

# **Regulatory Reform and Convergence in Banking: The Case of China**

James C. Brau<sup>a</sup>, Drew Dahl<sup>b†</sup>, Hongjing Zhang<sup>c</sup>, Mingming Zhou<sup>d</sup>

<sup>a</sup>Marriott School, Brigham Young University, Provo, UT 84602 USA;

<sup>b</sup>Jon M. Huntsman School of Business, Utah State University, Logan, UT 84322 USA;

<sup>c</sup>Northeast Dianli University, Jilin City, 13012 P.R. China;

<sup>d</sup>College of Business and Administration, University of Colorado at Colorado Springs, CO 80918 USA

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## Introduction

China's economic expansion has been accompanied by dramatic regulatory reforms the Chinese banking industry in its evolution from a socialist system more than fifty years ago. Recent studies on the effect of reforms on Chinese banking undertake tests to determine how and why various types of banks may have responded in terms of changes in banking efficiency, costs, and profits.

Alternatively, we examine the possible effects of reform on the internal organization structure of Chinese banks. Specifically, have levels of lending and capitalization **converged** across various categories of Chinese banks? Have their structures become more uniform as a result of reforms intended to encourage restructuring at inefficient banks?

## Categories of Chinese Banks

Big Four Banks -- Operate nationally and provide retail and wholesale banking services. They control more than 70 percent of the loan market in China. State ownership is predominant.

Majority State Banks -- Are majority owned by state and local governments and by state-owned enterprises. Were established to facilitate the development of an efficient banking system and are less likely to be involved with the implementation of state policy than the Big Four banks.

Majority Private Banks -- Are majority owned by domestic private institutions and/or individuals. Tend to be smaller and are owned by local government, local enterprises and households. The state holds minority shares in majority private banks. They offer services to smaller enterprises and individuals and, increasingly, larger customers.

Majority Foreign Banks -- Driven by the need for capital and the urgency for importing advanced management and technology, foreign investors have been encouraged to acquire equity stakes in domestic banks.

## The Sample

We use annual financial information for Chinese banks, 2001 to 2007. This period follows China's entry into the World Trade Organization (WTO) in 2001.

For all banks, we calculate the ratios of total net loans to total assets and total equity capital to total assets.

The ratio of loans to assets, as evidence of asset allocation, is important because of the traditional differences in lending activities across different types of Chinese banks—differences that financial reform, at least in part, were intended to diminish.

The ratio of equity to assets is important because of the prominence of bank capital structure in financial reforms following entry into the WTO.

## The Convergence Model

$X_{it}$  represents a financial ratio for bank  $i$  in period  $t$ . Suppose that changes at each bank follow a partial adjustment framework and that banks in all four categories have a common target ratio,  $X_n^*$ . We model the adjustment process for bank  $i$  in type  $n$  with type-specific rate-of-adjustment parameter  $\rho_n$ :

$$X_{it} - X_{i,t-1} = \sum_{n=1}^4 \rho_n (X_n^* \cdot TYPE_{in}) - \sum_{n=1}^4 \rho_n (X_{i,t-1} \cdot TYPE_{in}) + \varepsilon_{it} .$$

where  $TYPE_{in}$  is a binary variable equal to unity if bank  $i$  is in type  $n$  and zero otherwise.  $\rho_n$  is expected to be positive. The first term on the right-hand side in the model is unique for all banks within a given type, since  $\rho_n$  and  $X_n^*$  are type-specific.

We define *convergence* for category  $X$  as a common target ratio and rate of adjustment. This motivates two hypotheses:

Common target hypothesis:  $X_1^* = X_2^* = X_3^* = X_4^*$

Common adjustment rate hypothesis:  $\rho_1 = \rho_2 = \rho_3 = \rho_4$ .

## The Convergence Model (Continued)

Let  $X^{**}$  be the grand mean ratio for a given activity over all banks, types, and years. We use  $X^{**}$  as a benchmark for comparison and discussion of individual type target ratios. Specifically, we will determine whether each bank type target ratio is equal to the grand mean of the ratio over the sample period. Dividing both sides of (2) by  $X^{**}$  gives:

$$\left[ \frac{X_{it}}{X^{**}} \right] - \left[ \frac{X_{i,t-1}}{X^{**}} \right] = \sum_{n=1}^4 \rho_n \left( \frac{X_n^*}{X^{**}} \cdot TYPE_{in} \right) - \sum_{n=1}^4 \rho_n \left( \frac{X_{i,t-1}}{X^{**}} X_{i,t-1} \cdot TYPE_{in} \right) + \varepsilon_{it}.$$

Writing (3) in difference form, with  $\widehat{X}_{it} = X_{it}/X^{**}$  and  $\widehat{X}_n^* = X_n^*/X^{**}$ , yields:

$$\begin{aligned} \Delta \widehat{X}_{i,t} &= \sum_{n=1}^4 \rho_n (\widehat{X}_n^* \cdot TYPE_{in}) - \sum_{n=1}^4 \rho_n (\widehat{X}_{i,t-1} \cdot TYPE_{in}) + \varepsilon_{it} \\ &= \sum_{n=1}^4 \alpha_n TYPE_{in} - \sum_{n=1}^4 \rho_n (\widehat{X}_{i,t-1} \cdot TYPE_{in}) + \varepsilon_{it} \end{aligned}$$

As a result of normalizing by  $X^{**}$ , the intercept term for a given bank type,  $\alpha_n = \rho_n \widehat{X}_n^*$ , will be greater than (less than) the magnitude of the slope coefficient for that type,  $\rho_n$ , only if  $\widehat{X}_n^*$  is greater than (less than) unity, that is to say, only if the target ratio for type n exceeds the grand mean of the ratio. We estimate  $\widehat{X}_n^*$  as the quotient of the intercept and slope coefficients—i.e., the ratio of the estimate of the bank-type intercept to the negative of the bank-type slope coefficient.

Table 1 – Mean Bank Ratios, by Bank Type

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	Loans/Assets	Equity/Assets	Observations
Big Four	0.535	0.029	24
Majority state	0.554	0.044	92
Majority private	0.526	0.061	212
Majority foreign	0.575	0.304	36

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Notes: Ratios are for 364 observations on banks, 2002 to 2007. Big Four banks include Bank of China, China Construction Bank, Industrial and Commercial Bank of China, and Agricultural Bank of China. The majority state banks are defined as those that are majority owned by the state, where state refers to the central and local government as well as state-owned enterprises. The majority private banks include those that are majority owned by domestic private institutions and individuals. Majority foreign banks refer to those majority owned by foreign investors.

Table 4 – Seemingly Unrelated Regressions

Panel A: Loans / Assets

	Intercept $\alpha$	slope $-\rho$	$\frac{\alpha_n}{\rho_n}$	F-statistic $\frac{\alpha_n}{\rho_n}$
Big Four	.147 (0.93)	-.172 (-1.12)	0.85	1.67
Majority state	.650* (5.09)	-.598* (-5.09)	1.08*	10.80
Majority private	.224* (5.57)	-.235* (-5.78)	0.95	2.01
Majority foreign	.213* (2.82)	-.166* (-2.46)	1.28*	3.97

F-Value for common adjustment rate hypothesis ( $\rho_1=\rho_2=\rho_3=\rho_4$ ): 3.56, PR> F, .01

Panel B: Equity/Assets

	Intercept $\alpha$	slope $-\rho$	$\frac{\alpha_n}{\rho_n}$	F-statistic $\frac{\alpha_n}{\rho_n}$
Big Four	.098 (1.15)	-.379* (-3.27)	0.26*	8.57
Majority state	.251* (3.93)	-.592* (5.88)	0.42*	22.01
Majority private	.307* (7.38)	-.464* (-9.06)	.65*	20.25
Majority foreign	.420* (2.49)	-.133* (-3.81)	4.21*	4.02

F-Value for common adjustment rate hypothesis ( $\rho_1=\rho_2=\rho_3=\rho_4$ ): 13.56, PR> F, .01

Notes: The sample consists of 364 observations on banks, 2002-2007. The model includes an equation (not shown) to control for bank profitability. The definitions of the various bank categories are the same as in Table 1. t-statistics are in parenthesis. A negative slope coefficient, coupled with a ratio ( $\alpha / \rho$ ) in excess of unity, is consistent with a conclusion that the target ratio for a bank type is above the overall mean for the four types in the sample. The system weighted R-square is 29%. Asterisks indicate statistical significance at the 5% level.



Table 5 – Seemingly Unrelated Regressions

Panel A: Loans / Assets

	Intercept $\alpha$	slope $-\rho$	$\frac{\alpha_n}{\rho_n}$	F-statistic $\frac{\alpha_n}{\rho_n}$
Big Four	.167 (1.08)	-.188 (-1.26)	0.88	1.32
Majority state	.556* (4.24)	-.505* (-4.22)	1.10*	9.66
Majority private	.229* (4.24)	-.237* (-5.97)	0.96	1.12

F-Value for common adjustment rate hypothesis ( $\rho_1=\rho_2=\rho_3$ ) 2.37, PR> F, .09

Panel B: Equity/Assets

	Intercept $\alpha$	slope $-\rho$	$\frac{\alpha_n}{\rho_n}$	F-statistic $\frac{\alpha_n}{\rho_n}$
Big Four	.136 (1.48)	-.352* (-3.98)	0.38*	6.91
Majority state	.349* (5.03)	-.545* (-7.15)	0.64*	11.59
Majority private	.447* (9.94)	-.448* (-11.49)	.99	1.39

F-Value for common adjustment rate hypothesis ( $\rho_1=\rho_2=\rho_3$ ): 1.39, PR> F, .25

Notes: The sample consists of 328 observations on banks, 2002-2007. The sample excludes majority foreign banks. The model includes an equation (not shown) to control for bank profitability. The definitions of the various bank categories are the same as in Table 1. t-statistics are in parenthesis. A negative slope coefficient, coupled with a ratio ( $\alpha / \rho$ ) in excess of unity, is consistent with a conclusion that the target ratio for a bank type is above the overall mean for the four types in the sample. The system weighted R-square is 29%. Asterisks indicate statistical significance at the 5% level.

## Conclusions

Our evidence rejects a hypothesis that the four different categories of banks have a common structure. Differences in targeted levels of loans and equity are evident, particularly for majority state banks, which have relatively higher targeted levels for lending and lower targeted levels for capitalization. This indicates that the erosion of barriers to competition in China over implementation of the WTO has not imposed a uniform mix of activities on the four types of Chinese banks.

In terms of how banks adjust to their targets, however, a somewhat different story emerges. Domestic banks are shown to share a more common pattern of behavior. This finding raises the possibility that financial reform is making at least some inroad into changing the structure of domestic banks in China.