Rural Income Gap: Gini Coefficient

In reference to Qu and Du (2010), Wan and Li (2013), this paper uses Gini coefficient as the proxy of urban-rural income gap, and further empirically analyzes the transmission mechanism of financial structure on urban-rural income gap. Specifically, with the panel data of 23 provinces from 1996 to 2012 (excluding Tianjin, Jilin, Shandong, Hunan, Hainan, Chongqing, Yunnan and Tibet), this paper verifies the above conclusions from the perspective of overall level, urban areas and rural areas respectively.[1]

On the whole, financial structure has a significant negative impact on Gini coefficient, which is the same with urbanization. But the coefficient of economic

[1] Since the original data of 2012 is lacked, the sample is from 1996 to 2012. The data of Gini coefficients of residents from 1996 to 2010 is from Tian (2012) while that data from 2011 to 2012 is acquired from non-equal grouping method.

growth is not significant. From the perspective of urban and rural areas, the direct effect of financial structure on urban-rural income gap is heterogeneous in these two different models. Adding the variable of economic growth, the regression coefficient of financial structure and economic growth is significantly negative respectively in rural area while that is not significant in urban area. Adding the variable of urbanization, the regression coefficient of financial structure in urban area is significantly negative while that in rural area is not significant. However, the regression coefficient of urbanization in rural area is significantly negative while that is not significant in urban area. The results show that financial structure has a direct mitigating effect on urban-rural income gap, and the mediatory effect of urbanization is stronger than that of economic growth, which is also the same with that in rural area.

4.3. Analysis of Transmission Mechanism

In conclusion, increasing the ratio of direct financing could not only directly narrow the urban-rural income gap, but also indirectly narrow the gap through the mediatory effect of economic growth and urbanization. On the one hand, financial structure has the negative impact on urban-rural income gap, and increasing the ratio of direct financing improves the rural residents' availability for financial services, which results in the shrinking of urban-rural income gap. On the other hand, the "trickle down effect" of economic growth brought by financial structure could benefit rural residents. At the same time, financial structure has a significant positive effect on urbanization, which drives the surplus rural labor force effectively transferring to urban area due to the increasing demand for low-tech labor, and contributes to the relative improvement of per capita net income of rural residents, as well as the narrowing of urban-rural income gap. To sum up, financial structure has both direct and indirect effect on urban-rural income gap, and economic growth and urbanization are the two core transmission mechanisms. Therefore, taking the "market-oriented" financial structure as the guide, and releasing the controls on financial markets to improve the relative importance of the financial structure in the financial system could help shrink the urban-rural income gap in China.

It should be noted that urbanization and economic growth is conductive to narrow the urban-rural income gap seems to be contrary to reality. In fact, urban-rural income gap is determined by many factors. With the progress of urbanization and rapid growth of real economy, other factors may contribute to the expanding urban-rural income gap. As Chen and Lu (2004), Chen and Lin (2013) said, the expanding urban-rural income gap since the reform and opening up is related with some urban-biased economic and social polices, which includes the education funding policy, price regulation of agricultural and sideline products, unreasonable tax burden, the segmentation of urban

and rural labor markets, and discriminatory social welfare and social security policies. These discriminatory policies directly led to the expansion of urban-rural income gap. However, it is difficult to effectively control these factors in the econometric models. In other words, if the urban-biased policies have been eliminated, the urban-rural income gap would be narrowed with the improvement of urbanization and economic growth. The policy implication of empirical results in this paper is that although the "market-oriented" financial structure is conductive to shrink the urban-rural income gap, reasonable development strategy, economic and social policy could effectively alleviate the situation of expanding urban-rural income gap. In addition, this paper also finds government expenditure has intensified the continuous expansion of urban-rural income gap.

5. Conclusions

Along with the rapid economic growth, the continuous deterioration of income distribution is one of the important challenges that current Chinese economy faces. The relationship between financial structure and urban-rural income gap is not only related with the social problem of poor population, but also with the major strategic planning of financial system and the supply-side structural reform at current stage. However, most of existing literature has neglected the key role of financial system, especially the importance of financial structure.From the perspective of economic growth and urbanization, this paper explains the transmission mechanism of financial structure on urban-rural income gap, and empirically analyzes with the panel data. Relative theory indicates financial structure has both direct and indirect effect on urban-rural income gap. On the one hand, financial structure may affect the residents' availability of financial resources through expanding the credit channel and improving the efficiency of credit allocation, which directly affects the urban-rural income gap. On the other hand, financial structure has indirect effect on urban-rural income gap through economic growth and urbanization. First, reasonable financial structure improves the efficiency of capital investment and corporate governance by aggregating social funds and collecting business information and risk management. Moreover, reasonable financial structure could promote the economic growth through scale economy, and the "trickle down effect" could narrow the urban-rural income gap. Second, reasonable financial structure promotes the urbanization, which drives surplus rural labor to urban area, and narrows the urban-rural income gap.

On the basis of theoretical analysis, this paper constructs an analytical framework of the transmission mechanism of financial structure on urban-rural income gap to test a series of hypotheses put forward in combination with current situation of China. This paper uses the ratio of transaction value of stock market to the balance

loan of financial institutions and empirically verifies the hypotheses with the panel data from 1996 to 2015. As a whole, financial structure has a significantly negative effect on urban-rural income gap, and increasing the ratio of direct financing is conductive to narrow the urban-rural income gap. On the one hand, financial structure has the negative impact on urban-rural income gap by improving the rural residents' availability for financial services. On the other hand, financial structure has significant positive effects on economic growth and urbanization, and the effect of economic growth and urbanization on urban-rural income gap is significantly negative, which indicates financial structure has indirect negative effects on urban-rural income gap through economic growth and urbanization. Moreover, the mediatory effect of urbanization is stronger than that of economic growth. This paper also finds the government expenditure would expand the urban-rural income gap while nationalization and education would be conductive to narrow the urban-rural income gap. In other words, the promotion of demand for low-tech labor by the state-owned enterprises is stronger than its positive effect of improving urban residents' income. Therefore, the policy of non-nationalization could not effectively narrow the urban-rural income gap, adjusting the structure and direction of government expenditure is advisable, especially applying the fiscal expenditure to the agriculture and education in the rural area.

Therefore, economic growth and urbanization are not the fundamental factors for the continuous expansion of urban-rural income gap, and it is the unreasonable financial structure that leads to the urban-rural income gap. To narrow the urban-rural income gap, financial structure reform is needed to effectively promote the economic growth and urbanization. The empirical results show that increasing the relative importance of financial market in the financial system is the effective mean to control the expansion of urban-rural income gap. First, constructing the financial system with the market as the dominant player, promoting the financial system reform and liberalizing the regulation of financial market, and playing the positive role of financial market on economic growth and urbanization. Second, establishing the diversified financial service system, supplying various types of financial services and financial resources to increase the availability of low-income residents. Third, establishing the flexible financial system and credit system to make the financial capital freely flow in the financial market and financial intermediaries, and to make full use of the resource allocation of financial system. Fourth, speeding up the reform of urban sector, gradually cancelling the urban-biased economic policy and focusing on increasing support for agriculture and education. It should be noted that current financial system with banking in dominance should be reformed in an orderly way rather than cutting it overnight.

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