G-COE GLOPE II Working Paper Series

Between Mao and Markets: New Evidence on Segmentation of the Bank Loan Market in China

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Working Paper No.7

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Running Title: New Evidence on Segmentation of the Bank Loan Market in China

Abstract

This article examines the local bank lending's dependency upon local deposits within China in the Feldstein—Horioka vein. In the case of a transition economy like China, it would be appropriate to assume the presence of a significant level of disparity in the cost of funds between state-owned enterprises (SOEs) and non-SOEs. For this purpose, a dataset of the provincial deposit rates and the provincial loan rates for the state and the non-state sectors is built. Even after controlling the national- and province-specific shocks, the correlation between the local deposit rates and the local loan rates for the non-state sector, in contrast with that for the state sector, is even higher than for the OECD member countries. The findings suggest that serious asymmetric information problems between banks and non-SOEs might impede cross-regional lending and prevent the development of the non-state sector within China.

I. Introduction

China has maintained a remarkable growth rate since the outset of the reform program in the early 1980s. One of the probable engines of China's economic growth is its financial sector. Since the 1990s, there has been a growing consensus in the literatures, that 'Schumpeter might be right' (King and Levine, 1993). That is, development of the financial sector promotes economic growth, for instance, by reducing the disparity between the costs of internal and external funds (Rajan and Zingales, 1998), and promoting the responsiveness to shocks towards growth opportunities (Fisman and Love, 2004). Since the current Chinese financial system is dominated by a large banking sector and the role of the stock market in allocating financial resources in the economy has been limited[1], the features of the Chinese banking system have attracted much attention in recent years to gain an insight into its economic growth pattern.

From among a series of inter-related questions that need to be addressed, I focus on the following question: How much are Chinese intra-national bank loan markets integrated? Surprisingly, however, very few formal investigations have been conducted on domestic capital mobility within China. By way of exception, Boyreau—Debray and Wei (2004) (henceforth, BW) explores the segmentation of Chinese domestic capital markets by applying the modified version of the Feldstein—Horioka test (Feldstein and Horioka, 1980, henceforth, FH),

the standard approach used in literature on international finance. FH argues that, under perfect capital mobility, there exists no necessary association between national saving and investment, since financial resources can globally seek out the highest expected returns. A substantial amount of literature on this subject has expressed skepticism about the FH approach as a method of measuring international capital mobility for various reasons (see for instance, Coakley, 1998). Despite this, the FH test has been regarded as a reasonable approach to measure intra-national capital mobility (e.g. BW, 2004, Yamori, 1995).

An important drawback of BW (2004) is that it has not paid adequate attention to China's peculiarities as a transition economy[2]. In a transition economy like China, it would be appropriate to assume the presence of a significant level of disparity in the cost of funds between state-owned enterprises (SOEs) and non-SOEs If this is true, Chinese domestic capital markets would be segmented, not only on the basis of geographical units, but also the ownership form of the borrowers. Unfortunately, however, there is no satisfactory data that is available on loans decomposed on the basis of the borrower's ownership form, consistently published by China's national authorities. It is this lack of data that has prevented researchers from directly testing the above-mentioned hypothesis.

The aim of this article is straightforward. I measure the degree of

domestic capital mobility within the banking system, both in the state and the non-state sector in China. For this purpose, I develop a provincial-level panel data for deposits and loans decomposed on the basis of the borrower's ownership form using the method developed by Zhang et al. (2007), and apply a modified version of the FH test to the data.

II. Data and Methodology

The data set used in this article covers thirty-one Chinese provinces (or province-level autonomous regions or super-cities) on the mainland during 1999-2005. The sources of data are the *China Statistical Yearbook* (National Bureau of Statistics of China, various years), the *China Economic Census Yearbook-2004*, (The State Council of China, 2006), and the *China Financial Statistics (1949–2005)* (Beijing: Zhongguo jinrong chubanshe, 2007).

As mentioned above, since the panel data on bank lending decomposed on the basis of the borrower's ownership form are not published by China's national authorities on a consistent basis, I construct this data using the method developed by Zhang et al. (2007). Following them, consider eq. (1):

$$
\begin{aligned}
(\text{Loan/Local GDP})_{i,t} =& \beta_0 + \beta_1(\text{SOE Output/the Total})_{i,t} \\
&+ \beta_2(\text{SOE Output/the Total})_{i,t} \times (\text{Coast Dummy})_i \\
&+ \sum_i \delta_i(\text{Province Dummy})_i + \nu_{i,t} \qquad (1) \\
\nu_{i,t} =& \rho\nu_{i,t-1} + \epsilon_{i,t} \quad |\rho| < 1
\end{aligned}
$$

where the dependent variable is the total loan as a share of the provincial GDP for province *i* at time *t*, the independent variables are the industrial output share of SOEs and its interaction term with a dummy variable for the provinces located in the coastal region (that equals one if the province is located in the coastal region, and zero otherwise)[3], province-specific effects, and $\nu_{i,t}$ is the disturbance term. Furthermore, I specify a first order autoregressive process, AR (1), to correct for serial correlation in the disturbance term.

If bank loans are allocated to the state and the non-state sectors depending on their output share of the total, then $\hat{\beta}_1$*(SOE Output/the Total) or ($\hat{\beta}_1 + \hat{\beta}_2$)*(SOE Output/the Total) would capture the amount of loans to the state sector as a share of the provincial GDP. Note that the total bank loans should be classified into two components, that is, that issued to the state sector and the rest issued to the others. Then the outstanding amount of loans to the non-state sector (as a share of provincial GDP) can be obtained by deducting the values yielded by the estimated amount of loans to the state sector (as a share of the provincial GDP) from the total amount of loans (as a share of the

provincial GDP).

Table 1 reports the estimation results. The estimated signs of the output share of SOE are positive and significant at the 1 and 5 percent levels (row 1).

III. Empirical Tests

Table 2 reports the results. The averaged correlation between the deposit rates and the loan rates for the non-state sector is 0.91 (row 1). On the other hand, the corresponding figure for the state sector is practically zero (row 4). For the purpose of comparison, the correlation coefficients for the national economies of OECD member countries reported in BW (2004) are quoted (row 9). Surprisingly, the magnitude of the correlation across the OECD member countries (0.62) is much lower than that for the non-state sector in China. These comparisons suggest that the degree of domestic capital mobility within the banking system in the non-state sector, in contrast with that in the state one, is much lower than international capital mobility among the OECD member countries.

Figure 1 shows the local deposit rates and the local loan rates for the state sector (and the non-state sector) averaged over the years 1999-2005. As shown in Figure 1, the averaged values of deposit and loan rates for Beijing are relatively high. This could be due to the fact that the headquarters of the "Big Four" banks in China (Bank of China,

China Construction Bank, Industrial and Commercial Bank of China, and Agricultural Bank of China) are all located in Beijing. To remove its effects, I recalculate the simple correlation excluding Beijing, then the new coefficient for the non-state sector (the state sector) is 0.80 (0.06). The results remain practically unchanged.

Simple correlations, however, only provide a preliminary measure of the domestic integration of the bank loan market. National- and province-specific shocks that can affect the magnitude of correlation coefficients between deposit and loan rates, other than those owing to the integration of the bank loan market, should be controlled. I, therefore, apply the conditional FH test developed by Iwamoto and van Wincoop (2000) to the Chinese provinces to control for these factors[4].

The steps are as follows. First, I control for national and province-specific shocks by regressing the provincial deposit rates, the provincial loan rates for the state sector, and the provincial loan rates for the non-state sector on province-specific determinants that can affect co-movements between deposits and loans:

$$\begin{aligned}(\text{Loan Rate for SOEs})_{i,t} =& \alpha_0 + \alpha_Y(\text{Local Business Condition})_{i,t} \\ &+ \alpha_F(\text{Gov't Consumption/Local GDP})_{i,t} \\ &+ \sum_i \delta_i(\text{Province Dummy})_i + \sum_t \lambda_t(\text{Yearly Dummy})_t + e_{i,t}^{SL}\end{aligned} \tag{2}$$

$$\begin{aligned}(\text{Loan Rate for Non SOEs})_{i,t} =& \beta_0 + \beta_Y(\text{Local Business Condition})_{i,t} \\ &+ \beta_F(\text{Gov't Consumption/Local GDP})_{i,t} \\ &+ \sum_i \delta_i(\text{Province Dummy})_i + \sum_t \lambda_t(\text{Yearly Dummy})_t + e_{i,t}^{NSL}\end{aligned} \tag{3}$$

$$\begin{aligned}(\text{Deposit Rate})_{i,t} =& \gamma_0 + \gamma_Y(\text{Local Business Condition})_{i,t} \\ &+ \gamma_F(\text{Gov't Consumption/Local GDP})_{i,t} \\ &+ \sum_i \delta_i(\text{Province Dummy})_i + \sum_t \lambda_t(\text{Yearly Dummy})_t + e_{i,t}^{D}\end{aligned} \tag{4}$$

the right-hand-side variables are local business conditions, local government consumption (as a share of the local GDP), province-specific effects, and year-specific effects. By applying the Hodrick and Prescott (HP) filter to the provincial GDP series (Hodrick and Prescott, 1997), local business conditions are calculated by subtracting the HP (100) filtered log (national GDP) from the HP (100) filtered log (province GDP). Note that national shocks that can affect local deposits and local loans are absorbed into the yearly dummy.

The residuals $\hat{e}_{i,t}^{SL}$, $\hat{e}_{i,t}^{D}$ from eqs. (2) and (4), and $\hat{e}_{i,t}^{NSL}$, $\hat{e}_{i,t}^{D}$ from eqs. (3) and (4) are then used to compute the new correlations between local deposit rates and local loan rates for the state and the non-state sectors, respectively.

When the national trend and province-specific determinants that can affect local deposits and loans are controlled, the correlation between the deposit rates and the loan rates for the non-state sector drops

slightly from 0.91 to 0.82 (row 2), but remains much higher than the corresponding figures between the total deposit and total loan rates across Chinese provinces and OECD member countries calculated by BW (2004) (quoted in rows 8 and 10). On the other hand, the correlation for the state sector is negative but statistically insignificant (-0.02, row 5).

To address possible endogeneity in right-hand-side variables, I estimate eqs. (2), (3), and (4) using the two-stage least squares method, with the lagged right-hand-side variables and province-specific effects as instruments. Nonetheless, it produces practically no changes in the results (rows 3 and 6).

The results suggest that there exist strong barriers to cross-regional funds allocation within the banking sector in the non-state sector in China. What causes them? The Chinese government has conducted a series of policy reforms in the banking system since the 1980s. For instance, a national unified inter-bank market was created and inter-bank interest rates were liberalized in 1996, and both state-owned and non-state-owned commercial banks were permitted asset and liability management based on their profit incentives by the end of 1998 (e.g. Park and Sehrt, 2001, Wu, 2004). These policy changes should have facilitated domestic funds allocation within the banking sector. Therefore, serious asymmetric information problems that exist between banks and non-SOEs rather than the institutional peculiarities of the

Chinese banking system seem to lead bank lending to local non–SOEs to depend highly upon the local deposits within China.

IV. Concluding Remarks

This article examines the dependency of local bank lending on local deposits within China in the Feldstein—Horioka vein. In the case of a transition economy like China, it would be appropriate to assume the presence of a significant level of disparity in the cost of funds between SOEs and non-SOEs. For this purpose, a dataset of the provincial deposit rates and the provincial loan rates for the state and the non-state sector is built. Even after controlling the national- and province-specific shocks, the correlation between the local deposit rates and the local loan rates for the non-state sector, in contrast to that for the state sector, is even higher than for OECD member countries. In spite of a series of policy reforms in the banking system conducted by the Chinese government since the 1980s, these findings suggest that serious asymmetric information problems between banks and non-SOEs might impede cross-regional lending to them and prevent the development of the non-state sector within China.

Acknowledgements

I would like to thank Masaharu Hanazaki and Teruo Mori for their useful comments and suggestions. Any remaining errors are my own.

This research was supported by Waseda University Grant for Special Research Projects (2008A-833).

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[1] See, for instance, Allen et al. (2008).

[2] Payne and Mohammadi (2006) examine the association between saving and investment among transition economies.

[3] Following the literatures, the coastal region in this study includes Beijing, Tianjin, Hebei, Liaoning, Shangdong, Shanghai, Jiangsu, Zhejiang, Fujian, Guangdong, Hainan, and Guangxi.

[4] Iwamoto and van Wincoop (2000) themselves implement this methodology to examine financial integration across Japanese prefectures.

Table 1 Estimation of $\hat{\beta}$ with AR(1)/fixed effect

Regression of total loans/provincial GDP on:

	[1]		[2]	
	coefficient	p value	coefficient	p value
SOE output/total output	0.478	0.008	0.459	0.025
	(0.179)		(0.203)	
(SOE output/total output) $*$ (Coastal dummy)			0.068	0.913
			(0.620)	
AR(1)	0.448	0.000	0.450	0.000
	(0.118)		(0.110)	
Province dummy	Yes		Yes	
$\bar{R}^2$	0.921		0.920	
obs.	186		186	

Notes: The dependent variable is the total loan as a share of the provincial GDP during 1999–2005; SOE output/total output is the output share of state-owned enterprises; Coastal dummy is a dummy variable that equals one if the province is located in the coastal region (Beijing, Tianjin, Hebei, Liaoning, Shangdong, Shanghai, Jiangsu, Zhejiang, Fujian, Guangdong, Hainan and Guangxi) and zero otherwise. Regressions are estimated with AR(1) and fixed effects. Robust standard errors,which have been corrected for cross-section heteroskedasticity, appear in round brackets.

Table 2 Correlation between local loan rates and local deposit rates

	Sector	Method	Period	Author	Coefficient
China	Non State	U	1999–2005	This Article	0.909^{***}
China	Non State	C (FE)	1999–2005	This Article	0.818^{***}
China	Non State	C (2SLS/FE)	1999–2005	This Article	0.839^{***}
China	State	U	1999–2005	This Article	0.040
China	State	C (FE)	1999–2005	This Article	-0.024
China	State	C (2SLS/FE)	1999–2005	This Article	-0.011
China	All	U	1990–2001	BW (2004)	0.505^{**}
China	All	C (FE)	1990–2001	BW (2004)	0.580^{**}
OECD	All	U	1990–2001	BW (2004)	0.617^{**}
OECD	All	C (FE)	1990–2001	BW (2004)	0.285^{**}

Notes: The two-stage least squares method are used with the lagged right-hand-side variables and province-specific effects as instruments. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% levels, respectively.

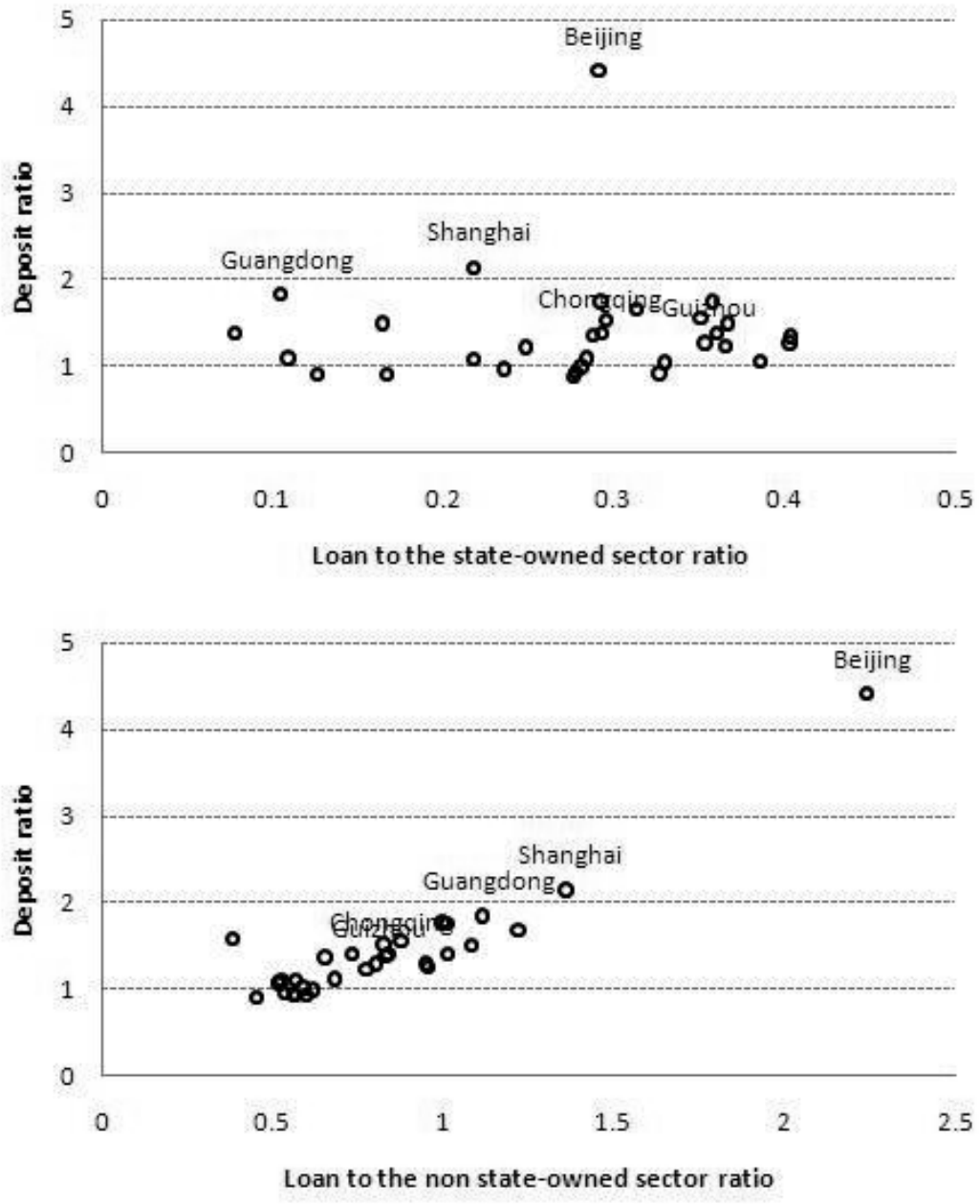

Figure 1 Averaged local deposit and loan rates over 1999–2005

Notes: Average values of deposits and loans for the state sector (above) and those for the non-state sector (below) as a share of the provincial GDP.