

# The Impact of Deregulation Trends on the Chinese Banks' Interest Margins

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## Abstract

In this paper, we examine the impact of deregulation trends and foreign bank entry on the net interest margins of China's banking sector. By comparing the banks' net interest margins before and after the banking liberalization, we investigate the impact of the financial deregulation and the presence of foreign banks on the profitability of Chinese banks. The results indicate that the entrance of foreign banks has strong negative effects on the profitability of domestic banks. The credit risk is the major factor to enhance the profitability of the Chinese domestic banks.

**Keywords:** bank margins, banking liberalization, foreign entry

**JEL:** G21, G32.

## 1. Introduction

The bank, which functions as an intermediary in channeling funds, plays a key role in the economic growth. It is an important measure of not only the bank profitability but also the social cost of financial intermediations. Higher interest margins bring about a higher profitability and a better stability for the banking sector. According to the WTO accession agreement, a full line of banking businesses in both foreign and local currency was then opened to foreign banks and branches, without any restriction on geographical or business scopes. Foreign banks were allowed to receive deposits from the public without a special permission or license. Both foreign and domestic banks were then supervised by the same regulatory standards. Therefore, the period after 2007 is denoted as the post-liberalization period. The presence of foreign banks contributed to the improvement of competition in the banking sector and reduced the interest margins of domestic banks (Claessens et al., 2001; Williams, 2003; Claey's & Vennet, 2008). Xu (2010) investigated the impact of foreign banks entry on the Chinese banking sector, and suggested that the presence of foreign banks generated a higher competition and improved the bank efficiency in China. The main objective of this paper is to investigate the determinants of the net interest margins of the Chinese banks while taking into account the presence of foreign banks.

The remainder of the paper is organized as follows. Section 2 gives a brief review of relevant literature on the determinants of banks' interest margins. The empirical framework is presented in section 3. Section 4 describes the samples and the variables. Section 5 presents the major empirical results. Finally, we conclude the analyses with a summary of the results in section 6.

## 2. Literature Review

Ho and Saunders (1981) propose the pioneering model, in which the bank is regarded as a risk-averse dealer, and the spread relies on the intermediation activities. This dealership model is a reference framework for many subsequent empirical analyses. Allen (1988) extends the Ho-Saunders model by including alternative products in the loan portfolio, which leads to the diversification of financial intermediaries. Carbó-Valverde and Rodríguez-Fernández (2007) consider the loan heterogeneity and involve the non-traditional assets into the multi-output model. They use a data of 19,322 European banks to examine the interest margins between 1994 and 2001. Their findings indicate that the low bank interest margin, which is a result of a stronger competition, could be compensated by the revenue of non-traditional businesses. Similarly, Wong (1997) proposes a firm model in a static setting. He analyzes multiple risk measures and suggested an ambiguous effect of the interest

risk on the interbank market.

Among other empirical works, Demirguc-Kunt and Huizinga (1999) finds higher interest margins of foreign banks than that of domestic banks in developing countries, while the opposite result exists for developed countries. Maudos and Fernandez de Guevara (2004) extend the empirical framework by including operating costs and market power. In addition, the decline of domestic banks' interest margins has been associated with the presence of foreign banks in transition economies. The main contribution of our paper is to use a comprehensive data to study the effect of banking liberalization in China (Note 1). By comparing the banks' net interest margins before and after the banking liberalization, we attempt to scrutinize the impact of financial deregulation and the presence of foreign banks on the profitability of Chinese banking sector.

### 3. Empirical Approach

We investigate the determinants of net interest margins of Chinese banks in the context of Ho and Saunders (1981). There are two empirical approaches in the literature to estimate the determinants of net interest margins. The first is a two-stage process, which is used by Ho and Saunders (1981), Saunders and Schumacher (2000) and Doliente (2005). On the other hand, McShane and Sharpe (1985) and Angbazo (1997) propose an alternative single-stage approach, which includes both bank-specific characteristics and country-specific macroeconomic conditions as explanatory variables (Qi & Zhang 2018) (Note 2). Therefore, the single-step estimation approach is employed in this analysis. In addition, the presence of foreign banks is found to be negatively related to the NIM (Claessen et al., 2001; Drakos, 2003; Claeys & Vennet, 2008). We investigate the impact of foreign banks entry on the interest margins of Chinese domestic banks by involving the number of foreign banks in order to capture the effect of foreign banks' presence. Our empirical framework is specified as follows:

$$NIM_{it} = \beta_0 + \beta_1 HHI_t + \beta_2 Sise_{it} + \beta_3 Opportunity_{it} + \beta_4 Inefficiency_{it} + \beta_5 Risk_{Aversion_{it}} + \beta_6 Liquid\_Risk_{it} + \beta_7 Default\_Risk_{it} + \beta_8 Credit\_Risk_{it} + \beta_9 Foreign_i + \varepsilon_{it}$$

We first estimate the results using a fixed effect method, which controls for all individual characteristics of banks (Note 3). Since the interest margins are explained by quantities, the estimations are challenged by potential endogeneity biases. For example, Garc á-Herrero et al. (2009) indicate that the more profitable banks increase their equity capital and size more easily. To address this problem, Arellano and Bover (1995), Blundell and Bond (1998) introduce the Generalized Method of Moments (GMM), known as the system GMM estimator, to alleviate endogeneity concerns. The lagged dependent and explanatory variables in both levels and differences are employed as instrumental variables. In addition, the system GMM estimator also accounts for the unobserved heterogeneity across banks (Garc á-Herrero et al., 2009; Dietrich & Wanzenrie, 2011). The results of Hansen test of over identification and autocorrelation tests for consistency are reported (Note 4). According to the econometric approach, the following variables are included in the estimation.

- 1) **HHI**: Herfindahl-Hirschmann Index (HHI) is used to capture the market concentration, which is defined as the sum of the squares of the market shares of each bank. (Qi & Zhang, 2018, Maudos & Fernandez, 2004) Cetorelli and Gambera (2002) argue that the bank concentration can also have a depressing impact on growth.
- 2) **Size**: Total loan is used as a proxy of the size of individual banks (Qi & Zhang, 2018). Maudos and Fernandez de Guevara (2004) suggest a positive relationship between the bank interest spread and the average size of operations (Note 5). Therefore a positive sign of size is expected.
- 3) **Opportunity**: The ratio of liquid reserves, which are the sum of cash and due from banks, to total assets, is used to proxy the opportunity costs. The higher liquidity ratio of banks' asset, the higher opportunity costs for banks. Then a greater volume of interest margins is required to cover the cost. Therefore, a positive sign of opportunity is expected (Qi & Zhang, 2018).
- 4) **Liquid\_Risk**: Following Angbazo (1997) and Qi and Zhang (2018), the ratio of liquid assets is used to total liabilities to proxy the liquid risk. A positive sign is expected.
- 5) **Credit\_Risk**: The loan to assets ratio is used to proxy the credit risk. (Maudos & Fernandez, 2004; Kasman et al., 2010; Qi & Zhang, 2018) Since the higher volume of loans granted is associated with higher credit risk exposure, we assume it has a positive impact on the interest margins.
- 6) **Default\_Risk**: The ratio of loan loss provisions to total loans to proxy the default risk. Since the banks require extra interest margins to compensate for higher default risk, a positive sign is expected (Kasman et al., 2010, Qi & Zhang, 2018)
- 7) **Foreign**: we employ the number of foreign banks to proxy the impact of foreign banks on Chinese domestic banking market. Since the financial market openness and increased presence of foreign banks can bring about

higher competition to the domestic banking sector and improved welfare for customers, we argue that foreign banks' presence has a negative impact on the interest margin of banking sector (Claessen et al., 2001; Claeyns & Vennet, 2008)

#### 4. Data and the Description of the Sample

We use a sample of 116 Chinese domestic banks in this paper. The data is obtained from the BankFocus. The total number of foreign banks is from the annual report of China Banking Regulatory Commission. Table 1 illustrates a summary statistics of the variables before and after the banking liberalization

Table 1. The mean value of variables before and after the banking liberalization

	Sample before the banking liberalization		Sample after the banking liberalization	
	Mean	Std. dev	Mean	Std. dev
NIM (%)	2.426	0.847	3.164	0.990
HHI	1935	1364	1093	3.497
Size	8.201	1.922	8.655	1.043
Opportunity (%)	0.7	0.007	4	0.070
Inefficiency (%)	49.4	0.169	37.3	0.102
Risk_Aversion (%)	4.3	0.025	5.9	0.024
Liquidity_Risk (%)	18.8	0.085	24.1	0.089
Default_Risk (%)	0.9	0.006	0.9	0.008
Credit_Risk (%)	54.5	0.096	52.8	0.081
Foreign banks	196	13.511	308	26.260

Table 1 illustrates that the net interest margins after 2007 was higher than before. It means that the domestic banks did not suffer from the financial market openness in 2007. Instead, the presence of foreign banks forced domestic banks to improve their efficiency and performance. In addition, the opportunity costs of bank reserves had increased substantially after 2007 - from 0.7% to 4%. The average interest margin of Chinese banks during the period of 2000 - 2009 was 2.7%. It is similar to European banks, in spite of a lower volatility. The loan size of the full sample is lower than that of European banks. Furthermore, we find a similar Credit Risk level, a lower Liquid Risk and a lower default risk of Chinese banking sector than that of European banks (Kasman et al., 2010; Carbó-Valverde & Rodríguez-Fernández, 2007).

#### 5. Empirical Results

We estimate the determinants of Net Interest Margins using both Fixed Effect and GMM methods, as shown in Table 2. Column (1) reports the estimation under fixed effect model for all banks between 2000 and 2009. Column (2) reflects the results of the sub-period before 2007 under the fixed effect method. The results after the banking liberalization in 2007 with fixed effect model are presented in Column (3). Column (4) – (6) report the results for the whole sample, sub-period before and after the liberalization with system GMM method respectively. In general, we find overall that the explanatory variables achieve the predicted signs. The fixed effect estimations of the coefficients of loan size and inefficiency are negative, which are not consistent with the GMM estimators. Since the fixed effect estimation tends to be biased due to the endogeneity problem, the GMM estimator seems to be more reliable (Note 6). We do not notice a significant effect of neither loans nor inefficiency on the interest margins in GMM estimation, except for the period before 2007. Table 2 illustrates that the number of foreign banks to proxy the influence of foreign bank presence. The presence of foreign banks has a significant and negative impact on the domestic banking sector. This result is consistent with the findings of Claessens et al. (2001) and Claeyns and Vennet (2008). The entry of foreign banks reduced the banks' profitability particularly after the banking liberalization. This implies that the presence of foreign banks forced the domestic bank market to be more competitive and therefore to reduce the bank's net interest margins. Another result that deserves our attention is that only the credit risk variable seemed to contribute to the increase of interest margins after 2007. This may be explained by the risk-taking behavior of the Chinese banks. In particular, after the banking liberalization, the domestic banks became more profit-driven and risk averse. They tend to keep lower liquidity assets and loan loss provisions than before. On the other hand, the positive effect of credit risk indicates that the loan expansion is also the most important way to earn interest margins in the Chinese banking market.

Table 2. Regression results with the presence of foreign banks

	Fixed Effect			System GMM		
	(1)	(2)	(3)	(4)	(5)	(6)
HHI	-9.11E-5 (-1.04)	-5.51E-5 (-0.69)	-1.45E-2*** (-3.96)	-5.00E-3*** (-2.82)	-4.26E-3 (-3.44)	-1.49E-2 (-2.30)
Size	-0.429*** (-4.01)	-0.626*** (-4.04)	0.320 (1.40)	0.050 (0.71)	0.159* (1.82)	-0.021 (-0.27)
Opportunity	4.158*** (6.84)	0.344 (0.07)	4.797*** (5.85)	4.839 (1.52)	82.13 (1.19)	6.627* (1.72)
Inefficiency	-3.238*** (-9.02)	-3.277*** (-6.53)	-2.377** (-2.36)	2.321 (1.21)	1.516 (0.74)	0.654 (0.19)
Risk_aversion	3.555*** (3.01)	2.445 (1.57)	3.656* (1.91)	25.49* (1.83)	19.00 (1.25)	20.34 (1.17)
Liquid_risk	0.843 (1.61)	-0.515 (-0.66)	0.012 (0.01)	8.370*** (3.09)	5.720*** (2.00)	4.535 (1.30)
Default_risk	17.15*** (3.80)	18.82*** (2.85)	9.665 (1.28)	74.96*** (3.02)	94.54*** (2.70)	39.00 (1.43)
Credit_risk	2.655*** (4.97)	1.780** (2.37)	3.140*** (2.94)	6.300*** (3.91)	3.603* (1.70)	7.418*** (3.45)
Foreign	0.0040*** (3.94)	0.0107*** (3.49)	-0.0150*** (-4.80)	-0.0096*** (-2.68)	-0.0103 (-1.50)	-0.0161** (-2.51)
Constant	4.910*** (5.80)	5.960*** (5.13)	19.76*** (4.38)	2.744 (0.84)	2.750 (0.88)	17.86** (2.15)
AR(1)	N/A	N/A	N/A	0.011	0.031	0.006
AR(2)	N/A	N/A	N/A	0.181	0.135	0.146
Hansen	N/A	N/A	N/A	0.051	0.241	0.025

Note. Variables are instrumented through GMM procedure following Arellano and Bover (1995), Blundell and Bond (1998). AR(1), AR(2) refer to the p-value of first- and second-order Arellano-Bond test for autocorrelation. Hansen is the p-value of Hansen test for over-identification. t statistics in parentheses \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

## 6. Conclusions

In this paper, we examine the impact of deregulation trends and foreign bank entry on the net interest margins of China's banking sector. The banking liberalization brings about higher competition and narrowed net interest margins. The risk-taking behavior of the Chinese banks is also influenced by the entry of foreign banks. The foreign bank entry forced domestic banks to be more competitive and to reduce the bank's net interest margins. After the banking liberalization, domestic banks did not keep as many liquid assets and loan loss provisions as before. We find a substantial and negative impact of foreign bank presence on the profitability of domestic banks.

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## Notes

Note 1. Differing from Zhou and Wong (2008), we involve not only the commercial banks but also cooperative credit into our sample for the investigation.

Note 2. The single-stage approach is also used by Maudos and Fernandez de Guevara (2004), Claeys and Vennet (2008), Kasman et al. (2010)

Note 3. Maudos and Fernandez de Guevara (2004) have used fixed effects method to investigate the case of European banking sector.

Note 4. Both first- and second-order autocorrelation tests are reported. If the second-order autocorrelation is observed, the system GMM estimator is then inconsistent.

Note 5. However in the empirical results, the negative impacts of loan size on the NIM for France and Italy are reported.

Note 6. As Garc ía-Herrero et al. (2009) said, more banks with higher interest margins have more advantage to increase the size, which contributes to the bank's profitability.

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