Volume 32, Issue 2

Financial Development and Rural-Urban Inequality: Evidence from China

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Abstract

This paper assesses the impacts of financial development on rural-urban inequality with the panel data of China's 31 provinces. We find that credit service would deteriorate income distribution if it is only available to the rich people. But when the credit coverage becomes wider, finance may help to reduce income inequality. In addition, finance plays different roles at different stages of economic development. At the starting stage of economic growth, when physical capital is the engine of economic development, financial development could reduce income inequality. But in a mature economy, where the return to human capital is much higher, financial development may increase income inequality.

1. Introduction

China has experienced obvious increase of income inequality since the *Reform and Openness*, with the Gini Index having reached 0.458 in 2010. Many economists have devoted their efforts to finding the reasons of the unequal income distribution. Some have turned their attention to the influence of financial development. Up to now the relationship between finance and income inequality has been studied from different perspectives, and opinions may be classified as three classes.

A popular view is that financial development may primarily benefit the rich and deteriorate income inequality. Since the poor do not have enough collateral, it is difficult for them to get loans and other financial services due to adverse selection and moral hazard problems. Consequently financial institutions mainly channel money to the rich and the well-connected (Rajan and Zingales, 2003). Therefore income gap is enlarged by the financial development.

Other theories suggest that financial development promotes economic growth and decrease inequality. From the household perspective, financial development might contribute to the human capital accumulation of the poor. If financial help is unavailable when the poor households suffer from negative income shocks, they may take their kids out of school (Jacoby and Skoufias, 1997; Baland and Robinson, 1998). Therefore the development of financial market and the wider access to credit will help those poor households to deal with adverse shocks and to smooth consumption, so as to accumulate human capital. Demirguc-Kunt and Levine (2009) argue that a less developed financial market increases the degree to which the level of assets (physical capital) influences the investment opportunities and returns. If an individual's investment opportunities are constrained by parental wealth, lower levels of financial market can foster persistent inequality. Another perspective concerns firms and employment. Financial development may improve market competition and reduce discrimination and consequently benefits the poor (Black and Strahan, 2002; Kerr and Nanda, 2007; Levine, Levkov and Rubinstein, 2009). What is more important is that the financial market development can disproportionately benefit the small and medium enterprises (SMEs), which employ much more labor force than those large companies. The growth of SMEs may result in growing demand for less skilled workers. As a result, the job opportunities and wages of those workers will increase (Banerjee and Newman, 1993; Beck et al, 2008).

Some economists, like Greenwood and Jovanovic (1990) and Galor and Moav (2004), suggest that different impacts may dominate at different levels of economic development. And the influence of financial development on inequality may be nonlinear.

While the existing studies provide evidence that finance has important relation with income distribution, they hold different views on whether financial development increases or decreases income inequality. It is straightforward to proceed further and investigate empirically how financial development could influence income distribution. This paper aims to implement an empirical test with the dada of China. It is found that the impacts of financial development on income inequality change with economic growth and financial market. The remainder of the paper is organized as follows. Section 2 describes the data and empirical methodology in detail. The methodology in this paper takes into account of all of the three classes of theories discussed above. Section 3 presents the estimation results and Section 4 summarize the conclusions reached.

2. Data and Methodology

2.1 The Data

We construct a panel of China's 31 provinces to study the impacts of finance on rural-urban inequality. Most of the data are collected from the Statistic Yearbook of each province. Since China's National Accounting System was established in 1978, the data quality of the beginning years may be not very high and there are many missing values in the data from 1978 to 1980. Therefore we decide to use the data from 1981 to 2008. In 1984 the National Bureau of Statistics of China (NBSC) established Urban Survey Teams and Rural Survey Teams in every province and county of China so as to provide better data. In order to test the robustness of the results we will estimate with the data from 1985 to 2008 and compare with the regression results of the data from 1981 to 2008.

The dependent variable GAP is defined as the ratio of the average income of urban residents to the average income of rural residents. But we should note that the statistical approach of the urban resident income is different from that of the rural resident income. The urban resident income is the *disposable income* of an urban resident. Disposable income = gross income - taxes - expenditure for social security – necessities. But the rural resident income is the *net income* of a rural resident, a part of which must be invested in agriculture production. Consequently GAP_{it} underestimates the rural-urban inequality. But it is not an important issue for our research, because we focus on the dynamics of the rural-urban inequality. As long as the statistical approaches keep stable, we are able to obtain credible conclusions.

With regard to the measurement of financial development, some researchers use M2 as a share of GDP. But M2 does not reflect a key function of financial intermediaries that is the channeling of society's savings to investment. Other researchers, like Levin (1993), use the ratio of commercial bank assets to commercial bank plus central bank assets. However this indicator ignores the fact that commercial banks are not the only financial institutions intermediating society's resources. We follow Beck, Demirguc-Kunt and Levine (2007) to use the ratio of loans to GDP in the present study. Another indicator is the ratio of the sum of loans and deposits to GDP, which is used by Xu (2010). It reflects the total amount of financial resources relative to the economic aggregate. Although the economic sense is not as good as that of the former indicator, we can use it to test the robustness of the results.

$$FD1 = \frac{Loans}{GDP}$$

$$FD2 = \frac{Loans + Deposits}{GDP}$$

The variable of GOV is employed as a control variable, which measures the extent of local government intervention in the economy. It is defined as the ratio of fiscal revenue to GDP or the ratio of fiscal expenditure to GDP. If China's local governments could function well in transfer payment, the variable of GOV should have a negative impact on rural-urban inequality. In reality, however, local governments in China pay most of their attention to the construction of infrastructure facilities and are not interested in transfer payment. In addition, the local governments often channel rural resources, such as lands, forests and mineral resources, to urban sectors with paying pretty low prices to farmers. Moreover, with regard to the corruption problem in China, rural-urban inequality may be enlarged by more government intervention.

$$GOV1 = \frac{Fiscal\ Revenue}{GDP}$$

$$GOV2 = \frac{Fiscal\ Expenditure}{GDP}$$

DEV is another control variable that reflects the employment structure and grasps the labor migration effects. It is defined as the proportion of labor force employed by the secondary sector and the tertiary sector. Actually the proper indicator should be urbanization rate, which is the ratio of urban population to total population. In China, however, the urbanization rate is an ambiguous concept because of the Household Registration System (*Hukou System*). Sometimes a farmer is defined as an urban resident because he/she lives in a suburb, which belongs to the urban area according to the *Hukou System*. DEV is a better indicator than urbanization rate in this research because it is defined according to real economic activities.

Table1. Summary Statistics

Variable	Observation	Mean	Standard Deviation	Minimum Value	Maximum Value
GAP	859	2.55	0.87	0.97	14.92
$FD1$	868	0.89	0.29	0.20	2.25
$FD2$	868	1.86	0.74	0.71	5.94
$PCGDP$	868	0.69	0.93	0.02	7.31
$GOV1$	864	0.09	0.05	-0.08	0.54
$GOV2$	864	0.15	0.10	0.05	0.96
DEV	858	0.46	0.18	0.16	0.95

Note: The unit of $PCGDP$ is 10000Yuan (about 1587 U.S. dollars). Yuan is China's currency unit (1 US dollar= 6.3 Yuan, 100 Yuan=15.86 U.S. dollars).

2.2 The Methodology

We specify the model in the following form.

$$GAP_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it}^2 + \beta_3 PCGDP_{it} + \beta_4 PCGDP_{it}^2 + \beta_5 PCGDP_{it} * FD_{it}$$

$$+\beta_6 PCGDP_{it}^2 * FD_{it} + \beta_7 GOV_{it} + \beta_8 DEV_{it} + \varepsilon_{it}$$

As a dependent variable, GAP_{it} measures the extent of the rural-urban inequality.

FD_{it} represents the level of financial development defined as FD1 or FD2. FD_{it}^2 is the square term of FD_{it}. As indicated by the existing literature, if financial services are only available to the rich people, financial institutions may channel resources from the poor to the rich and consequently increase income inequality. But if financial services could cover most of the residents, this problem is not serious. Therefore the impacts of finance on inequality may present a reverse-U type dynamics, which means when the value of FD is small, the influence of finance on inequality is positive but the influence will change to be negative when the value of FD increases. Concretely speaking, β_1 should be positive and β_2 should be negative.

$PCGDP_{it}$ represents per-capita GDP. $PCGDP_{it}^2$ is the square of it, which is designed to test whether rural-urban inequality presents a reverse-U type dynamics as the per-capita GDP increases. The reverse-U hypothesis, developed by Kuznets (1955) says that there is a natural cycle of income inequality driven by market forces which at first increases inequality, and then decreases it after a certain average income is attained.

It is necessary to give more explanation on the interaction terms of $PCGDP_{it} * FD_{it}$ and $PCGDP_{it}^2 * FD_{it}$. They are designed to test the shift of financial impact as the economy

develops. We expect the coefficient of $PCGDP_{it} * FD_{it}$ (β_5) to be negative and the coefficient of $PCGDP_{it}^2 * FD_{it}$ (β_6) to be positive. In other words, as the economy grows, the marginal impact of financial development on inequality may be negative at the starting period of economic growth; however it may turn to be positive in the mature stage of economic growth. According to Galor and Moav (2004), human capital accumulation will at last replace physical capital accumulation as a prime engine of growth along the process of development. At the starting stage of development, physical capital is more important than human capital and its return is much higher than that of human capital. Therefore the people who can get credit and accumulate physical capital would enjoy a good income. In this case, if credit service could cover more people, income inequality might be reduced. But at the developed stage of an economy, the return of human capital is much higher than that of physical capital. Some people could not earn a lot of money even they had access to credit, because they do not have enough natural endowments or other kinds of human capital. Credit only helps those who are endowed with higher ability. The implication is that more credit will not increase the income of the people with low ability, but only improve the income of those of talent. Now we may conclude that at the beginning stage of economic growth, financial development could decrease income inequality, but at the mature stage of an economy, when human capital is more important than physical capital, financial development may increase income inequality.

Before estimating the model, unit root test and cointegration test are implemented. With Levin-Lin-Chu unit root test for panel data we find that all of the variables are first order stationary. In addition, the panel data cointegration method, developed by Persyn and Westerlund (2008), proves the long-term stable relationship between rural-urban inequality and financial development, per-capita GDP, government intervention and the employment structure.

Another issue concerns the possible causal links from rural-urban inequality to financial development. According to Beck, Demirguc-Kunt and Levine (2007), reductions in income inequality may stimulate political pressures to create more efficient financial systems that fund projects based on market criteria instead of political connections. This is what has been happening in China. In order to deal with the endogenous problem resulted from the reverse causality, we use Instrumental Variable estimation. The ratio of fixed capital investment to GDP and the ratio of national deposits to GDP are employed as instruments. Fixed capital investment is dependent on the loans from commercial banks and other financial institutions, and it is able to influence economic growth, the income of rural residents and urban residents. But it is not obviously influenced by rural-urban income distribution. The reason why we choose deposit as an instrument for financial development is that deposit is the base of loans but seems not to be significantly influenced by rural-urban inequality. 2SLS is taken for the IV estimation.

We are also worried about the reverse causality from rural-urban inequality to per-capita GDP. Because of the serious rural poverty, China has to depend on export to develop her economy. Such a kind of economy, however, is quite fragile to international economic crisis. Since sub-prime crisis of 2008, numerous factories in China's coastal areas have been out of business. The government of China began to stress the importance of the rural economy and the necessity of a balanced economic development. If China's rural area had been developed well, the domestic demand would have helped China's economy to grow better. In other words, rural poverty may has negative impacts on economic development. We use the lagged value of per-capita GDP as an instrument in order to deal with this endogenous problem.

Since the panel data cover all of the 31 continent provinces of China, Fixed Effect model should be a proper choice. It enables us to control for unobserved province-specific effects. But Pooled OLS method and Random Effect model are also employed so as to test the robustness. We also use substitutive indicators, such as *FD*1 and *FD*2, *GOV*1 and *GOV*1 to test the robustness. As mentioned above, we also use the data from 1985 to 2008 to implement robustness test because the data during this period are considered to have higher quality. (We place the results of these data in the Appendix due to the limited space.)

3. Empirical Results

The basic regression results are shown in Table2. We can observe that financial development has significant influence on China's rural-urban inequality. And the economic effects are substantial. A reverse-U type dynamics of the impacts of finance is proved by the positive coefficients of *FD* and the negative coefficients of *FD-Squared*. The coefficients of *FD* are about three times of the coefficients of *FD-Squared*. It means that when credit is more than three times of GDP it will certainly decrease the rural-urban inequality. Since China's credit is 1.01 times of GDP in 2008, we have to consider the interaction terms in order to check the overall effects of finance.

The results of the interaction terms are in accord with our expectations with negative coefficients of *PCGDP*FD* and positive coefficients of *PCGDP-Squared*FD*. It proves that at the development stage dominated by physical capital, a wider coverage of credit service is helpful in restraining income inequality. But when human capital becomes the engine of economic growth, credit may deteriorate the income distribution. The results of specification (1) imply that when per-capita GDP is more than 41800 Yuan (=10000*0.852/0.204, about 6635 U.S. dollars) credit is more likely to increase China's rural-urban income inequality.

With consideration to all of the above factors, we can check the overall effects of finance. Take the case of China, in 2008 *FD1* is 1.01, *PCGDP* equals 2.4 (according to the Statistic Yearbook of China), then based on the results of specification (1) the marginal effect of finance on rural-urban inequality is 1.35. It means that finance is now increasing the rural-urban inequality. But it is insufficient to judge whether China should reduce the credit scale. Before saying anything about China's present financial policies, a structural analysis is necessary. According to *FD* and *FD-Squared* more credit may enable the rich to control more resources, but *PCGDP*FD* and *PCGDP-Squared*FD* indicate that if more loans are available, more people could become rich and consequently reduce the income inequality. The key is the coefficient of *FD-Squared*. The negative coefficient means that if more credit could be provided, finance would do less harm to income distribution. To sum up, although finance is increasing China's rural-urban inequality, more credit should be supplied. The conclusion seems to be ridiculous, but it is consistent with the history of developed countries.

Government intervention has a positive relationship with rural-urban inequality, which confirms our hypothesis that government distribution is less fair than market distribution in China. The negative coefficients of DEV suggest that the development of the secondary sector and the tertiary sector could help reduce rural-urban inequality. Although the coefficients are not significant when Fixed Effect model is applied, the signs are consistently negative.

The results of IV estimation about per-capita GDP are presented in Table3. The results are in consistent with those shown in Table2. Only the coefficients of *GOV* are out of our expectations. Their signs become negative in the estimation of (1) of Table3 and in the estimation of (1) and (9) of Appendix2. But all of those coefficients are not significant.

According to our explanation in Section 2.1, if the government functions well in transfer payment, there is possibility of negative coefficient of *GOV*. Therefore the IV results are not contradictory to our main conclusions achieved above.

The estimation results using instruments of financial development are shown in Table4. Most of the results are consistent with the former estimations and support our main conclusions. The only difference is that the variable of *FD-Squared* becomes insignificant and the signs become positive. But with the data from 1985 to 2008, some estimated coefficients of this variable become negative again (see Appendix3). Although we cannot say much about this variable, the other conclusions have been proved to be credible.

Other robustness tests are implemented with the data from 1985 to 2008, and the estimation results are presented in the appendixes. Most of the conclusions obtained above seem to be robust. The impacts of financial development on rural-urban inequality are proved to take a reverse-U type dynamics, and the hypothesis of Kuznets (1955) seems to be valid. With regard to the interaction terms, the coefficients of *PCGDP-Squared*FD* are still positive, the coefficients of *PCGDP*FD* are consistently negative. More government intervention would increase rural-urban inequality. The coefficients of *DEV* are still insignificant under the Fixed Effect estimation but the magnitudes become larger.

Table2. The Rural-Urban Income Inequality and Financial Development: General Estimation

Independents	Dependent Variable: Gap								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FD	3.073***	2.967***	1.035***	0.900***	4.060***	4.090***	1.739***	1.563***	3.532*
	(4.86)	(4.58)	(4.15)	(4.03)	(9.99)	(10.67)	(10.94)	(9.34)	(5.96)
FD-Squared	-0.849**	-0.795**	-0.0522	-0.0292	-1.284***	-1.338***	-0.224***	-0.193***	-0.973*
	(-3.24)	(-2.91)	(-0.81)	(-0.49)	(-5.84)	(-6.47)	(-4.79)	(-4.13)	(-3.85)
PCGDP*FD	-0.852***	-0.877***	-0.285*	-0.311*	-1.107***	-1.076***	-0.232**	-0.254**	-1.215*
	(-3.73)	(-3.99)	(-2.35)	(-2.64)	(-7.23)	(-7.50)	(-2.84)	(-3.13)	(-5.24)
PCGDP-Squared*FD	0.204***	0.202***	0.0471**	0.0488**	0.293***	0.281***	0.0616***	0.0619***	0.275*
	(3.74)	(3.99)	(3.02)	(3.48)	(7.56)	(7.95)	(5.95)	(6.17)	(4.77)
PCGDP	1.642***	1.601***	1.017***	1.015***	2.389***	2.250***	1.384***	1.364***	2.246*
	(5.92)	(6.00)	(3.81)	(4.09)	(13.98)	(15.20)	(9.47)	(9.77)	(8.16)
PCGDP-Squared	-0.354***	-0.341***	-0.179***	-0.173***	-0.530***	-0.503***	-0.298***	-0.286***	-0.468*
	(-4.84)	(-5.02)	(-3.93)	(-4.39)	(-9.23)	(-9.83)	(-8.59)	(-9.09)	(-6.24)
GOV	1.140	0.716	1.844*	0.485	0.348	1.832***	0.890**	0.849**	0.284
	(1.87)	(1.68)	(2.39)	(1.04)	(0.96)	(8.33)	(2.71)	(3.14)	(0.61)
DEV	-0.198	-0.219	-0.110	-0.0589	-4.159***	-3.580***	-4.045***	-3.617***	-2.425*
	(-0.39)	(-0.43)	(-0.26)	(-0.14)	(-28.29)	(-29.78)	(-29.71)	(-27.39)	(-4.70)
Constant	0.160	0.246	0.545	0.807**	1.341***	0.898***	1.602***	1.594***	0.857*
	(0.42)	(0.78)	(1.69)	(3.37)	(7.20)	(5.58)	(11.08)	(12.78)	(3.65)
Method	FE	FE	FE	FE	POLS	POLS	POLS	POLS	RE
R-square	0.426	0.424	0.434	0.426	0.476	0.518	0.527	0.533	0.401
N	845	845	845	845	845	845	845	845	845

*, ** and ***denotes the significance at the 10, 5 and 1percent level respectively. Heteroskedasticity robust t-statistics are in parentheses. Spe
definition of *FD1* to represent financial development, the other specifications use *FD2*, a less satisfying indicator, to test the robustness of the
model with heteroskedasticity-consistent t-statistics. Specifications (5)-(8) are estimated using Pooled OLS with heteroskedasticity-consist
estimated with Random Effect model. The indicator of *GOV1* is used in specifications of odd number and *GOV2* is used in even number specifica

Table3. The Rural-Urban Income Inequality and Financial Development: IV Estimation about Per-cap

Independents	Dependent Variable: Gap								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FD	3.847***	3.796***	1.212***	1.075***	4.673***	4.901***	1.920***	1.738***	4.261**
	(5.97)	(5.65)	(4.20)	(4.07)	(10.31)	(11.83)	(11.16)	(9.66)	(7.12)
FD-Squared	-1.122***	-1.063**	-0.0766	-0.0501	-1.528***	-1.664***	-0.260***	-0.227***	-1.221**
	(-4.03)	(-3.54)	(-0.89)	(-0.60)	(-6.30)	(-7.57)	(-5.18)	(-4.55)	(-4.66)
PCGDP*FD	-0.828**	-0.884**	-0.261	-0.286	-1.095***	-1.116***	-0.208*	-0.232**	-1.241**
	(-3.08)	(-3.26)	(-1.82)	(-2.03)	(-6.21)	(-6.35)	(-2.42)	(-2.72)	(-4.59)
PCGDP-Squared*FD	0.192**	0.193**	0.0432*	0.0441**	0.284***	0.284***	0.0607***	0.0605***	0.272**
	(3.43)	(3.54)	(2.64)	(2.95)	(7.46)	(7.68)	(5.74)	(5.86)	(4.55)
PCGDP	1.535***	1.521***	0.889**	0.882**	2.299***	2.209***	1.290***	1.272***	2.195**
	(5.02)	(4.99)	(2.94)	(3.05)	(13.41)	(14.12)	(8.13)	(8.40)	(7.63)
PCGDP-Squared	-0.322***	-0.310***	-0.158**	-0.149***	-0.499***	-0.481***	-0.288***	-0.274***	-0.443**
	(-4.64)	(-4.73)	(-3.42)	(-3.65)	(-9.99)	(-10.69)	(-8.95)	(-9.42)	(-6.30)
GOV	0.713	1.109*	1.606	0.485	0.0920	1.841***	0.878*	0.758*	-0.0664
	(1.20)	(2.54)	(1.84)	(1.02)	(0.23)	(8.54)	(2.34)	(2.57)	(-0.15)
DEV	-0.279	-0.390	-0.214	-0.156	-4.295***	-3.743***	-4.170***	-3.775***	-2.594**
	(-0.53)	(-0.71)	(-0.48)	(-0.36)	(-28.65)	(-29.86)	(-30.40)	(-26.86)	(-5.15)
Constant	-0.197	-0.222	0.412	0.639*	1.112***	0.550**	1.480***	1.501***	0.551*
	(-0.50)	(-0.68)	(1.21)	(2.45)	(5.33)	(3.13)	(9.38)	(10.86)	(2.24)
Method	FE	FE	FE	FE	POLS	POLS	POLS	POLS	RE
R-square	0.442	0.443	0.440	0.434	0.483	0.529	0.533	0.538	0.417
N	820	820	820	820	820	820	820	820	820

*, ** and ***denotes the significance at the 10, 5 and 1percent level respectively. Heteroskedasticity robust t-statistics are in parentheses. Specifi
definition of *FD1* to represent financial development, the other specifications use *FD2* to test the model robustness. All of the specifications are e
statistics. The indicator of *GOV1* is used in specifications of odd number and *GOV2* is used in even number specifications. The lagged value of p
2SLS is used for estimation.

Table4. The Rural-Urban Income Inequality and Financial Development: IV Estimations (1981-2008)

Independents	Dependent Variable: Gap					
	(1)	(2)	(3)	(4)	(5)	(6)
FD	2.811***	2.584***	3.465***	2.802***	2.811***	2.584***
	(5.95)	(6.72)	(12.56)	(11.06)	(5.95)	(6.72)
FD-Squared	0.124	0.0804	0.0762	0.117	0.124	0.0804
	(1.22)	(0.86)	(1.10)	(1.78)	(1.22)	(0.86)
PCGDP*FD	-1.149**	-1.001**	-1.919***	-1.810***	-1.149**	-1.001**
	(-3.44)	(-3.26)	(-12.19)	(-12.55)	(-3.44)	(-3.26)
PCGDP-Squared*FD	0.154**	0.136**	0.251***	0.246***	0.154**	0.136**
	(2.81)	(2.77)	(8.25)	(8.36)	(2.81)	(2.77)
PCGDP	1.476***	1.265***	2.576***	2.457***	1.476***	1.265***
	(4.06)	(3.80)	(16.19)	(17.67)	(4.06)	(3.80)
PCGDP-Squared	-0.195**	-0.167**	-0.328***	-0.329***	-0.195**	-0.167**
	(-3.11)	(-3.03)	(-9.41)	(-9.79)	(-3.11)	(-3.03)
GOV	1.247*	0.255	0.450	1.926***	1.247*	0.255
	(2.05)	(0.41)	(1.06)	(6.96)	(2.05)	(0.41)
DEV	-0.632	-0.351	-4.449***	-3.775***	-0.632	-0.351
	(-1.39)	(-0.82)	(-26.32)	(-24.19)	(-1.39)	(-0.82)
Constant	-0.105	0.115	1.065***	1.081***	-0.105	0.115
	(-0.29)	(0.38)	(5.36)	(6.64)	(-0.29)	(0.38)
Method	FE	FE	POLS	POLS	RE	RE
R-square	0.407	0.406	0.505	0.515	0.407	0.406
N	806	806	806	806	806	806

*, ** and ***denotes the significance at the 10, 5 and 1percent level respectively. Heteroskedasticity robust t-statistics are in parentheses. Specifications (1), (3) and (5) use the indicator of GOV1, and GOV2 is used in other specifications. The ratio of fixed capital investment to GDP and the ratio of deposit to GDP are employed as instruments of financial development and 2SLS is used for IV estimation.

4. Concluding Remarks

The existing literature shows that financial development has close relationship to income distribution. Three classes of theories on the impacts of financial development are reviewed. But there is no agreement on whether financial development deteriorates or improves income distribution. In this paper we assess the impacts of financial development on income inequality with the panel data of China's 31 provinces.

We find that if credit service is only available to a few rich people, finance would deteriorate income distribution. As the coverage of credit service becomes wider, finance may decrease income inequality. In addition, finance plays different roles at different stages of economic development. At the starting stage of economic growth, when physical capital is the engine of economic development, financial development is helpful to reduce the income inequality. But if an economy has developed into the mature stage, where human capital is much more important than physical capital, financial development may only benefit the talented. The reason is that physical capital can flow from one place to another place, owned by one person or another; but

human capital has close relation with natural endowments and cannot flow from one person to another. Therefore if the economy is not developed and physical capital has a high return, almost anyone is able to use more physical capital to earn more money if he/she has access to credit. But in a mature economy where the return to human capital is pretty high, only the people with great human capital are able to improve their income obviously. Credit is not important to those with low human capital. As a result, financial development may harm the income distribution in a highly developed economy. This paper also confirms the hypothesis of income inequality dynamics developed by Kuznets (1955).

Based on the analysis of the estimation results we argue that although at present China's finance is deteriorating the rural-urban income inequality, a wider access of credit and a higher level of financial development would be helpful. If more credit could be provided so as to realize a wider coverage of financial services, finance may at last help to reduce China's rural-urban inequality.

References

Kerr, W.R. and R. Nanda (2007) "Democratizing entry: banking deregulations, financing constraints and entrepreneurship" Harvard Business School Working paper No.07033

Baland, J.M. and J. Robinson (1998) "A Model of Child Labor" Southern California - Department of Economics Working Paper No.9803

Banerjee, A.V. and A.F. Newman (1993) "Occupational Choice and the Process of Development" *Journal of Political Economy* 101(2), 274-298.

Beck, T., A. Demirguc-Kunt, L. Laeven and R. Levine (2008) "Finance, Firm Size And Growth" *Journal of Money, Credit And Banking* 40(7), 1379–1405.

Beck, T., A. Demirguc-Kunt and R. Levine (2007) "Finance, Inequality and the Poor" *Journal of Economic Growth* 12(1), 27–49.

Black, S.E. and P.E. Strahan (2002) "Entrepreneurship and Bank Credit Availability" *The Journal of Finance* 57(6), 2807-2833.

Demirguc-Kunt, A. and R. Levine (2009) "Finance and Inequality: Theory and Evidence" NBER Working Paper No. 15275

Galor, O. and O. Moav (2004) "From Physical to Human Capital Accumulation: Inequality and the Process of Development" *The Review of Economic Studies* 71(4), 1001-1026.

Greenwood, J. and B. Jovanovic (1989) "Financial Development, Growth, and the Distribution of Income" *Journal of Political Economy* 98(5), 1076-1107.

Jacoby H.G. and E. Skoufias (1997) "Risk, Financial Markets and Human Capital in A Developing Country" *The Review of Economic Studies* 64(3), 311-335.

Kuznets, S. (1955) "Economic Growth and Income Inequality" *The American Economic Review* 45(1), 1-28.

Levine, R., A. Levkov, and Y. Rubinstein (2009) "Racial discrimination and competition" NBER Working Paper No. 14273

Perez-Moreno, S. (2010) "Financial development and poverty in developing countries: a causal analysis" *Empirical Economics* 41(1), 57-80.

Persyn, D. and J. Westerlund. (2008) "Error Correction Based CointegrationTests for Panel Data" *Stata Journal* 8 (2), 232-241.

Rajan, R. and L. Zingales (2003) *Saving Capitalism from the Capitalists*, Crown Business Division of Random House: New York.

Xu, G.X. (2010) "Theoretical and Empirical Analysis on the Effect of the Financial Industry Development on The rural-urban Income Gap" Doctoral Dissertation of Southwestern University of Finance and Economics.

Appendix1. The Rural-Urban Income Inequality and Financial Development: General Estimati

Independents	Dependent Variable: Gap								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FD	2.997**	2.977***	0.914***	0.837***	3.840***	3.746***	1.509***	1.335***	3.351**
	(3.58)	(3.85)	(3.71)	(3.89)	(8.26)	(7.89)	(9.27)	(7.48)	(4.73)
FD-Squared	-0.816*	-0.787*	-0.0402	-0.0278	-1.279***	-1.266***	-0.192***	-0.164***	-0.917*
	(-2.47)	(-2.52)	(-0.69)	(-0.51)	(-5.38)	(-5.37)	(-4.22)	(-3.53)	(-3.12)
PCGDP*FD	-0.808***	-0.818***	-0.270*	-0.276*	-0.841***	-0.822***	-0.164*	-0.179*	-1.090**
	(-3.90)	(-4.14)	(-2.52)	(-2.65)	(-5.61)	(-5.84)	(-2.08)	(-2.32)	(-4.57)
PCGDP-Squared*FD	0.193**	0.190***	0.0434**	0.0430**	0.242***	0.230***	0.0463***	0.0457***	0.249**
	(3.62)	(3.83)	(3.20)	(3.45)	(6.46)	(6.71)	(5.12)	(5.39)	(4.11)
PCGDP	1.583***	1.557***	1.014***	0.981***	2.104***	1.964***	1.211***	1.166***	2.131**
	(5.78)	(6.22)	(4.24)	(4.40)	(11.92)	(12.63)	(8.51)	(9.06)	(7.14)
PCGDP-Squared	-0.337***	-0.328***	-0.170***	-0.161***	-0.465***	-0.435***	-0.248***	-0.233***	-0.436**
	(-4.44)	(-4.76)	(-4.09)	(-4.36)	(-8.15)	(-8.52)	(-7.80)	(-8.49)	(-5.27)
GOV	0.259	0.838	1.126	0.517	0.624	1.716***	1.141*	0.986***	-0.104
	(0.28)	(1.82)	(1.08)	(1.09)	(1.29)	(7.41)	(2.36)	(3.44)	(-0.16)
DEV	-0.412	-0.437	-0.560	-0.472	-4.493***	-3.885***	-4.346***	-3.881***	-2.947**
	(-0.86)	(-0.88)	(-1.24)	(-1.06)	(-30.01)	(-30.90)	(-32.00)	(-28.80)	(-6.13)
Constant	0.388	0.306	1.003**	1.101***	1.708***	1.350***	2.076***	2.060***	1.261**
	(0.69)	(0.68)	(2.85)	(4.23)	(7.21)	(6.10)	(12.14)	(14.05)	(3.83)
Method	FE	FE	FE	FE	POLS	POLS	POLS	POLS	RE
R-square	0.321	0.323	0.331	0.330	0.449	0.486	0.497	0.506	0.293
N	742	742	742	742	742	742	742	742	742

*, ** and ***denotes the significance at the 10, 5 and 1percent level respectively. Heteroskedasticity robust t-statistics are in parentheses. Spe
definition of *FD1* to represent financial development, the other specifications use *FD2* to test the model robustness. All of the specifications ar
statistics. The indicator of *GOV1* is used in specifications of odd number and *GOV2* is used in even number specifications.

Appendix2. The Rural-Urban Income Inequality and Financial Development: IV Estimation about Per-c

Independents	Dependent Variable: Gap								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FD	3.576***	3.507***	1.001***	0.910***	4.153***	4.124***	1.600***	1.391***	3.830**
	(4.13)	(4.46)	(3.83)	(3.91)	(8.54)	(8.26)	(9.33)	(7.36)	(5.41)
FD-Squared	-1.002**	-0.935**	-0.0487	-0.0290	-1.415***	-1.426***	-0.212***	-0.175***	-1.063*
	(-2.86)	(-2.82)	(-0.65)	(-0.40)	(-5.65)	(-5.75)	(-4.41)	(-3.62)	(-3.50)
PCGDP*FD	-0.753**	-0.779**	-0.245	-0.263*	-0.742***	-0.758***	-0.123	-0.149	-1.051*
	(-3.38)	(-3.49)	(-2.00)	(-2.20)	(-4.63)	(-4.72)	(-1.50)	(-1.87)	(-4.13)
PCGDP-Squared*FD	0.172**	0.167**	0.0371**	0.0372**	0.214***	0.207***	0.0402***	0.0396***	0.230**
	(3.46)	(3.52)	(2.92)	(3.12)	(6.44)	(6.45)	(4.66)	(4.81)	(3.99)
PCGDP	1.470***	1.439***	0.900**	0.888***	1.916***	1.795***	1.056***	1.032***	2.017**
	(5.52)	(5.62)	(3.58)	(3.69)	(11.84)	(12.15)	(7.01)	(7.49)	(7.12)
PCGDP-Squared	-0.297***	-0.279***	-0.141***	-0.131***	-0.412***	-0.381***	-0.220***	-0.203***	-0.394*
	(-4.48)	(-4.65)	(-3.81)	(-3.96)	(-8.89)	(-9.26)	(-8.05)	(-8.76)	(-5.40)
GOV	-0.138	1.199**	0.804	0.760	0.238	1.766***	0.851	1.000***	-0.472
	(-0.16)	(2.80)	(0.80)	(1.63)	(0.46)	(7.65)	(1.66)	(3.38)	(-0.79)
DEV	-0.759	-0.898	-0.949	-0.950	-4.613***	-4.014***	-4.468***	-4.028***	-3.173*
	(-1.52)	(-1.69)	(-2.01)	(-2.00)	(-30.19)	(-29.08)	(-32.84)	(-27.68)	(-6.91)
Constant	0.246	0.150	1.117**	1.193***	1.676***	1.252***	2.101***	2.102***	1.124**
	(0.43)	(0.33)	(3.25)	(4.50)	(6.92)	(5.50)	(11.74)	(13.59)	(3.40)
Method	FE	FE	FE	FE	POLS	POLS	POLS	POLS	RE
R-square	0.306	0.310	0.313	0.314	0.448	0.488	0.498	0.509	0.28
N	712	712	712	712	712	712	712	712	712

*, ** and ***denotes the significance at the 10, 5 and 1percent level respectively. Heteroskedasticity robust t-statistics are in parentheses. Spe definition of *FD1* to represent financial development, the other specifications use *FD2* to test the model robustness. All of the specifications ar statistics. The indicator of *GOV1* is used in specifications of odd number and *GOV2* is used in even number specifications. The lagged value of 2SLS is used for estimation.

Appendix3. The Rural-Urban Income Inequality and Financial Development: IV Estimations
(1985-2008)

Independents	Dependent Variable: Gap					
	(1)	(2)	(3)	(4)	(5)	(6)
FD	2.593***	2.560***	3.330***	2.775***	2.593***	2.560***
	(5.78)	(6.53)	(11.32)	(9.62)	(5.78)	(6.53)
FD-Squared	0.0452	0.0128	-0.0562	-0.0226	0.0452	0.0128
	(0.49)	(0.15)	(-0.84)	(-0.35)	(0.49)	(0.15)
PCGDP*FD	-0.906**	-0.842**	-1.394***	-1.300***	-0.906**	-0.842**
	(-3.47)	(-3.32)	(-8.61)	(-8.81)	(-3.47)	(-3.32)
PCGDP-Squared*FD	0.118**	0.107*	0.165***	0.158***	0.118**	0.107*
	(2.86)	(2.70)	(6.04)	(5.95)	(2.86)	(2.70)
PCGDP	1.256***	1.178***	2.007***	1.893***	1.256***	1.178***
	(4.28)	(4.15)	(12.28)	(13.43)	(4.28)	(4.15)
PCGDP-Squared	-0.156**	-0.140**	-0.225***	-0.220***	-0.156**	-0.140**
	(-3.15)	(-3.01)	(-7.22)	(-7.55)	(-3.15)	(-3.01)
GOV	-1.224	0.0892	-0.975*	1.776***	-1.224	0.0892
	(-1.74)	(0.15)	(-1.99)	(6.05)	(-1.74)	(0.15)
DEV	-0.899	-0.906	-4.560***	-4.080***	-0.899	-0.906
	(-1.87)	(-1.82)	(-27.62)	(-24.33)	(-1.87)	(-1.82)
Constant	0.476	0.430	1.496***	1.429***	0.476	0.430
	(1.24)	(1.31)	(6.52)	(7.21)	(1.24)	(1.31)
Method	FE	FE	POLS	POLS	RE	RE
R-square	0.306	0.310	0.488	0.500	0.306	0.310
N	707	707	707	707	707	707

*, ** and ***denotes the significance at the 10, 5 and 1percent level respectively. Heteroskedasticity robust t-statistics are in parentheses. Specifications (1), (3) and (5) use the indicator of GOV1, and GOV2 is used in other specifications. The ratio of fixed capital investment to GDP and the ratio of deposit to GDP are employed as instruments of financial development and 2SLS is used for estimation.