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Development of Financial Intermediation and the Dynamics of Rural-Urban Inequality

China, 1978-98

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Abstract

Using China as a test case, this paper empirically investigates how the development of financial intermediation affects rural-urban income disparity (RUID). Using 20-year province level panel data, we find that the level of financial development is positively correlated with RUID. Examining two subperiods, 1978-88 and 1989-98, we test several competing hypotheses that may affect RUID. We find that the increase of RUID may be explained by fiscal policy during the first period and financial intermediates during the second period. In addition, we show that the direction of the Kuznets effect on RUID is sensitive to changes in government development policies. The rural development policies during the first period may have enhanced the rural development and reduced RUID. However, the financial intermediary policy during the second period focused on urban development and increased both urban growth and intra-urban inequalities, thus leading to an increase in RUID. Finally, we show that RUID is insensitive to the provincial industrial structure (the share of primary industry in GDP). These results are consistent with the

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traditional urban-bias hypothesis and are robust to the inclusion of controls for endogeneity issues. This study adds to the economic inequality literature by clarifying the effects of government policies on the underlying dynamics on convergent and divergent effects on rural-urban inequality.

Acronyms

ABC   Agricultural Bank of China
FDI   foreign direct investment
GMM General Method of Moment
HRS   household responsibility system
IPOs   initial public offerings
PBC   People's Bank of China
RCCs rural credit cooperatives
RCFs rural credit foundations
RUID rural-urban income disparity
SCBs   state-owned banks
SEZs   special economic zones
TFP   total factor productivity
TVEs township and village enterprises

Figures and tables appear at the end of the paper.

1   Introduction

Financial development and its relationship to economic growth has been a growing research area. Financial systems may contribute to economic growth by mobilizing and pooling savings, diversifying investment risks, screening investment projects, facilitating exchange, monitoring managers and exerting corporate control. Empirical evidence also supports the argument that fiscal policies have a profound effect on economic development (Goldsmith 1969; McKinnon 1973; Shaw 1969; Stiglitz 1985; Mayer 1990; King and Levine 1993a, 1993b; Beck and Levine 2002).

The study of the relationship between economic growth and income inequality has a long history and was pioneered by Kuznets' seminal paper (1955) on the subject.[1] However, relatively few studies focus on the relationship between financial development and income distribution. The study by Greenwood and Jovanovic (1990) is the first to explore the association between economic growth, financial development and income distribution, where income distribution is treated as exogenous. Galor and Zeira (1993), and Banerjee and Newman (1993) maintain that the initial income gap would not be reduced unless financial markets (especially the credit market) are well developed. The latest study by Clark, Xu and Zou (2003), using cross-country data, explores how financial development influences income distribution. They find that financial development robustly reduces the level of income inequality.

In this paper we use panel data on China's 28 provinces for the period of 1978-98 to analyse the effect of the development of financial intermediation on rural-urban income inequality (RUID). Using two-way fixed effects estimation, two fixed effects instrumental variable estimation, and general method of moment (GMM), we find that the financial development index (measured as the ratio of total loans to GDP, as extended by financial intermediates) has contributed significantly to the increase of rural-urban income disparity since the late 1980s. This is the case even after controlling for other factors such as provincial infrastructure, institutional transition in rural areas, and degree of international integration, and other related variables. The major driving force of RUID is the government's growing reliance on the financial system since the late 1980s to regulate the economy, whereas before that time fiscal policy was the principal policy instrument. In addition, we show that the positive correlation of provincial financial intermediation with RUID is robust to sector structure changes in the province.

We also show that the central government's choice of development policies may have different effects on the underlying inequality in different sectors. This might facilitate the emergence of the Kuznets effect, a negative relationship between square of GDP and RUID. These governmental development policies may influence growth, intra-urban inequality, and intra-rural inequality in different sectors over different periods. In China, these policies may include the household responsibility system, rural industrialization, and financial intermediation. In particular, we show that a convergence of (negative relation) Kuznets effect, reducing RUID during 1978-88, which was a period of high

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[1] The inverse U-shaped 'Kuznets' curve' describes the convergence of inequality between two sectors (urban and rural) during a period of economic growth. The urban-rural income disparity (RUID) may first diverge due high levels of urban economy and urban inequality relative to the rural sector. The convergence of inequality will then be the result of industrialization and urbanization at a later stage (Kuznets 1955: 17-8).

agricultural growth and the development of the township and village enterprises (TVEs) narrowed the rural-urban gap in GDP. However, a divergence of (positive relation) Kuznets' effect might have occurred during 1989-98. This period is characterized by urban reform and urban-biased policies such as investment and other government policy developments that increased urban growth and urban inequality, while the agricultural sector stagnated during the period. The two effects jointly caused the increase of RUID and revised the Kuznets' effect.

The paper is organized as follows. We begin with a brief discussion of why a single-country case makes sense, and the benefits of using China for our study. Next we take a look at how hypotheses such as financial intermediation development, sources of growth, and government polices might have affected changes in RUID in China. We continue with specifics on our model and data, and we follow-up with the estimation strategy and results. We then consider how our findings relate to the Kuznets hypothesis, and offer a brief conclusion.

2   China as a case for testing competing hypotheses on RUID

According to some recent studies, China's rural-urban income inequality constitutes the most significant component of overall income inequality.[2] We use China as a country case to examine the effect of financial intermediation development on the within-country rural-urban income disparity, as opposed to cross-country analyses. We argue that there are at least three advantages of studying the effect through a country case.

First, in cross-country comparisons the differences in institutions, culture and legal systems among countries are difficult to control for. In addition, problems in data collecting and processing methodology make the income distribution comparison between countries less credible (Wei and Wu 2001; Atkinson and Brandolini 2001).[3]

Second, using a single country can help to resolve some of the debate on the convergence effect of financial intermediation on inequality: the Kuznets' curve.[4] Kuznets (1955: 14-6) argues that urbanization is a result of rural-urban migration, but Anand and Kanbur (1993) point out that the interaction between population shifts and

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[2] Tsui (1993) decomposes regional disparity into five elements, namely (i) within-province disparity, (ii) between-province disparity, (iii) within-countryside-area disparity, (iv) within-urban-area disparity and (v) rural-urban disparity. He notes that rural-urban disparity has played a leading role in the growth of regional disparity. The World Bank (1997), using China's 1995 data, concludes that no less than half of overall income disparity can be explained by rural-urban income disparity. By using Theil decomposition method, Lin, Cai and Li (1998) also find that rural-urban per capita income disparity explains at least 50 per cent of overall regional disparity, while the within-rural disparity and within-urban-area disparity account for the other half.

[3] Knight and Song (2001) also argue that China is a good country case for studying economic inequality.

[4] One of the key assumptions of Kuznet's hypothesis on the convergence of inequality between sectors is the difference in the inequality levels of the urban and rural settings. Postulating that urban settings have higher inequality than rural areas, Kuznet then analyses the impact of overall inequality during periods of economic growth.

income inequality may be far more complex than Kuznets' assumption and may obscure the results.

Third, government policy may affect the magnitude and direction of inequality in a country. Endowed with large regional variation, China constitutes good case for a cross-country analysis of a country with similar initial background. Similar initial background is an essential element for a comparative study that most cross-country studies generally lack (Kanbur 2000: 84). The common background of regions within a country makes the evaluation of government policy more effective and helps to clearly identify the implications of policy on inequality (Kanbur 2000: 17, 31).

3   The development of RUID in China (1978-98) and the conflicting hypotheses

In this section we include a brief review of the evolution of RUID from 1978 to 1998 in China. We also discuss several competing hypotheses with regard to the causes of RUID.

China's economic growth rate has been remarkable, averaging nearly 10 per cent since the early 1980s. However, income inequality, especially rural-urban income inequality, is a pressing issue and has become even more so in recent years. As an important policy concern, RUID may affect the livelihoods of most peasants as well as stability of the society, as China is still arguably a developing county with large agricultural sector. In Figure 1, we present the evolution of rural-urban income disparity (measured as the ratio of disposable income of urban residents to net income of rural residents) across 28 provinces for the years 1978-98. It is clear that rural-urban income disparity declined in the early 1980s, but has increased from the late 1980s. In the late 1990s, RUID in many provinces exceeded even that of the late 1970s when market reform was initiated. For instance, Beijing's RUID rose from 1.63 in 1978 to 2.11 in 1998. In the central province of Anhui, the gap rose from 1.72 to 2.56 for the same period, while in the northeast province of Jilin, it rose from 0.97 to 1.76. A cross-province comparison shows that there is a negative correlation between disparity and per capita income (measured in 1978 *yuan*, Figure 2). These findings are supported by other researchers in the field (Hu, Wang and Kang 1995; Wei Houkai 1997; Zhang 2000).

We are concerned with the following questions: First, since the urban-biased policies pursued by the Chinese authority have not profoundly changed over last two decades, how well does the 'simple' urban-bias argument fit with the dynamic changes in the effects of the development of financial intermediation on RUID? Second, what are the government policies and/or sources of growth that might have an impact on RUID? In the following, we highlight some competing hypotheses regarding the source of growth and its relation with RUID, which we test in this paper.

3.1 Financial intermediation development

The development of financial intermediation under the monopolized banking system in China may have had an effect on RUID.[5] China maintains a monopolized bank-based

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[5]   Appendices 1 and 2 provide a detailed report on historical development of financial structure in China during the 1990s and government regulations on the rural financial system, respectively.

financial structure in which the four state-owned banks (SCBs) together account for two-thirds of the financial assets (IFC 2000). Of these SCBs, only the Agricultural Bank of China (ABC) has the mandate to provide loans to the agricultural sector, but in practice very few farmers get financial support directly from ABC. Most farm loans are financed through rural credit cooperatives (RCCs) but even these are directed primarily toward ventures rather than individual farmers. Despite their name, even the RCCs have been shown to have an urban bias in their lending structure (Sheng 2001). Our objective is to investigate the role of financial intermediation on RUID, a research area that has received too little attention. Research has shown that a significant urban-bias has emerged in the Chinese financial system (see also Wei, S.-J. 1997). Our paper focuses on testing the changing effects of financial intermediation on RUID under this monopolized banking system during the marketization period that signified the government's reliance on the banking system as a means of fiscal policy instrument.

3.2 Rural reform and open door policies

The rural reform and open door policies initiated in the 1980s certainly may have played an important role in China's RUID. Kanbur and Zhang (2003) use a longer provincial-level panel to analyse regional inequality in China from 1952 to 2000.[6] They argue that the great famine of the late 1950s and the cultural revolution during the late 1960s and 1970s introduced increases in inequality. They also argue that heavy industrialization increased rural-urban inequality during the pre-reform period, and that the recent policy of decentralization and openness has increased coastal versus inland income disparity. In this regard, it is in our interest to test how rural reform, openness, FDI, and trade have affected RUID since reform in the 1980s. We also assess the contribution of the three municipal-level cities (Beijing, Tianjin and Shanghai)[7] to RUID.

3.3 Urban biased policies and industrial structural change

Urban biased policies and industrial structural change may also have had an effect on RUID. Yang (1999) argues that urban-biased policies may have generated long-term regional disparity. Lu and Wang (2002) argue along similar lines, attributing the uneven regional development to differences in regional production factors and the legacy of colonial history in the coastal area, particularly the presence of industrial infrastructure. Yang and Wei (1995) also show that the average annual growth rates of GNP and industrial gross output values in inland regions have been lower than those in coastal regions since 1980. Using regional GDP as well as the GDP of three industrial sectors, Huang *et al.* (2003) show that underdevelopment of the secondary industry may have contributed to the increasing regional inequality. Therefore, we test the effect of rural finance, fiscal policy, and industrial structure on RUID.

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[6] They employ an alternative inequality index, a member of the decomposable generalized entropy class of inequality measure, pioneered by Shorrocks (1980, 1984).

[7] In the empricial analysis Chongqing is also included in the data for Sichuan province.

4　Model specification and data

We want to test empirically several competing hypotheses with the following equation. In particular, we would like to test the relationship in China between the gap in RUID and financial development while taking other potential factors into account. Our basic econometric model is as follows:

$$\ln(URID)_{it} = C + \alpha_1 \cdot \ln(PER\ GDP)_{it} + \alpha_2 \cdot (\ln(PER\ GDP))_{it}^2 + \alpha_3 \cdot FINDEV_{it}$$
$$+ \alpha_4 \cdot AGRFINDEV_{it} + \sum_j \beta_j \cdot D + \varepsilon_{it} \tag{4.1}$$

where subscript i and t denote ith province and tth year respectively. ε is the error term with the standard normal distribution of $N(0,\delta^2)$. Dependent variable $RUID$ is the value of the ratio of urban per capita disposable income to rural per capita net income. We use it to gauge the $RUID$ gap.

We test several competing hypotheses here with independent variables at the right side of the equation and see how those factors affect $RUID$ in China.

$PERGDP$ and $PERGDP^2$ are the values of real per capita GDP (in 1978 prices) at provincial level and its square term, respectively. We add the square of $PERGDP$ to see whether there is Kuznets' effect, namely an inverted u-shaped relationship between income inequality and income level.

$FINDEV$ is the value of the ratio of loans to GDP, loans extended by financial intermediation in one province. We use this variable to measure the development of financial intermediation at the province level. We expect $FINDEV$ to increase $RUID$ over the period in general, but particularly during second period, 1990 to 1998, when China expanded financial intermediation through the monopolized banking system. In this regard, we expect the coefficient of $FINDEV$, namely α_3, to be positive and statistically significant.

$AGRFINDEV$ is the value of the share of formal institutional loans to agriculture sectors in total loans. We argue that the sign and significance of α_4, the coefficient of $AGRFINDEV$, cannot be predetermined since the data on $AFINDEV$ probably do not reflect the actual amount of loans to agricultural sectors.

D is a vector of control variables for government development policies (or the conditioning information set) which include: $EXPORT/GDP$, the ratio of the total value of export to GDP at the province level; FD/GDP, the ratio of the volume of foreign direct investment (FDI) to GDP at the province level. $EXPORT/GDP$ and FDI/GDP represent the international integration level. With these two variables, we can test whether international integration affects RUID. Jones, Li and Owen (2003), using city-level data, establish a link between the special economic zones (SEZs) and 'growth enhancing' FDI.

$REFORM$ is the proportion of farm households adopting the 'household responsibility system' in a province, used to measure the progress of the rural household responsibility reform in a province. It needs to be noted that in 1987 all rural households had adopted the household responsibility system, therefore $REFORM$ is 1 since then.

FISCAL_AGR is the log value of the share of fiscal funds supporting agricultural production in total fiscal expenditures. *FISCAL/GDP* is the log value of the ratio of fiscal expenditures to GDP. We add this variable to the model to compare the effect of *FINDEV* with the effects of government's fiscal policy in different periods.[8]

Data for 28 Chinese provinces for the period -98 are used in the empirical analysis.[9] All data are collected from Liu (2002) and *The Compilation of Statistic Data of New China for 1978-1999* (SCB 2000). Variables and data resources are listed in Appendix 3.

Table 2 gives the descriptive statistical results of some principal variables for the period 1978-99. As can be clearly seen, *RUID* is on average the variable with the greatest deviation. The province of Gansu has the largest value for *RUID*, 3.04, while Shanghai has the smallest. It is also obvious that provinces with higher per capita income also exhibit lower *RUID* values. In addition, Tianjin with a value of 1.98 has the highest level of *FINDEV* compared to Zhejiang province, which has the lowest value, 0.448.

5   Estimation strategy

To estimate equation (4.1), we first present results using OLS method with two-way fixed effects which control for the province dummy and time dummy simultaneously. However, the results of the traditional OLS method are efficient and consistent only when explanatory variables are exogenous. In equation (4.1), some explanatory variables, among them especially *FINDEV*, are assumed to be endogenous variables. To address this problem, we then present results from the system generalized methods of moments (GMM) estimation.

In a system GMM, the first difference GMM estimator takes the first difference of the proposed equation in order to remove the fixed individual effects from the equation. And under the assumption that there is no serial correlation in the error term, the lagged levels of the explanatory variables can be used as instruments of the first differenced variables. This method has the advantage of avoiding the biases related to omitted specific individual effects and to control for endogeneity arising from bi-directional causality. However, in the case of highly persistent data, lagged variables in levels are likely to be weak instruments for contemporaneous differences, making first-difference GMM estimators biased (Blundell and Bond 1998). Bond, Hoeffler and Temple (2001) therefore recommend the use of the so-called System-GMM estimator (Arellano and Bover 1995) in which we use lagged levels as instruments for contemporaneous differences and lagged differences as instruments for contemporaneous levels. According to results from the Monte Carlo experiment, the SYS-GMM estimator

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[8]   Due to potential problems of simultaneity, the estimation does not include an urbanization index for the provinces. If, however, urbanization is measured as the ratio of the proportion of urban population in the total population of a province, inclusion of this variable does not change the estimation results much.

[9]   Due to data limitations, two provinces, namely Hainan and Tibet, are not included.

performs substantially better than the standard differenced GMM estimator, especially when data are highly persistent.[10]

6   Estimation results

6.1 Basic estimation results

Table 3 reports several results based on the two-way fixed effects estimation, and system GMM estimation, respectively. Some statistical test values relating to model specification show that the statistical property of econometric model is very good. For example, adjusted R^2 values in *TWFE* are high and Sargan test values in GMM also fail to reject the null hypothesis that lagged values are appropriate instruments.

The focus of our analysis is on the effect of *FINDEV*, the proxy for the development of financial intermediation. The coefficient is consistently significant at 1 per cent level in all OLS estimations (columns 1-4). After controlling set *D* is included in the GMM regression, the coefficient of *FINDEV* becomes significant at the 10 per cent level.[11] In addition, the value of the estimated coefficient of *FINDEV* increases around 40 per cent compared to OLS results after accounting for endogenous effects. In general, these results are consistent with our expectation that financial development on the whole contributes to the expansion of *RUID*.

To investigate the Kuzents effect, we look at the both OLS and system GMM, the signs of the estimated coefficients of *PERGDP* and its square term are positive and negative, respectively, and both coefficients are significant at 1 per cent or 5 per cent level, suggesting that there is an inverted-U shaped curve relationship between per capita income and *RUID*.

We now turn to the variables for rural development policies. The estimated coefficient (α_4) for the proportion of agricultural loans is not significantly different from zero, indicating that agricultural loans did not significantly affect *RUID*. These results again confirm our argument that China's formal financial intermediation is inefficient in providing financial services to the agricultural sectors. As expected, the coefficient of *REFORM* is significantly negative in OLS estimation results (column 3), indicating that agricultural deregulation did facilitate the fall in *RUID*.

For the openness and FDI hypothesis, *FDI/GDP* has a significant positive coefficient in the OLS result. This result is consistent with the geographic distribution of FDI which tends to benefit urban areas more. On the other hand, after controlling for endogenous effects in GMM, both household responsibility system (HRS) and FDI lose their significance.

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[10] In econometric models, the GMM method has the advantage of avoiding biases related to omitted specific individual effects and controlling for endogeneity arising from bi-directional causality. For details, see Arellano and Bond (1991).

[11] As far as the results in system GMM without controlling for the set *D* are concerned, the estimated coefficient of *FINDEV* is not significant in column 2 despite its positive sign. This may well, however, be a case of a missing variable.

Government fiscal policy cam also be an important factor. What intrigues us is the coefficient of *FISCAL/GDP*, in both OLS and system GMM, which has the expected positive sign and is very significant. Moreover, the magnitude of the coefficients of *FISCAL/GDP* is bigger than those of *FINDEV*, which indicates that the impact of fiscal means is greater than that of financial intermediation.

So far we have explored an overall effect of the development of financial intermediation on *RUID* for the period of 1978-98. However, we want to see whether there is a difference in this effect prior to and after the late 1980s period. We argue that it was not until the late 1980s that the Chinese government used banks as their principal policy instrument to regulate the economy. Therefore we split the sample duration into two parts; the decade from 1978 to 1988 and from 1989 to 1998.

6.2 The effects of *FINDEV* in the different periods

Tables 4 and 5 present estimation results for the two subperiods, 1978-89 and 1990-98, respectively. It must be noted that because the value of *REFORM* will be time-invariant after 1987, this variable will not be included in the regression for the 1989-98 decade due to the collinearity problem.

The results of the estimated coefficient of *FINDEV* in Tables 4 and 5 robustly and consistently suggest that the effect of *FINDEV* is significant only in the 1989-98 period, while in the decade of 1978-88 the effect is not significant. We expect that this is because around the year 1989, rural reform stalled and policy priority was targeted towards urban sector reform. Regulations for rural economy and rural financial system were tightened again, thus the *RUID* gap would predictably be increasing since then.

The sign of the coefficients of Ln(*PERGDP*) and its square term are significantly positive and negative, respectively, in the first period (Table 4), but the sign is reversed in the second period (Table 5). This implies that the inverted-U curve relationship between *RUID* and level of economic development has changed to a U-curve (diverging) relationship in the second period. The cause of this fundamental change may due to the fact that economic growth shifted from rural regions (agricultural) to urban areas (financial) during the transition from the first period to the second.

In addition, while the effect of *EXPORT/GDP* is significantly negative only during the first subperiod, *FDI/GDP* has a significantly positive coefficient in both subperiods. This probably suggests that exploitation of the comparative advantage in terms of foreign trade significantly reduced *RUID* only in the 1980s.[12]

Moreover, in section 2 we argue that over the two periods, the government shifted from fiscal policy to financial system in the implementation of its policy goals. If our argument is true, we would expect the estimated effects of fiscal policy in the first period (1978-89) to be significant on *RUID* and to be greater than those induced by the

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[12] A possible explanation is that since late the 1980s, labour migration from rural to urban areas to look for jobs has become more popular. A great number of rural workers are concentrated in the relatively developed coastal provinces of Guangdong, Jiangsu, Beijing, Shanghai, and so on, where international trade volume is higher.

development of financial intermediation, whereas in the second period (1990-98) these effects should be smaller and likely to be insignificant.

In the full sample regressions, the results in Table 3 show that the overall effect of fiscal policy on *RUID* for the total sample period is highly significant and larger than that of the development of financial intermediation. However, if the period is divided into two subperiods, as in Tables 4 and 5, a different picture emerges. For the 1978-89 period, the estimated coefficient of *FISCAL/GDP* is significant and bigger than that of *FINDEV* (columns 3 and 4, Table 4). But for the 1990-98 period, the estimated coefficient of *FINDEV* is significant and larger than that of *FISCAL/GDP*, and the latter loses its significance (columns 3 and 4, Table 5).

We conclude that both the development of financial intermediation and fiscal policy contribute to the growing *RUID*, but the former plays a leading role in the 1990s, whereas the latter is the most prominent factor in the 1980s. These results are consistent with our theoretical argument.

To be more specific, in the early 1980s, urban residents were granted living allowances by the government even though procurement prices for many agricultural products were considerably eased. The proportion of fiscal funds in total fiscal expenditures supporting agricultural development (*FISCAL_AGR*) is very small (3 per cent on average). Thus even in the early 1980s, fiscal policy contributed significantly to the growing *RUID*. Since the late 1980s, the government has increased its support to agricultural development only slightly (9 per cent on average in terms of *FISCAL_AGR*), and at the same time changed its principal policy instrument from fiscal policy to financial policy. The results are given in Tables 4 and 5.

6.3 Extended model specification and results

The approach outlined so far enables us only to identify an overall and direct effect of *FINDEV* on *RUID*. However, such analysis does not allow us to simultaneously identify the effects of both financial intermediation and structural characteristics of the economy. For example, in a province with a higher share of agriculture output in GDP, will the *RUID* gap be larger or smaller when the banks lend more (Clark, Xu and Zou 2003)? In order to examine these effects, we modify our basic model specification of equation (4.1) by adding the interaction between *FINDEV* and the variables considered to reflect the structural features of the economy.

The first extended model specification is as follows:

$$\ln(URID)_{it} = C + \alpha_1 \cdot \ln(PERGDP)_{it} + \alpha_2 \cdot (\ln(PERGDP))_{it}^2 + \alpha_3 \cdot FINDEV_{it} + \alpha_4 \cdot AGRFINDEV_{it} \\ + \alpha_5 \cdot (FINDEV * AGR/GDP) + \alpha_6 \cdot AGR/GDP + \sum_j \beta_j \cdot D + \varepsilon_{it}$$ (6.1)

where *AGR/GDP* is the share of primary industry's GDP in total GDP. Kuznets (1955) argues that income inequality increases as people move from the low-income, but more egalitarian, agricultural sector to the high-income, but less egalitarian, industrial sector. In other words, income inequality depends on the sectoral structure of an economy. In order to control for this effect, we add *AGR/GDP* to equation (4.1).

We also add an interaction term $FINDEV * AGR/GDP$ to equation (4.1). As Clarke, Xu and Zou (2003) argue, sector structure will affect the impact financial depth has on inequality.[13] In their paper, these authors assert that if entry into a modern sector (industry and service) is made easier when access to finance is easier, then inequality should be greater in economies with larger modern sectors. Consequently, inequality should be higher in countries with large modern sectors and greater financial depth than in countries with only one (or neither) of these characteristics.[14] As far as the relationship between RUID, financial development and sector structure is concerned, if Clarke, Xu and Zou's augmented Kuznets' hypothesis is right, the estimated coefficient of $FINDEV * AGR/GDP$ should be negative and statistically significant; on the other hand, we believe this interaction term can also be used as a vehicle to test whether the urban-bias hypothesis pertains to the relationship between RUID and financial development. If urban bias does exist, the coefficient on the interaction term should be insignificant (financial intermediation will be insensitive to variations in sector structure). The estimation results of equation (6.1) are reported in Table 6.

We can see from the results in most regressions (except for column 4) that α_6 is significantly negative, which is consistent with the finding in Clarke, Xu and Zou (2003), and thus supports the Kuzents hypothesis that *RUID* increases during the transition from agriculture to modern industry. Moreover, our analysis focuses on the signs and significance level of α_3 and α_5. While α_3 is still significant during the second subperiod (columns 5 and 6), α_5 is insignificant in all regressions. These results seem to support the urban-bias hypothesis, as opposed to the Kuzents hypothesis since the effects of *FINDEV* do not depend on changes in industrial structure. In addition, results in Table 5 substantiate the affirmation that the impacts of financial intermediation on *RUID* are mainly observed in the 1990s

The above results of Tables 3-6 are based on a sample of 28 provinces. However, we doubt whether the financial intermediation effects of the three municipalities—Beijing, Tianjin and Shanghai—are different from that of the other provinces in terms of policy settings. For political purposes, particularly to maintain a stable political environment, the central government extends more preferential policies to the three municipalities to mobilize all possible resources to ensure the development of these cities. This includes maintaining *RUID* at a low level. In order to test whether there is a structural difference in the impact of financial intermediation between other provinces and the three municipals (Beijing, Tianjin and Shanghai), we re-run the regressions using model specifications (6.2) and (6.4), corresponding to the specification (4.1) and (6.1) respectively. We wish to see whether the effects of intermediation undergo a change as a result of provincial structure differences, which are measured by the sign and significance level of the new interaction terms (*PD∗FINDEV, PD∗ (AGR/GDP∗FINDEV)*).

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[13] Yang and Wei (1995) also show that the average annual GNP growth rates and industrial gross output value in the inland regions have been lower than in the coastal regions since 1980.

[14] List and Gallet (1999), using a panel of 71 countries from 1961 to 1992, also show that inequality increases in the most advanced countries when the industrial structure shifts from manufacturing to a service base.

$$\ln(URID)_{it} = C + \alpha_1 \cdot \ln(PERGDP)_{it} + \alpha_2 \cdot (\ln(PERGDP))_{it}^2 + \alpha_3 \cdot FINDEV_{it} +$$
$$\alpha_4 \cdot (PD * FINDEV) + \alpha_5 \cdot PD + \alpha_6 \cdot AGRFINDEV_{it} + \sum_j \beta_j \cdot D + \varepsilon_{it} \qquad 6.2$$

$$\ln(URID)_{it} = C + \alpha_1 \cdot \ln(PERGDP)_{it} + \alpha_2 \cdot (\ln(PERGDP))_{it}^2 + \alpha_3 \cdot FINDEV_{it} + \alpha_4 \cdot (PD * FINDEV)$$
$$+ \alpha_5 \cdot (FINDEV * AGR/GDP) + \alpha_6 \cdot (PD*(FINDEV * AGR/GDP)) + \alpha_7 \cdot AGR/GDP + \alpha_8 \cdot PD$$
$$+ \alpha_9 \cdot AGRFINDEV_{it} + \sum_j \beta_j \cdot D + \varepsilon_{it} \qquad (6.3)$$

where *PD* is a provincial dummy variable that takes value of 1 if one province belongs to Beijing, Tianjin and Shanghai, taking otherwise the value of 0. If a structural difference exists in terms of the effects of financial intermediation due to geographic location, then we expect the estimated coefficients of the interaction terms to be statistically significant. The results are reported in Tables 7 and 8, respectively.

In Table 7, after controlling for the *PD* dummy and its interaction term of *FINDEV*, we obtain results similar to those given in the previous tables, i.e., the estimated coefficients of *FINDEV* are still positive and statistically significant (columns 1 and 2), and this statistical significance level is mainly due to its significant effects in the 1990s (columns 5 and 6). Correspondingly, the estimated coefficients of the fiscal expenditure ratio to GDP (*FISCAL/GDP*) become significant only in the 1980s. These results are highly consistent with those given in Tables 3-6. In addition, the interaction terms are significantly negative only in the regressions using the subperiod sample for the 1980s, implying that loans extended during this period through financial intermediation in Beijing, Tianjin and Shanghai tended to reduce *RUID*. However, this effect faded in the 1990s. Finally, the U-curve relationship between per capita GDP and *RUID* occurred only in the 1990s.

Table 8 presents the estimated results for equation (6.3). Similar to the results in Table 7, *FINDEV* has significant coefficients for the 1990s, but loses significance in results for the 1980s. Other interaction terms are not significant in most regression results. In the meanwhile, the estimated coefficients of *FISCAL/GDP* are significant only in the 1980s. The economic structure variable, *AGR/GDP*, remains significant in most regressions. Moreover, the estimated coefficients of the per capita GDP and its square term are no longer significant in most regressions.

To sum up, based on the results from the regression models, we find that the expansion of the loan size of financial intermediation sharply increases the income disparity between rural and urban residents, after controlling for income level and other explanatory variables and taking the potential endogeneity problem into account. More importantly, the effects of financial intermediation were not significant until the 1990s. The results strongly support our assumption that in the 1980s, provincial governments used fiscal policy for economic intervention rather than relying on financial intermediation in order to realize its policy intentions. In other words, the changes in the role of financial intermediation and finance with regard to their effects on *RUID* in the different periods reflect their importance as government policy tools for regulating the economy.

7   Has the Kuznets effect occurred during the period?

One of the key assumptions of the Kuznets hypothesis on the convergence of inequality between sectors is the difference in the levels of rural and urban inequality. Kuznets postulates that an urban setting has higher growth and higher inequality than rural areas.

The development of government policies in China may possibly have affected intra-urban, inter-urban, as well as rural-urban inequality.[15] The uneven distribution of financial intermediation in China has coincided with changes in its economic development policies. This uneven development may resemble the GDP divergence of different countries, which makes it difficult for cross-section studies to highlight a definite relationship between growth and distribution (Kanbur 2000: 7).

Using China as a country case, we find (as shown in Tables 4-8), that the Kuznets effect may have occurred during the first period, 1978-88, which was characterized by rapid agricultural and TVE development as well as underdevelopment of financial intermediation in urban centres. In particular, the coefficients of square term of Ln(*PERGDP*) in the first period are higher than those of the pool sample in each estimation. This is consistent with the recent history of agricultural development in China.

The financial intermediation *FINDEV* has a stronger positive effect in the second period than the pooled sample among those estimations (in the third column). Moreover, we find that the $(Ln(PERGDP))^2$ effect turns positive. The logic could well be that urban inequality changed the position of the curve from convergent to divergent effect.[16] The slope of the $(Ln(PERGDP))^2$ now shifted from the right side (negative slope) of the Kuznets curve to the left side (positive slope). That is, the level of inequality during the second period may resemble the initial assumption of economic growth in the Kuznets curve, i.e., high growth and high inequality in urban settings.[17] The liquidity constraint of TVEs and other agricultural businesses may intensify *RUID*: low relative income in rural areas.[18]

In sum, the significant shift of the Kuzents curve may well represent the sharp differences in the source of growth. Growth in the first period may reflect development of the agricultural sector, including agricultural production and TVEs. However, growth

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[15] Riskin, Renwei and Li (2001) provide a thoughtful selection of papers on inequality in China.

[16] Knight, Shi and Renwei (2003) use a ten-province survey data conducted in 1988 and 1995 to analyse the convergence in urban inequality in two different levels: the intra-provincial and intra-city inequality. Using a decomposition analysis, they show a general trend of rising and converging intra-provincial inequality. However, the mean earnings per worker and mean household income per capita, while rising in each province, show a diverging trend across provinces.

[17] Using 1988 and 1995 CASS national household cross-section surveys on ten provinces, Khan, Griffin and Riskin (2001) show that urban inequality has increased. The basic problem is that government policies have failed to address urban issues such as urban poverty, social safety nets, ration coupons, subsidies, housing, and inequality due to marketization (Khan, Griffin and Riskin 2001: 131).

[18] Using the same dataset as Khan, Griffin and Riskin (2001), Gustafsson and Li (2001) show that while overall inequality increased in 1995, also intra-rural, intra-urban, rural-urban, and inter-regional inequality increased as well.

during the second period may have been largely driven by financial expansion induced by the monopoly banking system.

8   Conclusion

Using China as a case, we show in this paper how financial intermediation affects the rural-urban inequality disparity (RUID). We argue that the monopolized banking market structure and central government regulations with regard to rural economy may affect the formal financial agencies' efficiency and incentive to provide financial support to rural sectors. On the one hand, the central government has increased its reliance on the banking system since late the 1980s as an instrument to regulate the economy more than other fiscal measures. On the other hand, due to strict regulation, informal financial agencies in rural areas are under-funded. As a result, the development of financial intermediation in China may enlarge the gap between rural versus urban financial development.

To support the above argument, we use panel data for 28 provinces for the period of 1978-98 to empirically test the relationship between the development of financial intermediation and RUID in China. We show that the urban-biased development of financial intermediation contributes significantly to the RUID increase. The results are robust to the controls for the endogeneity issues.

We also analyse the dataset by dividing it into two subperiods, 1978-88 and 1989-98. While central government used fiscal measures to regulate the economy in the first period, the focus shifted to an increased use of its banking system during the second period. We show that the Kuznets curve, a negative relationship between the squared GDP and RUID, may have occurred during the 1978-88, a decade of rapid agricultural growth and the development of the TVEs. However, the effect changed during the years 1989-98, a decade of high urban growth and urban inequality. Both urban-biased financial intermediation and limited liquidity in rural areas in unison may have changed the fundamentals of RUID. Moreover, we find neither the interaction term of the provincial financial intermediation loan ratio with the size of the modern sector nor the interaction term of the loan ratio with the size of non-state industrial production to be significant in explaining RUID. These statistical results also remain stable after controlling for potential structural differences between the three municipalities and other provinces. This study adds to the literature on economic inequality by clarifying the effects of government policies on the underlying dynamics of the convergent and divergent effects on rural-urban inequality.

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Appendix 1: Financial structure in China during the 1990s

The most important characteristic of China's centralized financial structure is its highly controlled and monopolized bank-based financial structure that is concentrated in urban areas. Small- and medium-scale farmer households and small- and medium- scale township and village enterprises are overlooked in the system.

The securities market plays a relatively minor role in financing the overall economy of China and is still underdeveloped. For example, although growth of the securities market has been faster than that of financial intermediation during the entire 1990s, China still maintains a bank-based financial structure in which the four state-owned commercial banks together account for two-thirds of financial assets and provide more than six times the funds that securities market does (IFC 2000).

The credit market in China is dominated by the four big SCBs (Table 2). Among these state-owned commercial banks, only the Agricultural Bank of China (ABC) is vested with the responsibility of providing loans to the agricultural sector. But in practice, farmers do not get financial support directly from ABC; instead, farm loans are handled by the rural credit cooperatives rather than the ABC.

The state monopolized banking market structure has been a convenient vehicle for the central government to direct credits to large SOEs (Zhang 2002).[19] Furthermore, given the imperfect credit monitoring system in China, smaller financial institutions enjoy an informational advantage over large banks when it comes to lending to the SMEs (Levonian and Soller 1995; Berger and Udell 1995; Peek and Rosengren 1996; Strahan and Weston 1996, 1998). Empirical researchers also find that large banks have no comparative advantage in providing funds to SMEs (Lin, Zhang and Liu 2003; Meyer 1998). Since agricultural activity is hard to supervise, the problem of asymmetry of information between farmers and financial intermediation are more severe. In such cases, large banks are unwilling to provide loans to farmers or TVEs, which normally are of medium- or small-scale and lack reliable credit history. In contrast, large enterprises, usually concentrated in the urban areas, can get financial resources more easily from the large banks. This means that even if government regulations on financial intermediation were removed, the urban bias of financial intermediation would not disappear.

The state monopolized banking market structure, however, gas experienced a declining budgetary capacity and has lost control over its resources since the 1980s. In order to finance its policies, and to support SOEs, central government extended its control over the financial system, which includes measures such as maintaining the interest ceiling, providing policy loans, and introducing a quota system in the securities market (abolished in 2001).

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[19] China's highly monopolized bank-based financial structure has a long history. From 1949 to 1952, China nationalized the whole banking industry and closed financial markets. All banks were merged with the People's Bank of China, the only bank left on mainland China, so that credit allocation was highly centralized in order to be easily assigned to priority sectors based on the national development strategy. Banking industry reform in the early 1980s led to the establishment of the four state-owned commercials banks, which have dominated financial intermediation market since then. A highly monopolized banking market structure makes it possible and easy for the government to exert control over the banking industry to direct the allocation of loans (Zhang 2002).

The level of financial development in China was relatively low during the 1980s, with bank deposits constituting the only financial assets. At that time, in order to promote reform and adjust its economy, the government saw no other choice but to rely mainly on fiscal policy such as raising the prices of principal agricultural products in 1979, increasing salaries and subsidies to urban residents, and providing low-cost or even no-cost resources to finance SOEs.

But the situation changed substantially later in the decade. After implementing a series of decentralizing reforms on the fiscal system and on SOEs in the 1980s, the government's possibility to use fiscal policy to adjust its economy was limited. The financial system, however, is still under tight regulation and controls are used by the state as a means of providing financial support to the large SOEs,[20] most of which are capital-intensive and large-scale firms.[21] In addition, government fiscal ratio to GDP at the province level has been declining since the beginning of the reform (Figure 3), and cheap bank loans (as well as equity market funds in the late 1990s) have become the principal tool of the cash-strapped government to support state-owned enterprises.[22]

Figure 4 shows that during the 1980s, there was a positive correlation between the loans by financial intermediation and per capita GDP (*FINDEV*) at the province level, which is consistent with the results in the literature in the context of cross-country comparison. It was during the 1990s that the credit lending level in the lowest-income provinces began to raise. It is likely that in the relatively underdeveloped provinces, financial intermediation was used as the primary tool by local governments for economic intervention.

With more funds being directed by the government to meet the financial demands of the large SOEs, it is obvious that farmers and TVEs were more financially constrained, which would be detrimental to RUID.

Appendix 2: Government regulations on the rural financial system

Relying on the four state-owned commercial banks that dominate the banking market, the government has been successfully in directing most of the credit to the large SOEs. Rural finance is handled by the formal financial agencies in the countryside, such as the ABC and the RCCs, which are responsible for providing financial services to farmers.

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[20] According to the IFC report (2000), in the period from 1991-97, the share of investment in the national total was in the range of 15-27 per cent, with scant resources targeted to formal bank loans (less than 1 per cent of working capital loans went to private sectors). In addition, private-firm access to the equity market was also restricted by requirements on size and the quota system. The IFC (2000) reports that out of the 976 companies listed on the Shanghai and Shenzhen Stock Exchanges, only 11 are non-state firms, while in 1998 and 1999 only 4 non-state IPOs (initial public offerings) took place.

[21] For example, the State Economy and Trade Commission was set up in the early 1990s to cooperate with State Planning Commission of China and the Ministry of Finance of China to implement industrial policies. The most famous policy is the so-called 'guarantee big firms and leave tiny firms alone', with its key goal to guarantee the development of the 500 super-big firms selected by the State Economy and Trade Commission and State Planning Commission of China.

[22] Until 2000, SOEs still accounted for over one-half of outstanding bank credit.

Hampered by regulations and government disincentives, these agencies are ineffective.[23] These disincentives take two forms.

First, although market reform has made great progress in the countryside, the central government regulations imposed on rural society and economy—such as compulsory grain procurement, family planning and nine-year compulsory education—are still maintained. This not only adds to the burden of the peasants, but also prevents them from exploiting their comparative advantage through production structure adjustment (Tao, Liu and Zhang 2003). Consequently, these regulations may increase the likelihood of low returns from agriculture.

Policy trends in the countryside prior to the mid-1980s could be viewed as market-oriented or deregulation-oriented. These included measures such as abolishing the commune system, promoting the household responsibility system, giving farmers more autonomy to manage production, relinquishing control over prices of many agricultural products (except grain and cotton), opening agricultural products markets and factor markets, and even an one-time attempt to cancel the compulsory procurement of grain. These measures were accompanied by rapid economic growth, but the good times did not last. Since the late 1980s, many of those pro-agricultural policies have been gradually reversed. We can see the change by tracking the grain policy in the 1990s. In 1990 the contract sale of grain was replaced with compulsory government procurement so that in practice contracted grain sales became mandatory for the peasants; in 1994, procurement and wholesale grain purchases were exclusively managed by state-owned grain firms; in 1995 the central government initiated reform of the food circulation system and began to stress food autarky within the provinces. All of these policies intensified the impact of the regulations on the rural economy.

Second, since the late 1980s, in order to improve their promotion possibilities, local officials became interested in various 'image projects', including the establishment of industrial firms regardless of local conditions or local comparative advantage. In reality, many of these firms proved to be loss-making, and since many had been started with bank loans, they resulted in considerable bad debt.

The consequences are twofold: (i) having accumulated bad loans, the financial position of rural financial agencies became worse, and (ii) there was an outflow of rural financial resources for off-farm activities. Rural funds were not reinvested in agricultural sectors, but were instead diverted to real estate or equity markets in urban areas.[24] The outflow

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[23] Song (2000), for instance, points out that the average growth rate of total agricultural loans as a whole was less than 2 per cent per year. The ratio of new added agricultural loans to total loans was also less than 10 per cent. Chen (2002) finds in his survey that basic financial services for rural residents not only declined, but also that funds for productive and commercial activities were smaller than before. Moreover, because state-owned commercial banks have been closing down their county-level branch offices in the late 1990s, the RCCs alone cannot assume responsibility for providing financial services for rural development because of its large portfolio of bad loans accumulated over last two decades. In Liu's (2002) survey on county finance, rural financial agencies were concerned over the huge bad loans and tremendous losses. He concludes that because credit policies were tightened after stated-owned banks were commercialized, county-level economic activities are more constrained financially.

[24] He (2003) summarizes the channels of outflow of rural funds. One such channel is through the branch offices of state-owned commercials banks, and rural post-office saving banks pooling funds for deposit with higher level banks. Rural funds also flow out through the RCCs every year, in the form of deposit reserves going to the central bank, the purchase of public debts and financial bonds, etc. He

of funds from the countryside was particularly prominent around the year 1994 when the Chinese economy overheated. But once the macroeconomic policy environment tightened after 1994, the majority of funds invested in real estate and equity market turned into bad debt.

Even on the part of loans intended for agricultural sectors, scant amounts were actually received by the farmers. The Agricultural Bank of China, for instance, has no face-to-face contact with the farmers, but prioritizes its business instead with the state-owned agricultural commercial firms and the TVEs. ABC loans are mainly used for large infrastructure projects, purchasing public debts, and protecting the environment. But for the agricultural enterprises in urgent need of financial support, ABC loans have been retrograding (Chen 2002). The rural credit cooperatives of China are another formal financial agency lending directly to farm households. However, the role of the RCCs in meeting the farmers' financial demand is limited for several reasons. First, the RCCs are only 'cooperative' in the nominal sense; in practice, these still operate as a state-owned agency. Thus their operations are often government directed so that they fund ventures rather than provide financial services to agriculture and farmers. Loans provided through administrative intervention usually become bad loans in the end, greatly damaging the financial position of the RCCs. According to the estimate of the People's Bank of China (PBC), the RCCs' portfolio of accumulated bad loans has reached hundred one billion *yuan* and the non-performing loan (NPL) rate is much higher than that of the four state-owned commercial banks. Usually the NPL ratio is above 50 per cent, but in some economically underdeveloped provinces, it exceeds 90 per cent. Furthermore, because of the commercialization reform, the RCCs pay more attention in their operations to loan quality and profit orientation. Because the relative returns on agricultural activities are kept artificially low, the RCCs have no actual incentive to extend loans to the sector, as is indicated by its minimal loans targeted to the rural economy. Many case studies also indicate that regardless of their location in the economically developed regions and coastal provinces, or in the central and western hinterlands, the RCCs show a strong urban bias in their loan orientation.[25] Finally, the RCCs have a monopolistic position in the rural financial markets, thus they lack the incentive to improve management or control financial risks.

It is difficult for the farmers to obtain adequate financial services from the formal financial agencies, so they primarily turn to the informal channels. Based on data from a rural fixed point survey, which cover 20,294 farm households, Cao (2002) notes that in 1999, rural informal credit market accounted for 69.41 per cent of total loans borrowed, averaging 1008.56 *yuan* per household.

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estimates that in 2001 funds flowing out from the countryside via state-owned commercial banks and post banks totalled 30 billion *yuan* and 59.11 billion *yuan*, respectively. Ma (2001: 133) also estimates that about 20 billion *yuan* per year have left the countryside since the 1990s.

25 According to IFDA (2002), the RCCs covered only 20 per cent of loans of the poorest farmers. Many case studies also note that the RCC operations are exhibiting greater urban bias, with more loans going to urban areas, more city-residents being hired as employees, and more subsidiaries being located in towns. This is true, regardless of whether the RCCs were located in the highly developed regions or the inner-country provinces or some of eastern provinces where agriculture constitutes the comparative advantage (Sheng 2001).

However, concerned over the financial risks involved, monetary authorities are dubious of the development of informal finance, and are even opposing it. For example, the rural credit foundations (RCFs), an informal financial agency active in rural areas, was ordered to discontinue operations in 1999, which led to a gap of 300 billion yuan between monetary supply and demand in the countryside (Chen 2002).

Overall, in the early 1980s, when regulations on rural economy were eased off, output of grain production and net income per capita of peasants increased rapidly.[26] As a result, RUID dropped during this period (Figure 1).

However, since the mid-1980s, the effect of pro-agriculture institutional reforms was exhausted, while other policies detrimental to rural economic development essentially were not changed at all. With regard to financial development, most credit was allocated to the large SOEs through the state-owned banking system. In contrast, both the highly monopolized banking market structure and artificially low return of agriculture have had a negative impact on the farmers' ability to secure funds from the formal financial institutions. Furthermore, these formal financial agencies have, in fact, become the channel of funds flowing out from the rural areas. Even these non-official financial agencies are under strict regulation so that they are unable to provide sufficient financial services to farmers. Thus, overall financial development in China will probably mean that the gap between rural financial development and urban financial development is widening, and as a result, RUID has increased. As shown, the Chinese government has relied more and more on the financial system to intervene in the economy since the 1990s.

Appendix 3: Definition of the variables and data sources

Dependent variable

RUID ratio of urban per capita disposable income to rural per capita net income.

Explanation variables:

PERGDP	real per capita GDP at provincial level;
FINDEV	ratio of loans extended by financial intermediation in one province to its GDP;
AGRFINDEV	share of loans to agriculture sectors in total loans;
REFORM	the proportion of farm households that adopt household responsibility system in a province;
EXPORT/GDP	ratio of total value of export to GDP at province level;
FDI/GDP	ratio of FDI to GDP at province level;

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[26] According to the calculations of the authors, the growth rate of agriculture and net income per capita of the peasants (in 1950 prices) averaged 7.7 per cent and 14.4 per cent per year, respectively, for the period of 1978-84. Lin *et al.* (1988) find agricultural TFP (total factor productivity) increased considerably versus the pre-reform periods.

FISCAL_AGR   share of fiscal funds for supporting agricultural production in total fiscal expenditures;

FISCAL/GDP   ratio of fiscal expenditures to GDP;

AGR/GDP   share of primary industry's GDP in total GDP at province level;

PD   provincial dummy = 1 if provinces are Beijing, Shanghai and Tianjin; otherwise = 0.

Data sources

The Compilation of Statistic Data of New China for 1978-1999. Beijing: Chinese Statistics Press (2000).

Mingxing Liu (2002) 'Data for Chinese Economic Growth and Development: 1970-1998'. Available at: www.fed.org.cn.

Figures and tables

Figure 1 shows that provincial level rural-urban income disparity declined in the early 1980s, but increased again from the late 1980s onward.

Figure 1
Rural-urban income inequality across provinces (1978-98)
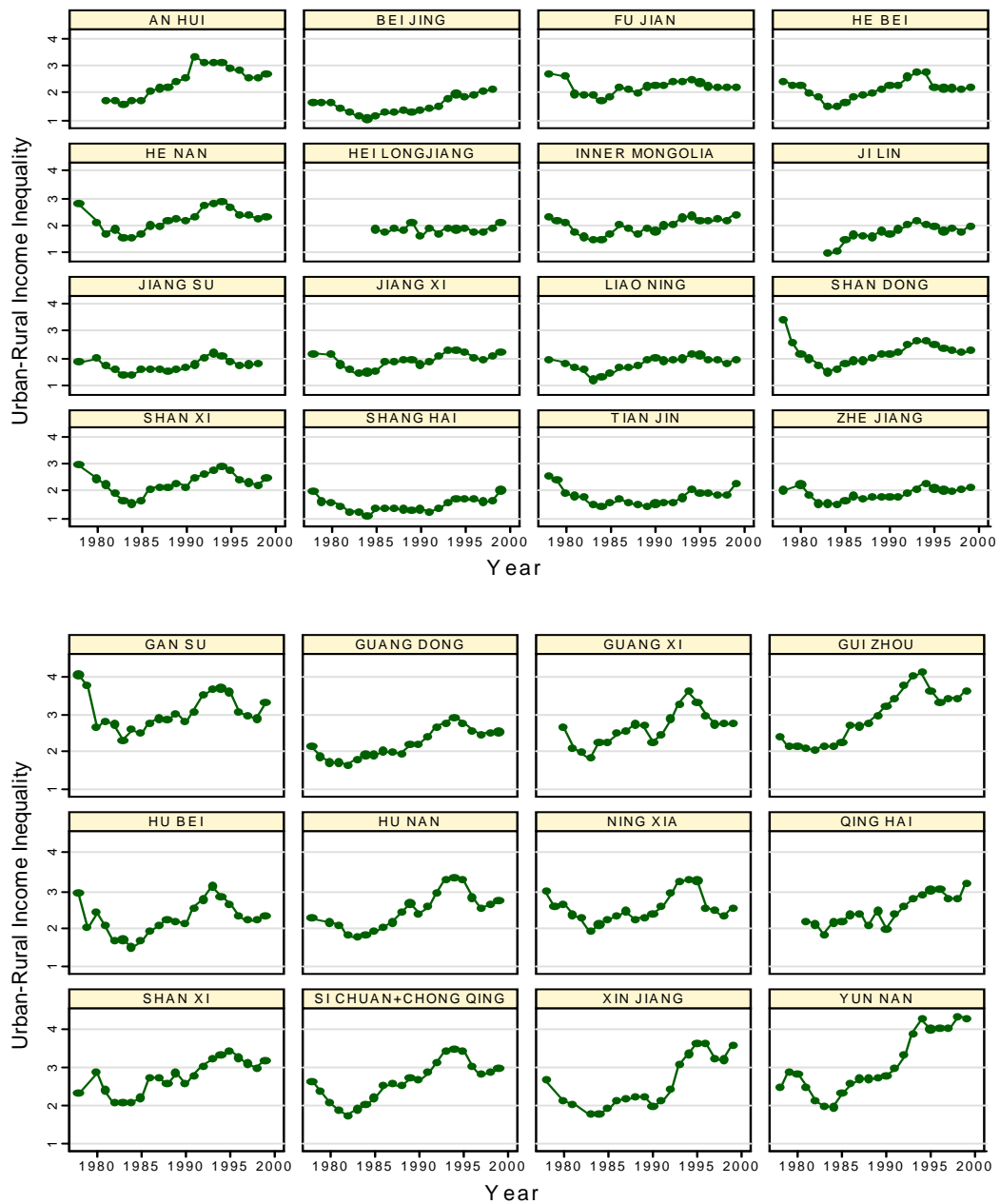
Note: RUID is measured as the ratio of urban disposal income per capita to the rural per capita net income.

Source: CSB (2000).

Figure 2 shows a negative correlation between the average rural-urban income inequity and average per capita income at the province level.

Figure 2
Average rural-urban income inequality and average per capita income (province level, 1978-99)
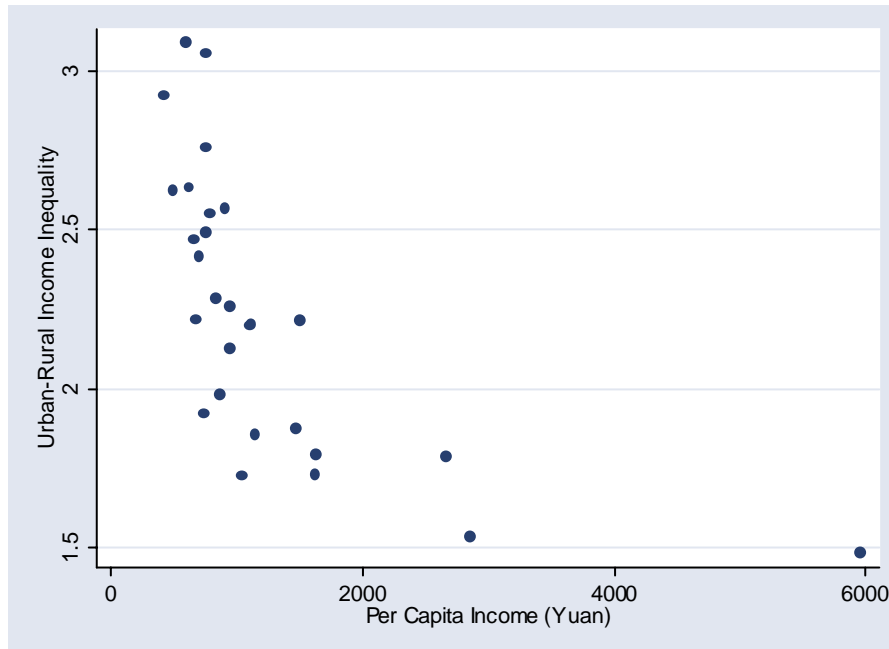
Source: CSB (2000).

Figure 3 shows that the ratio of government revenue to GDP at the province level has been declining since the beginning of reforms.

Figure 3
Ratio of government revenue to GDP at province level
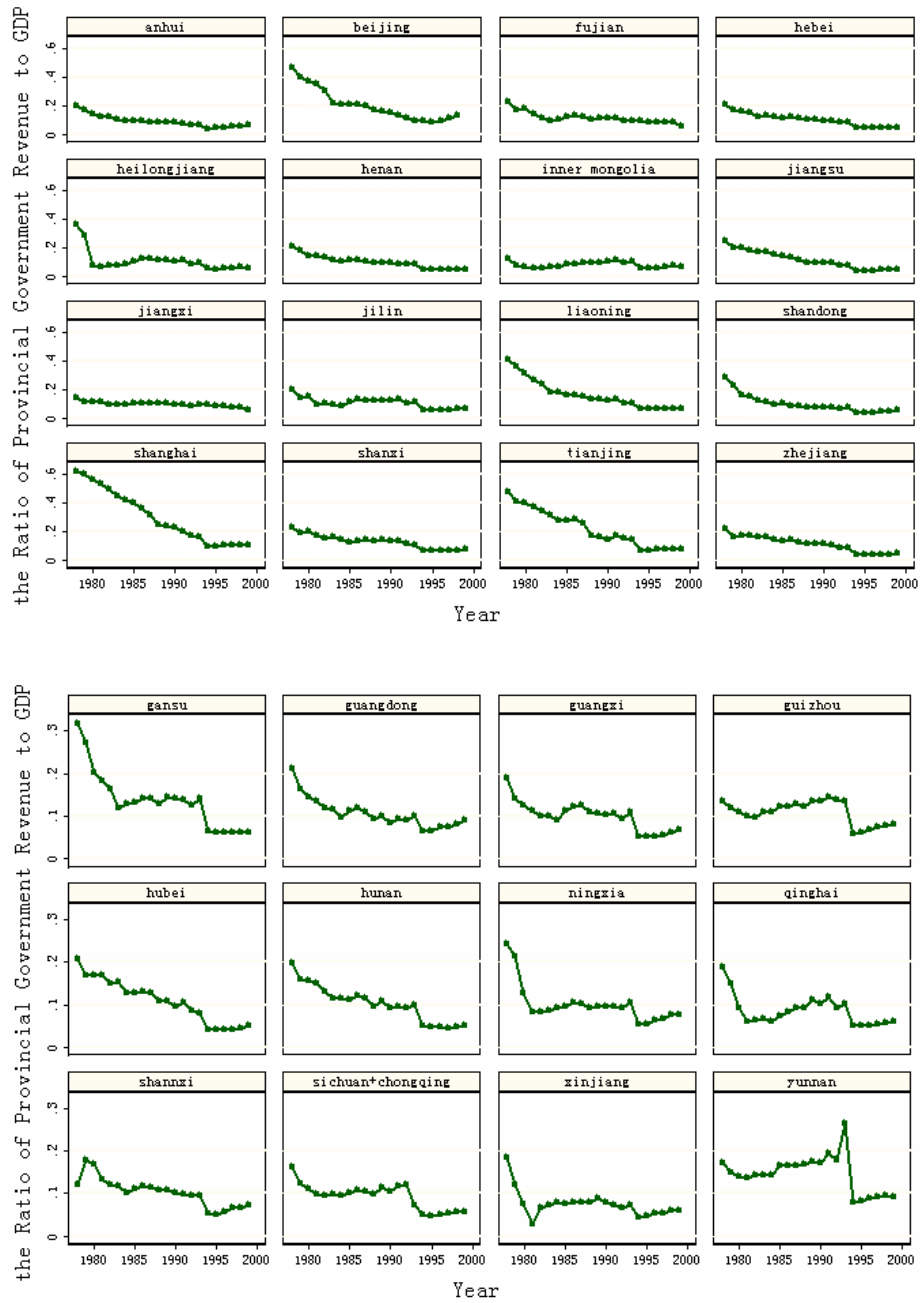
Figure 4
Per capita GDP and the development of financial intermediation at province level
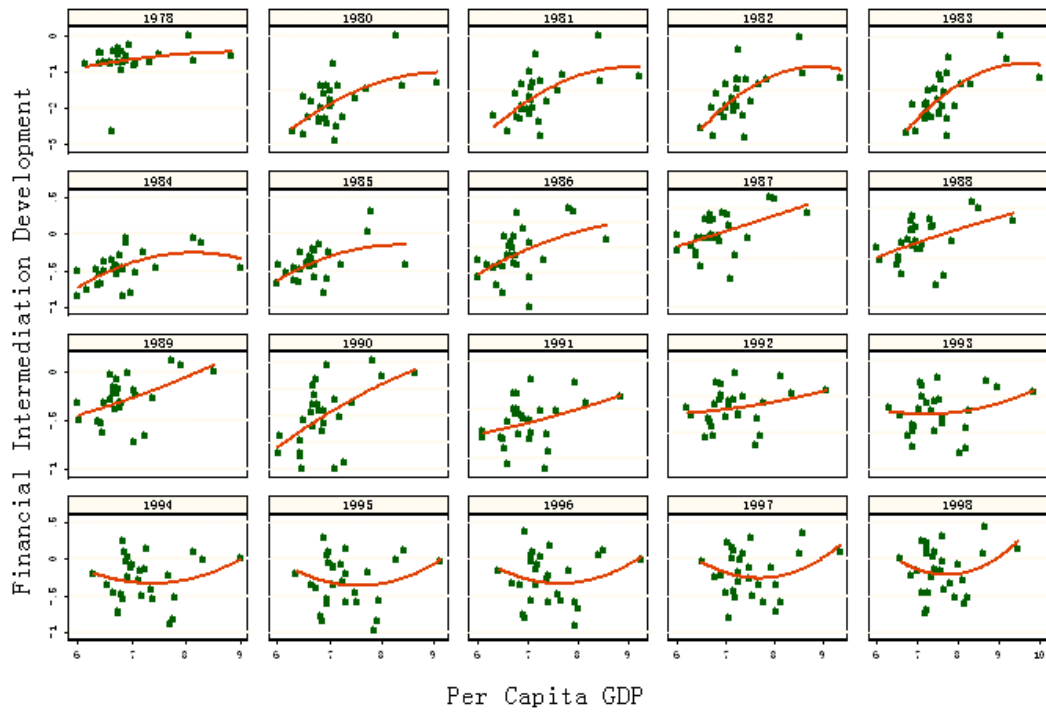
Note: Development of the financial intermediation index is measured as the logged value of the ratio of loans of state financial intermediation to GDP in a province; per capita GDP is also in logarithmic forms.

Source: CSB (2000).

Table 1
Do the four state-owned commercial banks matter? Banking market structure in China (%)

	Industrial and Commercial Bank of China	Agricultural Bank of China	Bank of China	Construction Bank of China	Total
Proportion of asset value in total asset value of banks in China					
1994	34.18	16.26	23.85	18.13	92.42
1996	34.59	13.98	20.08	20.26	88.92
1997	34.13	13.69	19.04	26.33	93.19
Proportion of profit value in total profit value of banks in China					
1994	19.4	2.41	24.82	12.8	59.43
1996	12.73	10.25	25.36	10.59	58.93
1997	11.04	2.84	21.25	6.79	41.92
Proportion of deposit in total deposit of banks in China					
1996	27.37	13.11	18.02	15.39	73.89
1997	27.32	13.47	16.7	15.89	73.38
Proportion of loans in total loans of banks in China					
1996	28.03	13.34	16.54	14.22	72.13
1997	26.63	13.09	15.05	14.8	69.57

Source: CCER (2000).

Table 2
Descriptive statistics (average values, 1978-98)

	RUID	PERGDP	FINDEV	AGRFINDEV	FISCAL_AGR	REFORM	EXPORT/GDP
Mean	2.21	1193.6	0.74	0.09	0.02	0.80	0.11
MAX	3.04	5652.5	1.08	1.04	0.05	0.86	0.45
MIN	1.45	400.3	0.45	0.01	0.002	0.69	0.03
Std dev.	0.44	1055.8	0.16	0.19	0.01	0.03	0.10
Observations	27	27	27	27	27	27	27

Table 3
Financial intermediation and ln(*RUID*)
Baseline model (1978-98, full sample)

	OLS	SYS-GMM	OLS	SYS-GMM
Ln(*PERGDP*)	0.74***	0.73**	1.02***	0.99**
	(4.38)	(2.15)	(4.45)	(2.46)
Ln(*PERGDP*)^2	-0.05***	-0.05**	-0.07***	-0.07**
	(4.34)	(2.17)	(4.64)	(2.73)
FINDEV	0.14***	0.14	0.24***	0.22*
	(2.27)	(1.44)	(3.59)	(1.96)
AGRFINDEV	0.27	0.25	0.24	0.16
	(1.12)	(0.60)	(1.01)	(0.37)
REFORM			-0.10*	-0.09
			(1.80)	(1.59)
EXPORT/GDP			0.07	0.08
			(1.09)	(0.75)
FDI/GDP			0.76*	0.72
			(1.90)	(1.42)
FISCAL_AGR			-0.23	-0.19
			(0.94)	(0.67)
FISCAL/GDP			0.82***	0.86**
			(3.29)	(2.28)
Obs	506	506	490	490
Adj-R^2	0.89		0.90	
Hansen test sig		1.00		1.00
AR(2) test sig		0.38		0.16

Notes: Numbers below estimated coefficients are robust standard errors.

*, **, *** indicate significance at 10%, 5%, 1% significant level.

RUID is the ratio of urban per capita disposable income to rural per capita net income;

PERGDP is the real per capita GDP at provincial level;

(Ln(*PERGDP*))^2 is the square term of Ln(*PERGDP*);

FINDEV is the ratio of loans extended by financial intermediation in one province to its GDP:

AGRFINDEV is the share of loans to agriculture sectors in total loans;

REFORM is the proportion of farm households that adopt household responsibility system in a province;

EXPORT/GDP is the ratio of total value of export to GDP at province level;

FDI/GDP is the ratio of foreign direct investment to GDP at province level;

FISCAL_AGR is the share of fiscal funds for supporting agricultural production in total fiscal expenditures;

FISCAL/GDP is the ratio of fiscal expenditures to GDP.

Table 4
Financial intermediation and ln(*RUID*):
Subsample model (1978-89)

	OLS	SYS-GMM	OLS	SYS-GMM
Ln(*PERGDP*)	1.54***	1.67***	1.80***	1.88***
	(5.90)	(3.73)	(5.44)	(3.91)
Ln(*PERGDP*)^2	-0.12***	-0.13***	-0.14***	-0.15***
	(6.45)	(4.30)	(6.10)	(4.59)
FINDEV	0.02	0.01	0.03	0.01
	(0.29)	(0.11)	(0.32)	(0.07)
AGRFINDEV	0.40	0.51	0.31	0.22
	(1.34)	(1.45)	(1.04)	(0.72)
REFORM			-0.08*	-0.07*
			(1.75)	(1.69)
EXPORT/GDP			-0.43*	-0.55**
			(1.66)	(2.15)
FDI/GDP			2.65**	3.02**
			(2.26)	(2.50)
FISCAL_AGR			-0.35**	-0.35*
			(2.03)	(1.85)
FISCAL/GDP			0.89***	0.83**
			(3.05)	(2.23)
Obs	268	268	254	254
Adj-R^2	0.90		0.91	
Hansen test sig		1.00		1.00
AR(2) test sig		0.66		0.88

Notes: See Table 3.

Table 5
Financial intermediation and ln(*RUID*)
Subsample model (1990-98)

	OLS	SYS-GMM	OLS	SYS-GMM
Ln(*PERGDP*)	-1.37*** 4.61	-0.97*** 3.59	-1.04*** 3.22	-0.94** 2.26
Ln(*PERGDP*)^2	0.09*** 5.14	0.07*** 3.72	0.07*** 3.54	0.06** 2.59
FINDEV	0.38*** 4.71	0.40*** 3.75	0.43*** 4.96	0.32** 2.62
AGRFINDEV	-0.89* 1.96	-0.56 0.69	-0.50 1.02	-0.49 0.58
REFORM			-- --	-- --
EXPORT/GDP			-0.02 0.30	0.01 0.11
FDI/GDP			0.87** 2.28	0.74 1.62
FISCAL_AGR			-4.36 0.94	-3.98 0.87
FISCAL/GDP			0.16 0.51	0.30 0.67
Obs	238	238	236	236
Adj-R^2	0.95		0.95	
Hansen test sig		1.00		1
AR(2) test sig		0.46		0.50

Notes: Numbers below estimated coefficients are robust standard errors;

     *, **, *** indicate significance at 10%, 5%, 1% significant level:

    RUID is the ratio of urban per capita disposable income to rural per capita net income;

    PERGDP is the real per capita GDP at provincial level;

    (Ln(*PERGDP*))^2 is the square term of Ln(*PERGDP*);

    FINDEV is the ratio of loans extended by financial intermediation in one province to its GDP:

    AGRFINDEV is the share of loans to agriculture sectors in total loans;

    REFORM is the proportion of farm households that adopt household responsibility system in a province;

    EXPORT/GDP is the ratio of total value of export to GDP at province level;

    FDI/GDP is the ratio of foreign direct investment to GDP at province level;

    FISCAL_AGR is the share of fiscal funds for supporting agricultural production in total fiscal expenditures;

    FISCAL/GDP is the ratio of fiscal expenditures to GDP.

Table 6
Financial intermediation and ln(*RUID*):
Considering economic structure in the model

	Full sample		Subperiod: 1978-89		Subperiod: 1990-98	
	OLS	SYS-GMM	OLS	SYS-GMM	OLS	SYS-GMM
Ln(*PERGDP*)	0.15	0.12	1.43***	1.66**	-1.73***	-1.50***
	0.57	0.29	3.02	2.61	6.17	6.58
Ln(*PERGDP*)^2	-0.03	-0.02	-0.12***	-0.15***	0.10***	0.09***
	1.49	0.88	3.62	3.05	6.04	5.90
FINDEV	0.21*	0.20	0.16	0.23	0.43***	0.47***
	1.79	1.34	1.17	1.48	4.80	3.63
AGR/GDP	-2.04***	-2.07***	-1.01**	-0.85	-1.80***	-2.0***
	6.71	5.21	2.06	1.38	4.59	4.02
*AGR/GDP*FINDEV*	0.60	0.59	-0.31	-0.73	-0.15	-0.13
	1.62	1.16	0.52	0.96	0.46	0.29
AGRFINDEV	0.31	0.21	0.29	0.15	-0.34	0.09
	1.29	0.53	0.99	0.49	-0.62	0.15
REFORM	0.00	0.01	-0.03	0.00		
	0.08	0.29	0.60	0.15	.	
EXPORT/GDP	0.04	0.04	-0.66**	-0.83***	-0.08	-0.08
	0.60	0.40	2.37	3.88	0.99	0.87
FDI/GDP	1.16***	1.13**	3.45***	3.91***	1.23***	1.27
	2.94	2.14	2.95	3.29	3.41	3.15
FISCAL_AGR	-0.10	-0.04	-0.37*	-0.40*	-4.57	-6.87*
	0.44	0.17	1.95	1.94	1.15	1.73
FISCAL/GDP	0.69***	0.73**	0.64**	0.54	-0.16	-0.14
	2.91	2.40	2.04	1.62	0.90	0.73
Obs	470	470	243	243	227	227
Adj-R^2	0.91		0.92		0.96	
Hansen test sig		1.00		1.00		1.00
AR(2) test sig		0.25		0.84		0.37

Notes: Numbers below estimated coefficients are robust standard errors;

*, **, *** indicate significance at 10%, 5%, 1% significant level:

RUID is the ratio of urban per capita disposable income to rural per capita net income;

PERGDP is the real per capita GDP at provincial level;

(Ln(*PERGDP*))^2 is the square term of Ln(*PERGDP*);

FINDEV is the ratio of loans extended by financial intermediation in one province to its GDP:

AGRFINDEV is the share of loans to agriculture sectors in total loans;

REFORM is the proportion of farm households that adopt household responsibility system in a province;

EXPORT/GDP is the ratio of total value of export to GDP at province level;

FDI/GDP is the ratio of foreign direct investment to GDP at province level;

FISCAL_AGR is the share of fiscal funds for supporting agricultural production in total fiscal expenditures;

FISCAL/GDP is the ratio of fiscal expenditures to GDP;

AGR/GDP is the share of primary industry's GDP in total GDP at province level;

*(AGR/GDP)*FINDEV* is the interaction term between AGR/GDP and FINDEV.

Table 7
Financial intermediation and ln(*RUID*):
Considering structural differences between provinces (I)

	Full sample		Subperiod: 1978-89		Subperiod: 1990-98	
	OLS	SYS-GMM	OLS	SYS-GMM	OLS	SYS-GMM
Ln(*PERGDP*)	0.07	0.07	-0.26	-0.27	-0.92***	-0.82*
	(0.25)	(0.14)	(0.36)	(0.27)	(2.76)	(1.89)
Ln(*PERGDP*)^2	-0.01	-0.01	0.01	0.01	0.05***	0.04*
	(0.70)	(0.40)	(0.10)	(0.08)	(2.59)	(1.75)
FINDEV	0.20***	0.20*	0.16	0.16	0.43***	0.29**
	(2.70)	(1.77)	(0.80)	(1.03)	(3.97)	(2.07)
*PD*FINDEV*	-0.08	-0.08	-0.52*	-0.52*	-0.02	0.10
	(0.53)	(0.42)	(1.91)	(1.78)	(0.16)	(0.60)
PD	-0.39*	-0.26	0.37	0.44	0.12	-0.08
	(1.81)	(0.72)	(0.84)	(1.33)	(0.70)	(0.38)
AGRFINDEV	-0.09	-0.09	-0.16	-0.16	-0.32	-0.33
	(0.29)	(0.15)	(0.53)	(0.50)	(0.58)	(0.38)
REFORM	-0.32*	-0.32	-0.31*	-0.31*		
	(1.73)	(1.52)	(1.75)	(1.74)	.	
EXPORT/GDP	0.03	0.03	0.18	0.18	-0.07	-0.02
	(0.49)	(0.38)	(0.65)	(0.60)	(0.72)	(0.18)
FDI/GDP	0.56	0.56	-3.06**	-3.06**	1.09***	1.08*
	(1.47)	(1.06)	(2.01)	(2.22)	(2.67)	(2.38)
FISCAL_AGR	-3.94	-3.94	2.13	2.13	0.38	-0.78
	(1.10)	(0.87)	(0.65)	(0.63)	(0.09)	(0.17)
FISCAL/GDP	0.85	0.85	1.43*	1.43*	0.15	0.25
	(1.57)	(1.26)	(1.80)	(2.00)	(0.41)	(0.52)
Obs	370	370	134	134	236	236
Adj-R^2	0.93		0.95		0.95	
Hansen test sig		1.00		1.00		1.00
AR(2) test sig		0.19		0.10		0.45

Notes: Numbers below estimated coefficients are robust standard errors;

 *, **, *** indicate significance at 10%, 5%, 1% significant level:

RUID is the ratio of urban per capita disposable income to rural per capita net income;

PERGDP is the real per capita GDP at provincial level;

(Ln(*PERGDP*))^2 is the square term of Ln(*PERGDP*);

FINDEV is the ratio of loans extended by financial intermediation in one province to its GDP:

AGRFINDEV is the share of loans to agriculture sectors in total loans;

REFORM is the proportion of farm households that adopt household responsibility system in a province;

EXPORT/GDP is the ratio of total value of export to GDP at province level;

FDI/GDP is the ratio of foreign direct investment to GDP at province level;

FISCAL_AGR is the share of fiscal funds for supporting agricultural production in total fiscal expenditures;

FISCAL/GDP is the ratio of fiscal expenditures to GDP;

PD is the dummy variable for three municipalities;

*PD*FINDEV* is the interaction term of PD and FINDEV.

Table 8
Financial intermediation and ln(*RUID*):
Considering structural differences between provinces (II)

	Full sample		Subperiod: 1978-89		Subperiod: 1990-98	
	OLS	SYS-GMM	OLS	SYS-GMM	OLS	SYS-GMM
Ln(*PERGDP*)	-0.69***	0.16	-0.31	-0.31	-1.52***	-0.70
	(2.62)	(0.31)	(0.36)	(0.28)	(4.85)	(0.54)
Ln(*PERGDP*)^2	0.02	-0.02	-0.01	-0.01	0.07***	0.03
	(1.24)	(0.56)	(0.17)	(0.13)	(4.00)	(0.35)
FINDEV	0.13	0.49*	0.30	0.30	0.45**	0.56**
	(0.87)	(1.94)	(0.72)	(0.80)	(2.42)	(2.11)
*PD*FINDEV*	0.08	-0.06	-0.52	-0.52	0.00	0.13
	(0.43)	(0.20)	(1.06)	(1.07)	(0.01)	(0.47)
PD(AGR/GDP*FINDEV)*	-2.60***	-0.75	-2.73	-2.73	-0.92	-1.02
	(2.66)	(0.32)	(1.15)	(1.23)	(0.89)	(0.29)
*AGR_GDP*FINDEV*	0.55	0.0006	-0.57	-0.57	-0.24	0.01
	(1.11)	(0.00)	(0.39)	(0.40)	(0.40)	(0.01)
PD	-0.12	-0.55***	0.67	0.67	-0.62***	-0.42
	(0.57)	(2.82)	(1.10)	(1.11)	(3.53)	(1.23)
AGR/GDP	-2.44***	-2.06***	-0.44	-0.44	-1.79***	-2.44***
	(6.05)	(3.88)	(0.33)	(0.31)	(3.32)	(3.08)
AGRFINDEV	0.09	0.25	-0.15	-0.15	-0.15	1.08
	(0.30)	(0.61)	(0.50)	(0.59)	(0.24)	(1.48)
REFORM	-0.04	0.21	-0.12	-0.12		
	(0.22)	(0.96)	(0.59)	(0.51)	.	
EXPORT/GDP	0.04	-0.03	0.28	0.28	-0.12	-0.17
	(0.60)	(0.30)	(0.97)	(0.81)	(1.39)	(1.44)
FDI/GDP	0.69*	1.79***	-2.26	-2.26	1.32***	2.12***
	(1.98)	(3.43)	(1.47)	(1.49)	(3.43)	(8.13)
FISCAL_AGR	-2.29	-3.01	0.14	0.14	0.19	-5.51
	(0.73)	(0.80)	(0.05)	(0.05)	(0.05)	(1.12)
FISCAL/GDP	0.48	0.47	1.28*	1.28**	-0.16	-0.28
	(1.16)	(0.91)	(1.99)	(2.24)	(0.73)	(0.78)
Obs	357	357	130	130	227	227
Adj-R^2	0.95		0.96		0.96	
Hansen test sig		1.00		1.00		1.00
AR(2) test sig		0.73		0.23		0.64

Notes: See Table 7.