

Does the Chinese banking system benefit from foreign investors?

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Abstract

We find empirical evidence that the Chinese banking system has benefited from the entry of foreign investors through higher profitability and increased efficiency of the banking system. Foreign participation, which consists of a minority stake in a Chinese bank (in contrast to the typical pattern in emerging countries), appears to be most effective when the foreign bank acts as a strategic investor. Purely financial investors contribute little, if anything, to bank performance.

Key words: China, banking system, foreign participation

JEL classification: G21, G28

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1. Introduction

This paper aims at assessing how the Chinese banking system has benefited from non-control foreign investment. Due to the different nature and degree of involvement of foreign investors, this work also examines the effect of different kinds of foreign investors on the performance of the domestic institutions.

The opening-up of the banking sector to foreign participation was a key decision within a broader reform strategy. In fact, China's banking sector and its financial system in general, remains the Achilles' heel of an otherwise economic titan. While the banking sector is the most important component of the financial system (with 66% of total financial assets in 2006), it still remains relatively undercapitalized, unprofitable, and saddled with non-performing loans (NPLs) mainly as a result of the entrenched relations between state-owned enterprises and banks while the country was moving from a planned to a market economy.

After several unsuccessful attempts in the 1990s, the Chinese authorities' approach to banking system reform changed in 2003.² Their new strategy was built on three pillars. First, banks were recapitalized and NPLs taken off the balance sheets of troubled banks. Second, financial liberalization started through gradual deregulation of government driven allocation of credit and interest rates controls, opening-up to foreign competition and cautious steps towards capital account liberalization. Third, financial regulation and supervision was strengthened, coupled with efforts to improve financial institutions corporate governance and transparency. While the reform process has improved Chinese banks' performance in recent years, government intervention remains pervasive.

Encompassed in this reform, Chinese authorities have opened up their banking system to foreign competition while tightly regulating it (see Appendix A). In their mind, allowing foreign acquisitions of Chinese banks should enhance local banks performance, particularly through better management, risk assessment and corporate governance. At the same, however, to avoid losing public control over local institutions, foreign investors have so far been limited to acquiring only non-control stakes. The limits per bank are currently 20% for a single foreign investor stake and 25% for a collective one. Greenfield investment in branches and subsidiaries is also allowed, although very tight regulation has made organic growth difficult and slow. In this environment, foreign banks' options are either to accept a minority stake or slowly set up their own branches and subsidiaries.

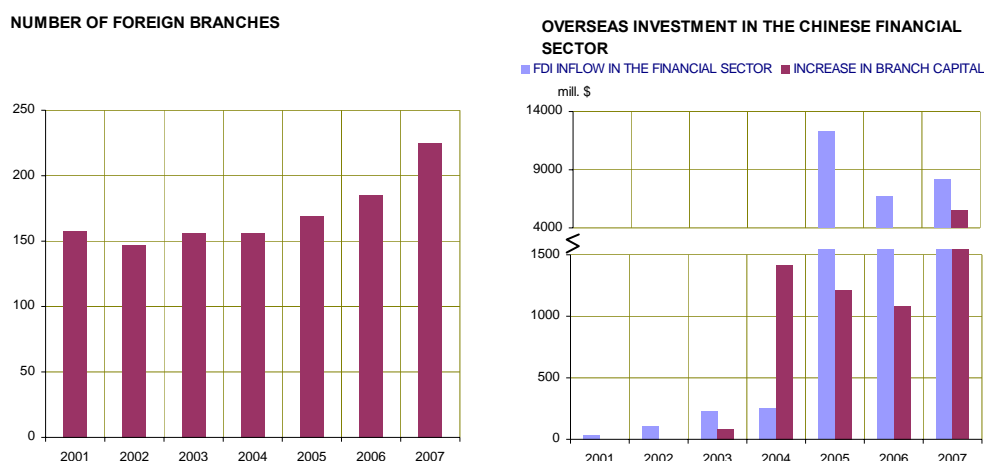
Notwithstanding the restrictions on control, foreign direct investment (FDI) inflows into the Chinese financial sector have been substantial: more than USD 25 billion during 2003–2007 (Figure 1). As of July 2007, 28 Chinese banks had received foreign investment. Table 1 shows the published agreements between foreign investors and Chinese banks.³

² For further details on the reform of the Chinese banking sector, see García-Herrero et al. (2006a).

³ An exploration of the agreement terms reveals several interesting features:

- The authorities initially granted foreign investors the right to acquire stakes in mid-size banks that already had private shareholders. Upon evaluating this experience, they authorized foreign minority stakes in three of China's four large state-owned commercial banks.
- The nature of foreign investors has changed over time. The first wave was composed of international organizations with small stakes aimed at helping the restructuring of Chinese partners, while the second wave

Figure 1. Foreign Banks in China



Sources: People's Bank of China and China Banking Regulatory Commission

Obviously, China employs a distinctly different model of foreign bank entry from most emerging economies. Countries in Central and Eastern Europe, as well as many Latin American ones, simply opened their banking systems by allowing full foreign control of local banks. The Chinese minority stake approach, in contrast, can be taken as either a silent partner, treating the stake as a purely financial investment or as a strategic investor involved to some degree in the bank's management. The involvement of an active investor is typically governed by an *ad hoc* agreement between the foreign party and the Chinese bank, and receives close scrutiny from the Chinese regulatory authorities, especially from the Chinese Banking Regulatory Commission.

This paper aims at assessing the benefits of the Chinese's strategy of foreign participation in its banking system. Virtually all of the extensive body of literature on the benefits of foreign participation to banking systems in emerging countries relates to control participation by foreign banks. This paper, in contrast, explores empirically if and how the Chinese banking system has benefited from the entry of foreign banks in minority roles. In addition, it examines which kinds of foreign investors (strategic, financial, private and public) and which kinds of agreements have succeeded best in conferring benefits. Finally, through an empirical model on the determinants of the performance of Chinese banks, this paper investigates the channels through which foreign investors may have boosted performance of local banks.

The remaining paper is organized as follows. Section 2 reviews the literature on the effects of foreign participation on the performance of domestic banking systems and section 3 presents the data. The methodology is set forth in section 4, while section 5 discusses stylized facts. Section 6 gives the main results. Finally, section 7 concludes with suggestions for further study.

was made up of major banks and institutional investors from Western countries and sovereign wealth funds from East Asia and the Middle East.

- Foreign strategic partners seem to be willing to obtain control participations. A relevant part of them have acquired the maximum stake allowed or options to increase it in the event that regulations change to allow it.
- A relevant part of the agreements have included development of joint businesses, such as credit cards, consumer finance, investment banking or wealth management.

Table 1. Agreements between foreign and local institutions

Chinese bank	Foreign acquirer	Date ¹	Stake (%)	Price (mn USD)	Strategic investment	Agreement terms of interest
China Everbright Bank	Asian Development Bank (ADB)	Oct-96	3.0	20		
	International Finance Corporation (IFC)	Jun-05	4.9	19		
Nanjing Commercial Bank	IFC	Nov-01	15.0	27		
	BNP Paribas	Jun-05	19.2	87	Yes	IFC strengthens bank's capital base and assists to improve operating and governance standards. BNP advises in retail banking, fixed income securities, consumer finance, wealth management, risk assessment, IT and internal control and organization
Bank of Shanghai	Hong Kong Shanghai Banking Co. (HSBC)	Dec-01	8.0	63	Yes	
	Shanghai Commercial Bank (HK)	Dec-01	3.0	23		
	IFC	Dec-01	7.0	47		
Shanghai Pudong Development Bank	Citigroup	Aug-02	4.6	73		Citibank provides technical assistance and takes a seat on the board. They set up a joint venture to develop a co-branded credit cards. Citibank keeps an option of increasing its stake.
Xi'an Commercial Bank	IFC	Sep-02	12.4	20		First acquisition in the north-east part of China
	Bank of Nova Scotia	Jun-05	12.5	20	Yes	
Nanchong Commercial Bank	DEG, a subsidiary of KFW	Jan-03	10.0	4	Yes	
	Sparkassen International Development Trust		3.3	2		
Qingdao International Bank	Hana Bank	Oct-03	72.3	25		Foreign bank status
Dalian City Commercial Bank	SHK Financial	Nov-03	10.0	19		
	Bank of Nova Scotia and IFC	Mar-07	24.9	24	Yes	
Fujian Industrial Bank Co. Ltd	Hang Seng Bank	Dec-03	16.0	208	Yes	Jointly developing credit card and personal loan business
	IFC	Dec-03	4.0	52		
	Government of Singapore Investment Co.	Dec-03	5.0	65		
Ping An Bank	HSBC	Mar-04	10.8	NA	Yes	HSBC and Ping An bought Fujian Asian Bank to found Ping An Bank. It was converted into a City Commercial Bank in 2007
	HSBC	May-05	9.1	NA	Yes	
Minsheng Bank	IFC	Jul-04	1.1	23		
	Temasek	Nov-04	4.6	100		
	Hang Seng Bank	Jun-05	8.0	NA	Yes	
Bank of Communications	HSBC	Aug-04	19.9	1747	Yes	HSBC provides assistance on IT and other services. They cooperate on credit card business
	GSIC		5.0	65		
Shenzhen Development Bank	Newbridge Capital LLC	Sep-04	18.0	150		
	GE Consumer Finance	Sep-05	7.0	100	Yes	GE provides expertise in retail consumer finance (including management skills, risk assessment, product development and IT systems)
Jinan City Commercial Bank	Commonwealth Bank of Australia	Nov-04	11.0	17	Yes	One seat on board of directors
Bank of Beijing	ING	Mar-05	19.9	215	Yes	ING advises on retail banking, corporate governance, risk management and human resources. Two board seats out of 15
	IFC	Mar-05	5.0	54		
GuangDong Development Bank	Citigroup	Jun-05	19.9	NA	Yes	Citigroup advises in credit card business. Two seats on board of directors, including a vice president
	IBM		4.7	165		
China Construction Bank (CCB)	Bank of America (BoA)	Jun-05	9.0	2500	Yes	BoA obtains a seat on the CCB board of directors. Strategic assistance in areas of corporate governance, risk management, IT, financial management, human resource management, retail banking (including credit cards) and global treasury services. BoA will provide approximately 50 people to advise CCB
	Tamasek	Jul-05	5.1	1460		Tamasek assists CCB to improve corporate governance. Right to nominate candidates for board of directors

Table 1 (cont'd). Agreements between foreign and local institutions

Chinese bank	Foreign acquirer	Date ¹	Stake (%)	Price (mn USD)	Strategic investment	Agreement terms of interest
Bank of China (BOC)	Royal Bank of Scotland and coinvestors (Merrill Lynch and others)	Aug-05	10.0	3100	Yes	The consortium assists BOC in credit cards, wealth management, corporate banking and personal life insurance. One seat on the board of directors
	UBS	Sep-05	1.6	500		UBS assists in investment banking
	ADB	Oct-05	0.2	75		ADB aim is to streamline corporate governance. It also provides technical assistance for internal control and anti-money laundering
	Temasek	Dec-05	5.0	1500		A 10% stake was proposed, but only a 5% was approved. Tamasek assists BoC in improving corporate governance. Right to nominate candidates for board of directors.
			Nov-07	-0.5		
Bohai Bank	Standard Chartered	Sep-05	19.9	123	Yes	Satandard Chartered advices in product development, risk management and governance. Right to nominate vice chairman and deputy CEO
Huaxia Bank	Deutsche Bank	Oct-05	9.9	233	Yes	Launching co-branded credit cards. Cooperation in high-end customer business, distribution of investment products and cash management services. Provide technical support for risk management, retail and corporate banking and governance. Initially, one seat on board of directors
Hangzhou City Commercial Bank	Sal Oppenheim	Oct-05	4.1	96		
	Commonwealth Bank of Australia	Apr-05	19.9	77	Yes	Advice in credit management, marketing, IT technology, financial management and risk management. One seat on board of directors
ICBC	ADB	Nov-06	5.0	30		ADB helps to promote corporate governance and internal control procedures
	Goldman Sachs, Allianz and America Express	Mar-06	8.5	3800	Yes	Goldman Sachs assists ICBC to enhance corporate governance, risk management and internal controls. The former also provides expertise in treasury, asset management, corporate and investment banking, non-performing loans disposal and product innovation.
						Allianz Group cooperates with ICBC to provide insurance products and services to ICBC's clients. American Express and ICBC develops their existing strategic cooperation in the credit card business. One board seat.
Ningbo Commercial Bank	Kuwait Investment Authority	Apr-06	1.0	719		This sovereign wealth fund is in talks to expand its stake to 10%
	OCBC	May-06	12.2	70	Yes	
Tianjin City Commercial Bank	ANZ Banking Group	Jul-06	19.9	112	Yes	ANZ advices on risk management, retail banking and trade finance. Two seats on board of directors
Hangzhou United Rural Cooperative Bank	Rabobank	Jul-06	10.0	31	Yes	First overseas investor in a Chinese rural cooperative bank. Rabobank provides management expertise and technical assistance in business development, distribution policy, product marketing, credit control, risk management and IT. Rabobank will send a senior staff member
	IFC	Aug-06	4.9	NA		Rabobank and IFC advise Chinese authorities on rural cooperative reforms in Zhejiang province
Nan Tung Bank	Morgan Stanley	Sep-06	100			Full acquisition. Foreign bank status
Shanghai Rural Commercial Bank	ANZ Banking Group Ltd	Sep-06	19.9	252	Yes	Two seats on board of directors
CITIC Bank	BBVA	Nov-06	5.0	648	Yes	BBVA advices on retail banking, wholesale banking, international markets, treasury, risk management and human resources
						BBVA has an option to increase its stake to 15 percent until 2010
Chongqing Commercial Bank	Dah Sing Bank	Apr-07	17	89	Yes	
Qindao City Commercial Bank	Intesa Sanpaolo	Jul-07	19.9	135	Yes	
	Rothschild	Jul-07	5	33		

Source: Own elaboration based on companies reports and news

1) Agreement or publication date

2. Literature review

There is a growing consensus in the literature that the benefits of foreign entry, in terms of better resource allocation and higher efficiency in domestic financial markets, outweigh the losses (see Levine, 1996; Walter and Gray, 1983; Gelb and Sagari, 1990). In a revision of the theoretical literature, Levine (1996) concludes foreign banks improve the quality and availability of financial services in the domestic financial market by increasing bank competition and enabling the application of modern banking skills and technology. They also promote development of the underlying bank supervisory and legal framework, and enhance the country's access to international capital.

On the empirical side, several studies analysed the effects of foreign entry – through control stakes or greenfield investment – on the profitability and efficiency of local banking system. Terrell (1986) analyzes the banking sector of 14 developed countries (including eight that allow entry of foreign banks) using aggregate data. While banking systems that allow foreign bank entry on average have smaller pre-tax profits and gross interest margins, he also finds they enjoy lower operating costs. This would point towards foreign entry fostering competition and efficiency. In the same vein, Claessens et al. (2000), using a panel of bank-level data for 80 countries, evaluate how control foreign ownership affects profitability, net interest margins and overhead costs of domestic institutions. Their results suggest that an increase in the share of foreign banks lowers the profitability and overhead expenses of domestic banks. More recently, Martinez-Peria and Mody (2004) investigate the impact of foreign bank participation and concentration on bank spreads in a sample of developing Latin American countries during the late 1990s. The authors find greater participation of foreign banks spills over into the banking system, lowering spreads and costs.

On the effects of foreign non-control stakes in the performance of the banking sector, there is still little evidence, especially for emerging economies. Previous research was mainly focused on non-financial corporations in developed nations. For instance, there is evidence suggesting that large minority shareholders, such as institutional investors, improve overseeing of managers and mitigate free-rider problems in non-financial firms (Shleifer and Vishny, 1986; McConnell and Servaes, 1995; Agrawal and Knoeber, 1996). On financial corporations, Berger and Bonaccorsi di Patti (2006) test these effects on bank efficiency using US data and find some positive influence of institutional holdings.

To our knowledge, Berger et al. (2007) were the first to attempt (albeit indirect) measurement of the effects of foreign ownership on Chinese banks. They present empirical evidence that smaller banks with foreign participation are more efficient than other banks. Their study, however, does not differentiate among types of foreign investors or take into account the size of the stake the foreign investor holds in the Chinese bank. Moreover, the paper lacks information about the terms of the agreements between investors and Chinese banks and, even more important, the sample ends in 2003 – the very year authorities began to encourage strategic investment and significant deals were signed. The authors focus on efficiency, overlooking broader dimensions of performance such as profitability.

3. Variables and data

Our panel is composed of annual data for 82 Chinese banks⁴ over the period 1999–2006. These banks represent the main universe of Chinese banks, accounting for over 80% of total assets.⁵ Not all banks could provide information for every year and some banks merged or closed. To keep the information on such dynamics of the Chinese banking system, we opt for an unbalanced panel so as not to lose too many degrees of freedom. Our sample contains a total of 358 observations. The number of banks varies from a minimum of 36 in 1999 to a maximum of 67 in 2004. Note that the sample used is less than the total number of observations available (664); those observations with missing data for any of the variables necessary for the models of performance of Chinese banks were dropped. Tables B-1 and B-2 in the Appendix give some descriptive statistics of our sample.

The data on the characteristics of the agreements were compiled by the authors based on bank reports and media. Other bank-specific data were mainly obtained from the Bankscope database maintained by Fitch/IBCA/Bureau Van Dijk, which includes income statements and balance sheet information on banks all over the world. Macroeconomic variables are drawn from official sources through the CEIC database.

We use unconsolidated statements whenever possible, although in some cases data availability forces us to rely on consolidated statements. Obviously, unconsolidated data are preferable; they bring out relevant differences in profit and loss statements and avoid the loss of information from balance sheets of headquarters and subsidiaries compensating each other. All banks ratios are calculated based on the Chinese accounting standard provided by Bankscope. Also, our emphasis is on local business and not Chinese banks' affiliates abroad, which, in any event, are still quite rare.

Our aim is to understand whether foreign participation has any relevant impact on the performance of Chinese banks. Bank performance is generally not easy to measure but much less so in China's case. In fact, its financial sector is not fully liberalized as a floor on lending rates and a ceiling on deposit rates remain. Such measures obviously guarantee a minimum spread to all banks. In addition, Chinese banks may not necessarily have commercial objectives or be managed according to market principles. There is a rich body of evidence on the interference of China's public authorities in credit allocation.

To our knowledge, there have been two attempts to measure the performance of the Chinese banking sector. Berger et al. (2007) focus on efficiency, while García-Herrero, Gavilá and

⁴ The Chinese domestic banking sector is comprised of four state-owned commercial banks (SOCBs). These long served as the lending arm of state-owned enterprises and in financing local government infrastructure projects. The rest of the banking system, with about 45% of total bank assets, has a diversified structure. Three state-owned development banks ("policy banks") work mainly with financing long-term projects such as infrastructure. Thirteen partially private banks ("joint-stock commercial banks," or JSCBs) are fairly market-oriented. More than 100 city commercial banks (CCBs), created out of restructuring and consolidating urban credit cooperatives, operate at the provincial level (although some have grown much larger).

⁵ We exclude Trust and Investment Corporations (intermediate foreign funds to finance local government companies and infrastructure and construction projects), since their business is not purely banking and their role and number has been fading over time.

Santabárbara (2006b) look into profitability. We think profitability is a better measure of performance in as far as the goal of the ongoing banking reform is to achieve a market-oriented financial institution. While we concentrate on profitability here, we also consider efficiency as a determinant of profitability.

Bank profitability is proxied in many ways in the empirical literature. Here, we choose return on assets (ROA) as the preferred measure of profitability as it includes operational efficiency and loan loss provisioning, which are important aspects of bank performance.⁶ Moreover, return on equity is clearly a poor metric in China's case; bank equity is abnormally low and has suffered important artificial changes due to the State Council's recapitalization programs.

Our variables of interest capture the various dimensions of foreign involvement in Chinese commercial banks, i.e. we identify the channels through which foreign participation may affect performance of domestic banks. In particular, we consider four aspects of the agreement between a Chinese bank and its foreign investor(s):

- the size of foreign participation,
- the type of investment (strategic or financial),
- the ownership structure (public or private), and
- the terms of the agreement.

To assess the size of foreign participation, we use two alternative measures:

- a dummy variable that takes a value of 1 if a foreign institution has a stake in the capital of a domestic institution, and
- the share of capital in the hands of foreigners.

To make a distinction between foreign strategic and financial investment, we follow Chinese regulations for strategic investment, which require a foreign stake bigger than 5%, a long-term commitment and transfer know-how to domestic partners. We build two alternative measures for strategic investment

- a dummy variable for the local banks with this type of investor and, alternatively,
- the share of strategic investors in the capital of domestic bank.

In turn, when a foreign investor has a stake below 5% or no announced long-term commitment, we consider it as financial investment. We also build two variables to capture financial deals:

- a dummy variable associated with those institutions with financial investors but without strategic ones, and
- the share of financial investors in the bank's total capital.

Third, we use three dummy variables to distinguish foreign investors on the basis of their ownership structure: whether international organizations⁷, sovereign wealth funds or private investors.

⁶ See García-Herrero et al. (2006b) for a detailed explanation of the advantages and disadvantages of the most commonly used measures of profitability.

⁷ Mainly, the Asian Development Bank and the World Bank's International Finance Corporation.

Finally, we use dummy variables to capture the special characteristics of the agreements between the foreign investor and the Chinese bank:

- the possibility for the foreign partner to get a seat on the board,
- the inclusion of corporate governance clauses (i.e. provisions to enhance the relations between management and shareholders, risk management, IT, internal controls, etc.), and
- the setting up of joint business (e.g. credit cards and consumer finance).

Descriptive statistics on all foreign participation's variables and their correlations are summarized in Table B-1 and B-3, respectively.

As control variables, we introduce other potential determinants of profitability following García-Herrero et al. (2006b). Those can be classified into bank-specific factors, macroeconomic and institutional issues related to China's bank reform.

Among the bank-specific determinants, efficiency, asset quality and capitalization are particularly relevant, since they can be considered in their own right as measures of bank performance. For bank efficiency, we opt for a relatively sophisticated approach, namely X-efficiency.⁸ The concept of X-efficiency hinges on the comparison of a bank's actual profits with the best-practice profits to produce the same output under similar conditions.⁹ Among the different methodologies to estimate the profit function to measure X-efficiency, we opt for a parametric approach based on a commonly-used translog functional form.¹⁰

⁸ There are clear advantages in using X-inefficiency as opposed to simpler measures of bank efficiency. The highly popular cost-to-income ratio, for example, is quite distorted in China's case as lending and deposit rates are not yet fully liberalized.

⁹ We prefer the profit X-efficiency measure over a cost-based measure, because state-owned banks may appear to perform well in terms of costs as they often reduce expenses in underwriting, monitoring and recovering of loans at the expense of profits.

¹⁰ We estimate the following profit function:

$$\begin{aligned} \ln(P/w_2 z_1) = & \delta_0 + \delta_1 \ln(y_1/z_1) + \delta_2 \ln(y_2/z_1) + \delta_3 \ln(y_3/z_1) + \delta_4 \ln(y_4/z_1) \\ & + 1/2 \delta_{11} \ln(y_1/z_1) \ln(y_1/z_1) + 1/2 \delta_{22} \ln(y_2/z_1) \ln(y_2/z_1) + 1/2 \delta_{33} \ln(y_3/z_1) \ln(y_3/z_1) \\ & + 1/2 \delta_{44} \ln(y_4/z_1) \ln(y_4/z_1) + 1/2 \delta_{12} \ln(y_1/z_1) \ln(y_2/z_1) + 1/2 \delta_{13} \ln(y_1/z_1) \ln(y_3/z_1) \\ & + 1/2 \delta_{14} \ln(y_1/z_1) \ln(y_4/z_1) + 1/2 \delta_{23} \ln(y_2/z_1) \ln(y_3/z_1) + 1/2 \delta_{24} \ln(y_2/z_1) \ln(y_4/z_1) + 1/2 \delta_{34} \ln(y_3/z_1) \ln(y_4/z_1) \\ & + \beta_1 \ln(w_1/w_2) + 1/2 \beta_{11} \ln(w_1/w_2) \ln(w_1/w_2) + \theta_1 \ln(y_1/z_1) \ln(w_1/w_2) \\ & + \theta_2 \ln(y_2/z_1) \ln(w_1/w_2) + \theta_3 \ln(y_3/z_1) \ln(w_1/w_2) + \theta_4 \ln(y_4/z_1) \ln(w_1/w_2) \\ & + \text{year dummies} + \ln u_{it} + \ln v_{it} \end{aligned}$$

where P captures the bank's total profits. The output (y) variables (total loans, total deposits, liquid assets, other earning assets), two input price (w) variables (interest expenses to total deposits, non-interest expenses to fixed assets), and one fixed input (z) variable (total earning assets). The u term is represents a bank's efficiency level and v is a random error. The normalization by bank's total earning assets (z₁) reduces heteroskedasticity, and allows comparison of residual terms among banks. The normalization by the last input price (w₂) ensures price homogeneity. Berger et al. (2007) use the same translog function for the Chinese case.

For asset quality, we take the ratio of NPLs to total loans (*NPL ratio*) as the indicator.¹¹ This, in fact, is the target set out by China's supervisory authorities as part of ongoing reforms. This variable has to be treated with caution given the changes in loan classification system, provisioning policies and ad hoc NPLs transfers from selected banks to asset management corporations.

As a measure of capitalization, data constraints oblige us to use the book value of equity over assets. As a robustness test, we take the capital ratio, although the sample is shortened tremendously making the results difficult to interpret (most of the Chinese institutions began to report the capital ratio only in 2003).

Among other bank-specific factors, corporate governance is hardest to measure. Indeed, the term originates in collegial decision-making processes developed centuries ago in Western democracies and transplants poorly into the Chinese context. Thus, the lack of information on political intervention and state control and influence oblige us to introduce indirect measures that may relate to weak corporate governance. For instance, a dummy reflecting the *type* of bank ownership should capture differences in state intervention. We also include a dummy that captures if the bank is listed in the stock market, since this could be associated with better banking practices. Other measures related to corporate governance can be derived from bank balance sheet ratios such as *loans to assets* or *deposits to assets*. The former might be explained by the government's use of moral suasion to allocate credit to certain sectors. The latter might stem from the government offering implicit guarantees to state-owned banks and banks more heavily subject to government intervention.

Market power is an important bank-specific factor. Again, acknowledging the difficulties of measuring market power and the poor quality of the Chinese data, we apply standard definitions. Since it is not the focus of the paper, however, we proxy market power first with a measure of *market share* (i.e. each bank's total assets over those of the whole banking system), and second as *concentration*. We prefer the Herfindahl-Hirschman index as measure of concentration as it takes into account all banks, not just the big ones. Further, it considers the inequality of market shares. This index is defined as the sum of the squared market shares of each bank's assets for a given year. It is slightly greater than 0 for a perfectly competitive market and equals 10,000 in the case of a monopoly.

Among the macroeconomic variables, we include the *real interest rate on loans*, *real GDP growth* and *inflation*.

Finally, two institutional aspects are included:

- China's degree of financial liberalization, measured by the maximum spread between loans and deposit rates (*maximum spread*); and
- injection of public funds in a specific bank, captured by a dummy variable (*recapitalized*).

¹¹ We avoid the NPL ratio to move only between 0 and 1 by using this alternative measure: $\log \frac{\text{NPL ratio}}{1 - \text{NPL ratio}}$.

4. Methodology

We aim at determining empirically the effects of foreign bank participation in its different forms on the performance of Chinese banks.

To this end, we use a three-stage approach. First, we test whether the Chinese banking system has benefited from foreign participation in terms of improved bank profitability, and analyse which elements of foreign participation have been most beneficial. This is summarized in Equation 1 as

$$\ln ROA_{i,t} = \mu_i^1 + c_1 + \alpha_1 \ln ROA_{i,t-1} + \sum_k \beta_k \text{Foreign}_{i,t}^k + \varepsilon_{i,t}. \quad (1)$$

Second, we identify the main determinants of profitability, as shown in Equation 2

$$\ln ROA_{i,t} = \mu_i^2 + c_2 + \alpha_2 \ln ROA_{i,t-1} + \sum_j \delta_j \text{ROA determinant}_{i,t}^j + u_{i,t}. \quad (2)$$

The third step aims at assessing how various features of foreign participation influence the relevant determinants of profitability and, hence, the channels through which they ultimately affect performance of local banks.¹² The latter can be summarized in Equation 3 as

$$\text{ROA determinant}_{i,t}^j = \mu_i^{3j} + c_3^j + \sum_k \phi_k \text{Foreign}_{i,t}^k + v_{i,t}^j. \quad (3)$$

Each of these steps contains econometric challenges.

To determine the impact of different kinds of foreign investment on profitability, we consider the well-documented phenomenon of persistence of profitability by introducing its lag as additional regressor. In addition, unobservable heterogeneity across banks could be very large in the Chinese case, particularly given the difficulty in evaluating corporate governance.¹³ To deal with this, we employ the Generalized Method of Moments (GMM) following Arellano and Bover (1995). The ‘‘GMM estimator’’ technique allows us to include an unobserved time invariant fixed effect by bank and control for persistence and endogeneity issues using the

¹² In our first attempt, we estimated all potential determinants of profitability in a single equation. Most of the foreign investor variables were not significant. Hence, we decided to follow the sequential approach presented here. We assume foreign participation not only affects profitability directly but also indirectly through its determinants.

¹³ Other problem is the theoretical endogeneity of the variables that capture the foreign investment since overseas investors will pick up the best-performer domestic partners. However, we expect that this potential problem is not very relevant since Chinese authorities are guiding the acquisitions. In other words, foreign banks appear not to have been able to choose the best local counterparts. On the contrary, anecdotal evidence suggests that the authorities matched foreigners with less-than-stellar performers. Table B-4 in the appendix shows that the performance of the local banks with and without foreign investors in any moment was quite similar until 2003 when the foreign entry was encouraged. However, we treated foreign participation variables as endogenous through the Arellano-Bover procedure.

lags of the dependent variables in levels and in differences, as well as lagged values of foreign banks variables.

The main problem in assessing the determinants of profitability is the potential endogeneity of certain determinants. For example, more profitable banks may have sufficient resources to provision for their NPLs. They may also find it easier to increase their customer base through a successful advertising campaign, and thereby enhance profitability. Finally, more profitable banks may hire the most skilled personnel and thereby influence their operational efficiency. To tackle these problems, we go beyond the methodology currently in use in the literature (fixed or random effects) and employ the Arellano-Bover estimator as at the previous stage. To avoid the risk of omitted variables, we also estimate a general equation that includes all possible determinants of profitability mentioned in the literature, as well as China's specific characteristics. Using a Wald test, we test the joint hypothesis that the coefficients of the variables that are not significant individually are equal to zero. If not rejected, we re-estimate the model only with the controls that were significant in the general regression. Otherwise, we test a less-restrictive hypothesis, while still trying to reduce the number of non-significant regressors as much as possible. This sequential (general to specific) specification strategy is followed until we reject that the remaining set of coefficients of the control variables (i.e. equal to zero). The coefficients obtained in this way has greater effect as the number of regressors is reduced to the minimum and allow us to identify the channels that truly affect profitability. Finally, given that our sample has a large N and a small T, macroeconomic variables (which do not change across N) must be estimated with very low degrees of freedom. Thus, we introduce a second model where macroeconomic regressors are substituted by time dummies.

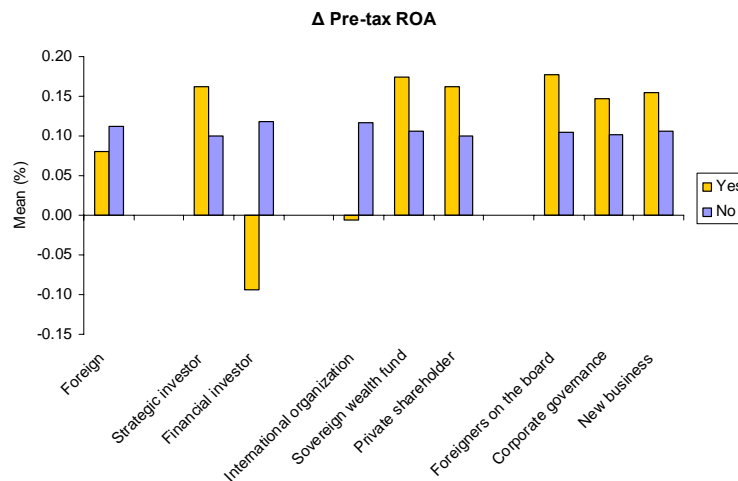
With the main determinants of profitability identified, we now estimate how the different types of foreign investment might influence them. We work from the assumption that the characteristics of foreign presence are exogenous to the main determinants of profitability. This is quite likely the Chinese case, where the entry of foreign investors has been carefully guided by the authorities. Under such circumstances, the fixed effect estimator should deal with unobserved heterogeneity and provide unbiased estimations.

5. Stylized facts

Before moving to the results, it is worthwhile to reflect on a few stylized facts of the relation between foreign ownership and bank performance. To this end, we calculate conditional means for the different aspects of bank performance. For example, we calculate the mean profitability of Chinese banks with foreign participation against those without foreign participation. Figure 2 shows banks with foreign participation have lower profitability overall. This pattern no longer holds, however, if we separate strategic from financial investors. Banks with foreign strategic partners are more profitable on average than those with no foreign investors. In the same vein, a bank that has engaged in any of the main features of a strategic agreement performs better than banks without foreign participation (i.e. the terms of the agreement grant the foreign investor a seat on the board, include a clause on improved corporate governance or open a new joint business between the two partners). Such positive

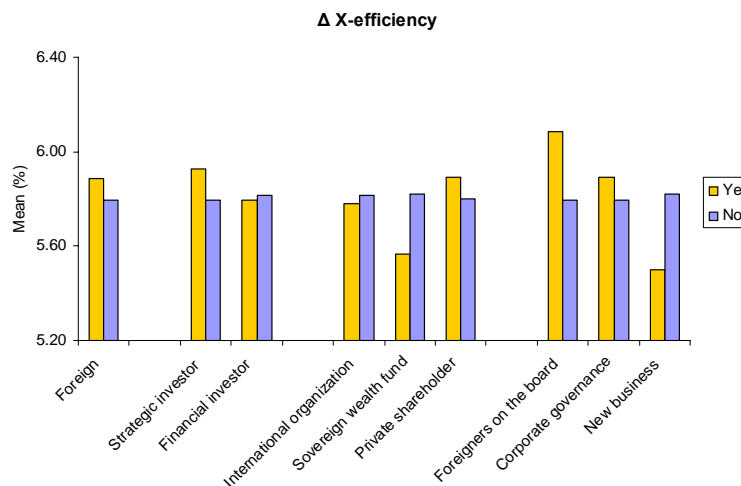
outcomes for strategic investors, at least from what can be seen from such simple stylized facts, contrasts markedly with that for financial investors, whose profitability is far lower than those of local banks without foreign participation. Regarding the ownership structure of foreign investors, banks with international organizations as foreign partners tend to be less profitable than those without any foreign investors. The opposite is true when the foreign investor is a sovereign wealth fund or a private shareholder.

Figure 2. Change in pre-tax ROA



Regarding efficiency, local banks with foreign partners perform slightly better than those without (Figure 3). This is especially true for banks with private strategic investors that have a seat on the board or a corporate governance agreement.

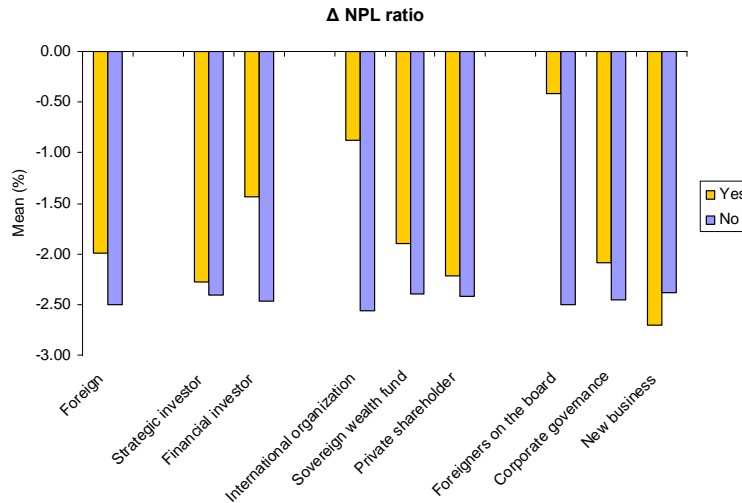
Figure 3. Change in X-efficiency



Chinese banks have generally improved their asset quality as seen from the general reduction in NPLs in Figure 4. However, banks without foreign investors seem to have been the most aggressive at cleaning up their balance sheets. In the case of banks with strategic investors, the difference is marginal. The same is true for private foreign investors. Much smaller reductions in NPLs are found for banks where the foreign partners are international

organizations. Finally, Chinese banks engaged in a new joint business with their strategic partners are associated with the largest reductions in NPLs.

Figure 4. Change in NPL ratio



The capitalization of Chinese banks with foreign partners, measured by the capital ratio, has increased markedly (Figure 5). This fact could seem relatively obvious as of the injections of foreigners should rather automatically increase the capital base. As before, banks with strategic partners (especially private) perform better. When capitalization is measured by the equity-to-assets ratio (which, unlike the capital ratio, was available for our full sample), this trend is not shown (Figure 6). This could well be related to the roughness of the proxy used.

Figure 5. Change in capital ratio

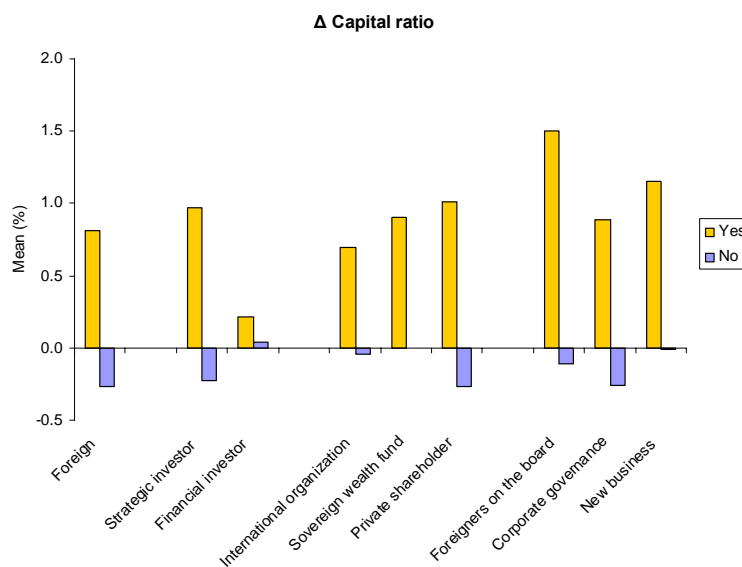
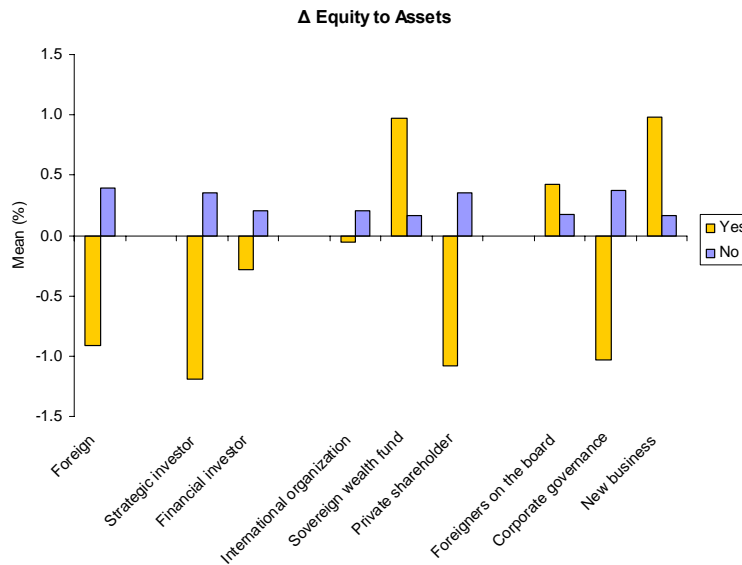


Figure 6. Change in equity-to-assets ratio



These stylized facts point to increased profitability for those Chinese banks with strategic partners or, at least, private investors. Such trend is generally maintained when analyzing other important aspects of bank performance such as efficiency, asset quality and capitalization. From pure statistical tools, we now move to panel regression analysis and test whether these preliminary findings are confirmed.

6. Results

We investigate the determinants of bank profitability in China with annual panel data for as many as 82 banks during the period 1999–2006. Despite data limitations, we follow a three-step approach that allows not only determination of the effects of foreign investors on profitability but also analysis of the channels through which such effects are transmitted. The methodologies employed at each stage account for unobserved heterogeneity across banks and, if necessary, potential endogeneity of regressors and persistence of profitability. This approach should yield consistent estimators of the parameters.

In the first stage, we assess the direct effect of foreign participation on the profitability of the Chinese banking system, measured by the pre-tax ROA (Table 2). Foreign investors tend to improve profitability; the larger the stake, the greater the improvement. This supports the hypothesis that foreign investment is beneficial for the domestic banking system as a whole. When breaking down the type of foreign investment into strategic and financial, the previous result only holds for the former, i.e. only strategic investors seem to manage to bring the benefit of better performance for the whole system. The coefficients of the strategic investment variables and their lags are significant at 99%, whereas the coefficients of financial variables are not found significant.

While private investors are found to bring benefits, international organizations and sovereign wealth funds do not. The positive effect is greater and more significant years after the agreement was reached, perhaps indicating other synergies arise once the adjustment is achieved.

Regarding agreement terms, we only find that corporate governance clauses are associated with higher contemporaneous profitability (at the 90% confidence level), whereas a seat on the board or strategic alliances to develop new businesses are not found significant in fostering the profitability of the banking system.

Table 2. Foreign investor's effect on profitability

Dependent variable: Log of pre-tax ROA	Foreign				Strategic Vs Financial				Public Vs Private		Agreement Terms	
<i>Foreign participation</i>	0.195** (0.031)											
<i>L. Foreign participation</i>	0.157* (0.060)											
<i>Foreign stake</i>	1.269*** (0.001)											
<i>L. Foreign stake</i>	1.372*** (0.000)											
<i>Strategic investor</i>					0.235*** (0.005)							
<i>Financial investor</i>					0.045 (0.603)							
<i>L. Strategic investor</i>					0.253*** (0.001)							
<i>L. Financial investor</i>					-0.022 (0.845)							
<i>Stake Strategic investor</i>					1.424*** (0.002)							
<i>Stake Financial investor</i>					0.988 (0.354)							
<i>L. Stake Strategic investor</i>					2.023*** (0.000)							
<i>L. Stake Financial investor</i>					-0.300 (0.760)							
<i>International organization</i>									0.029 (0.769)			
<i>Sovereign wealth fund</i>									0.186 (0.101)			
<i>Private investor</i>									0.185** (0.015)			
<i>L. International organization</i>									-0.165 (0.125)			
<i>L. Sovereign wealth fund</i>									0.195 (0.115)			
<i>L. Private investor</i>									0.266*** (0.001)			
<i>Foreigners on the board</i>											-0.001 (0.995)	
<i>Corporate governance</i>											0.193* (0.099)	
<i>New business</i>											0.141 (0.219)	
<i>L. Foreigners on the board</i>											0.239 (0.147)	
<i>L. Corporate governance</i>											0.115 (0.203)	
<i>L. New business</i>											-0.145 (0.394)	
<i>L. Log Pre-tax ROA</i>	0.623*** (0.000)	0.611*** (0.000)	0.600*** (0.000)	0.600*** (0.000)	0.619*** (0.000)	0.596*** (0.000)	0.586*** (0.000)	0.591*** (0.000)	0.617*** (0.000)	0.594*** (0.000)	0.609*** (0.000)	0.585*** (0.000)
<i>Constant</i>	-1.881*** (0.000)	-1.925*** (0.000)	-1.995*** (0.000)	-1.983*** (0.000)	-1.900*** (0.000)	-1.996*** (0.000)	-2.066*** (0.000)	-2.022*** (0.000)	-1.910*** (0.000)	-2.004*** (0.000)	-1.946*** (0.000)	-2.054*** (0.000)
<i>Observations</i>	274	274	274	274	274	274	274	274	274	274	274	274
<i>Number of banks</i>	78	78	78	78	78	78	78	78	78	78	78	78
<i>Hansen test</i>	(0.404)	(0.243)	(0.379)	(0.243)	(0.534)	(0.518)	(0.300)	(0.481)	(0.487)	(0.591)	(0.226)	(0.260)
<i>Arellano-Bond test for AR(1) in first differences</i>	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
<i>Arellano-Bond test for AR(2) in first differences</i>	(0.877)	(0.976)	(0.786)	(0.955)	(0.836)	(0.992)	(0.784)	(0.955)	(0.842)	(0.974)	(0.777)	(0.978)

Robust first stage p-values in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

In the second stage, we identify which are the main determinants of Chinese bank profitability (Table 3). We have two specifications: one including macroeconomic controls and another with time dummies to reflect the short time span of our sample (left and right columns, respectively). In addition, two regressions are shown for each specification: one for the full set of explanatory variables (first and third columns) and another with the restricted set based on the previously described Wald test of individual and joint insignificance (second and fourth columns). The estimators of the restricted specifications suggest that a higher X-efficiency (at more than the 90% confidence level), a lower NPL ratio (at the 99% confidence

level) and a higher equity to assets ratio (at more than the 95% confidence level) are important determinants of profitability. Therefore, we confirm that the most relevant channels through which profitability improves are efficiency, asset quality and capitalization.¹⁴

Table 3. Profitability Determinants

	(1)	(2)	(3)	(4)
	Macroeconomic		Yearly dummies	
Dependent variable: Log of pre-tax ROA	Jointly non-significant		Jointly non-significant	
<i>L. Log Pre-tax ROA</i>	0.477*** (0.003)	0.572*** (0.000)	0.459*** (0.003)	0.552*** (0.001)
<i>Technical efficiency</i>	0.809*** (0.000)	0.364* (0.069)	0.917*** (0.000)	0.546** (0.021)
<i>Log Transformation of NPL ratio</i>	-0.813 (0.165)	-0.705*** (0.000)	-0.591 (0.270)	-0.596*** (0.000)
<i>Log Equity over Assets</i>	-0.024 (0.809)	0.230** (0.013)	-0.056 (0.555)	0.188** (0.050)
<i>Log Loans over Assets</i>	0.243 (0.208)		0.178 (0.374)	
<i>Loans growth rate of bank i</i>	0.108 (0.263)		0.140 (0.161)	
<i>Log Deposits over Assets</i>	-0.140 (0.699)		-0.187 (0.616)	
<i>Listed</i>	-0.089 (0.489)		-0.056 (0.667)	
<i>Recapitalized</i>	0.011 (0.958)		0.048 (0.814)	
Market share on assets	-0.001 (0.299)	-0.001*** (0.003)	-0.002 (0.179)	-0.001*** (0.006)
<i>Concentration. Herfindahl Index</i>	0.000 (0.617)	-0.000* (0.054)		
Real interest rate on loans	55.584 (0.251)	28.824 (0.147)		
Maximum spread	-1.233 (0.964)			
Real GDP growth	10.651* (0.064)			
Inflation	55.786 (0.210)	33.743* (0.083)		
Log std. dev. of IBOR	-0.051 (0.829)			
Credit cooperatives	-0.063 (0.843)		-0.190 (0.564)	
JSCBs	-0.050 (0.822)		-0.150 (0.531)	
CCBs	0.083 (0.774)		0.000 (0.999)	
Observations	198	207	198	210
Number of Bank Name	61	68	61	71
Hansen test	(1.000)	(0.942)	(1.000)	(0.896)
Arellano-Bond test for AR(1) in first differences	(0.001)	(0.005)	(0.002)	(0.005)
Arellano-Bond test for AR(2) in first differences	(0.471)	(0.456)	(0.405)	(0.496)

Robust first stage p-values in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Variables in italics are treated as predetermined or endogenous

In the third stage, our goal is to evaluate the effects of foreign investment on the previously identified determinants of profitability and, hence, draw some conclusions on the channels

¹⁴ Other interesting results are a more concentrated banking system is found to reduce pre-tax ROA in a statistically significant way. In the Chinese case, the degree of concentration is very much related to the weight of the four SOCBs in the banking system. Since these banks are more affected by government intervention, the result could be interpreted to suggest that government ownership is detrimental to bank profitability in China. Another interesting finding is the persistence of the pre-provision profits, marked by the high significance of lagged variable that took into consideration in the first stage model. This could hint at government interference as banks are given yearly targets for asset quality and capitalization which makes it hard to have sharp changes in the business models, even if opportunities arise to increase profitability. Finally, from the macroeconomic variables included, higher real interest rates on loans and inflation appear to foster profitability. The latter results, however, should be treated with great care, given that a very small number of observations are needed to estimate macroeconomic variables.

through which overseas investors may influence the profitability of the Chinese banking system.

We first concentrate on *X-efficiency* (Table 4). The results are very similar to those for profitability:

- Foreign investors tend to enhance the efficiency of domestic institutions (the larger the stake, the greater the efficiency gain);
- Strategic investors bring higher efficiency gains than financial investors;
- Private investors enhance efficiency relatively more (and more significantly in some cases) than international organizations or sovereign wealth funds; and
- Among the agreement terms, only corporate governance provisions foster bank efficiency.

Table 4. Foreign investor's effect on efficiency

Dependent variable: Technical efficiency	Foreign		Strategic Vs Financial		Public Vs Private	Agreement Terms
Foreign participation	0.144*** (0.000)					
Foreign stake		0.808*** (0.000)				
Strategic investor			0.157*** (0.000)			
Financial investor			0.103*** (0.000)			
Stake Strategic investor				0.709*** (0.000)		
Stake Financial investor				0.118*** (0.000)		
International organization					0.095*** (0.000)	
Sovereign wealth fund					-0.017 (0.699)	
Private investor					0.115*** (0.000)	
Foreigners on the board						-0.004 (0.864)
Corporate governance						0.149*** (0.000)
New business						-0.022 (0.452)
Constant	-0.572*** (0.000)	-0.568*** (0.000)	-0.571*** (0.000)	-0.568*** (0.000)	-0.569*** (0.000)	-0.568*** (0.000)
Observations	338	338	338	338	338	338
Number of banks	82	82	82	82	82	82
R-squared	0.215	0.217	0.223	0.221	0.212	0.202

Robust p values in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Next, we investigate the influence of overseas investment on *asset quality* (Table 5). The results are also quite similar:

- Foreign participation tends to reduce the NPL ratio (the larger the participation the lower the NPL ratio);
- Strategic and financial investors both seem to promote asset quality, although the effect of the former seems stronger;
- Private investors seem to do a better job at reducing the NPL ratio; and
- Corporate governance is the only characteristic of the agreements that enhances asset quality.

Table 5. Foreign investor's effect on asset quality

Dependent variable: ln (NPL ratio/(1-NPL ratio))	Foreign		Strategic Vs Financial		Public Vs Private	Agreement Terms
Foreign participation	-0.984*** (0.000)					
Foreign stake		-4.859*** (0.000)				
Strategic investor			-1.033*** (0.000)			
Financial investor			-0.790*** (0.000)			
Stake Strategic investor				-4.876*** (0.000)		
Stake Financial investor				-4.805*** (0.000)		
International organization					-0.279 (0.103)	
Sovereign wealth fund					-0.197 (0.641)	
Private investor					-0.932*** (0.000)	
Foreigners on the board						-0.203 (0.517)
Corporate governance						-0.864*** (0.000)
New business						-0.001 (0.998)
Constant	-2.568*** (0.000)	-2.630*** (0.000)	-2.573*** (0.000)	-2.630*** (0.000)	-2.600*** (0.000)	-2.609*** (0.000)
Observations	263	263	263	263	263	263
R-squared	0.172	0.141	0.175	0.141	0.174	0.16
Number of banks	67	67	67	67	67	67

Robust p values in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Finally, we analyze whether foreign partners influence the *capitalization* of the banking system, measured by equity to assets ratio (Table 6). This is the only case where foreign investors seem to have no influence. Surprisingly, the only significant factor seems to be the establishment of a strategic alliance to develop a new business area, but just at the 90% confidence level. It should be noted, however, that the proxy used for bank capitalization is very poor. In fact, the stylized facts already showed that its evolution was quite different to that of the capital ratio, and unfortunately, only available for a few banks.

Generally, we find evidence that foreign investors (particularly strategic and private investors) exert a positive influence on the profitability of Chinese banks. The channels through which foreign investors seem to influence are mainly improved efficiency and asset quality.

Table 6. Foreign investor's effect on capitalization

Dependent variable: In Equity over Assets	Foreign		Strategic Vs Financial		Public Vs Private	Agreement Terms
Foreign participation	0.003 (0.967)					
Foreign stake	0.178 (0.615)					
Strategic investor			0.018 (0.777)			
Financial investor			-0.055 (0.588)			
Stake Strategic investor			0.119 (0.797)			
Stake Financial investor			0.355 (0.706)			
International organization					0.040 (0.727)	
Sovereign wealth fund					-0.042 (0.814)	
Private investor					0.022 (0.739)	
Foreigners on the board						0.015 (0.909)
Corporate governance						-0.063 (0.443)
New business						0.258* (0.079)
Constant	-3.146*** (0.000)	-3.149*** (0.000)	-3.145*** (0.000)	-3.150*** (0.000)	-3.150*** (0.000)	-3.143*** (0.000)
Observations	357	357	357	357	357	357
R-squared	0	0.001	0.001	0.001	0.001	0.009
Number of banks	83	83	83	83	83	83

Robust p values in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

7. Conclusions

Our empirical results support the view that China's gradual approach to bank reform through restricted and geared entrance of foreign investors has, so far, brought benefits to the Chinese banking system. Such benefits are only realized, however, when the foreign investor is actively involved (i.e. through a strategic partnership). To reap such benefits, a key term in the agreements between strategic investors and Chinese banks is the improvement of corporate governance. Having a seat at the board seems to more of a nominal than a real advantage. We also find that private foreign investors have more influence than public investors, no matter if they are international organizations or sovereign wealth funds.

In conclusion, the results show that the way in which China has opened up to foreign competition has so far been successful. However, a hypothetical issue remains open: Would China would have benefited even more from foreign investors taking larger stakes, and even controlling stakes, in Chinese banks?

Does China's model hold lessons for other emerging countries? The reality is that attracting foreign investors without granting control might be hard to make in many emerging countries (except perhaps the other BRICs: India, Brazil and Russia). However, if a country were able to do so, our results points to benefits, compared to a fully domestic financial system, at least when allowing for a strategic partnership. This conclusion seems intuitively correct as it conforms to the existing literature and can be explained in terms of transfer of technology, skills, etc. Our results also point to improved corporate governance playing a key role.

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Appendix A. The opening of the banking system to foreign competition

The opening of the banking system to foreign competition has been conducted in the light of a comprehensive reform of the Chinese banking system. Under current regulations, foreign banks can operate directly in China through branches or subsidiaries they establish themselves, or indirectly through minority participation in authorized domestic banks.

Chinese authorities have used foreign banks as catalysts of banking reform that encourages local banks to adopt good corporate governance and risk management policies. At the same time, authorities have shied away from a dramatic shake-up in the ownership structure of banks by limiting foreign investors to minority stakes.

With its accession to the World Trade Organization (WTO) in 2001, China took an important step towards opening up its banking system. In particular, the commitment to gradual increasing access of foreign banks in the provision of banking services over a five-year transition period implicitly signalled China's intent to reform and develop its financial markets.

In December 2003, the government issued foreign strategic investment rules that specifically granted foreign investors the possibility of taking minority stakes in local banks. The program served two purposes: its let foreigners finance the recapitalization of underperforming local banks and helped modernize the banking system as a whole through the transfer of international know-how into the Chinese context. Generally, the government sought to reduce the public interference in lending. More specifically, the chief regulator, the Chinese Banking Regulatory Commission, sought to keep tight control over foreign participation by limiting individual foreign ownership to 20% of a bank's capital, and joint participation to 25%, and requiring official approval of any stake purchase. Furthermore, foreign investors have been required to commit principles that include to long-term involvement (particularly, maintaining a minimum stake of 5% in the local bank for at least three years), management through the appointment of directors, improving corporate governance and cooperating in various business areas. Finally, the foreign strategic investor program prohibits foreign participation in more than two local banks to avoid conflicts of interest and market dominance.

New legislation governing subsidiaries and branches, adopted in December 2006, marked the end of the WTO transition period. The new rules call for equal treatment between foreign and local financial institutions.

Appendix B. Descriptive statistics

Table B-1. Descriptive statistics of the agreements

	Obs.	Number of 1	Std.		Min.	Pct. 1%	Pct. 99%	Max.
			Mean	Deviation				
Foreign participation	664	70	0.11	0.31	0	0	1	1
Foreign stake	664	-	0.01	0.05	0	0	0.25	0.34
Strategic investor	664	50	0.08	0.26	0	0	1	1
Financial investor	664	20	0.03	0.17	0	0	1	1
Stake Strategic investor	664	-	0.01	0.04	0	0	0.199	0.25
Stake Financial investor	664	-	0.00	0.02	0	0	0.124	0.15
International organization	664	29	0.04	0.20	0	0	1	1
Sovereign wealth fund	664	11	0.02	0.13	0	0	1	1
Private investor	664	55	0.08	0.28	0	0	1	1
Foreigners on the board	664	22	0.03	0.18	0	0	1	1
Corporate governance agreement	664	58	0.09	0.28	0	0	1	1
New business agreement	664	13	0.02	0.14	0	0	1	1

Table B-2. Descriptive statistics of the profitability determinants

	Obs.	Mean	Std.		Min.	Pct. 1%	Pct. 99%	Max.
			Deviation					
Pre-tax ROA	347	0.8	0.5	-0.7	0.0	2.1	2.2	
Equity over Assets	358	5.1	5.3	-10.8	1.2	22.6	78.3	
NPL ratio	263	9.3	8.3	0.2	0.3	38.2	41.4	
Technical profit efficiency	338	55.0	19.9	14.7	17.4	88.5	90.3	
Loans over Assets	358	55.8	12.6	11.0	30.8	94.8	96.4	
Loans growth rate of bank i	289	26.5	40.0	-36.6	-20.3	201.5	501.5	
Deposits over Assets	358	77.8	17.8	1.4	2.9	95.8	105.8	
Listed	664	0.06	0.23	0	0	1	1	
Recapitalized	664	0.00	0.05	0	0	0	1	
Market share on assets	358	1.3	3.3	0.0	0.0	16.7	18.9	
Herfindahl Index	664	560	164	298	298	763	763	
Real interest rate on loans 1 year (reference)	664	4.7	1.7	1.4	1.4	7.6	7.6	
Spread between 1 year loan and deposits rate	664	3.4	0.1	3.2	3.2	3.6	3.6	
Real GDP growth	664	9.4	1.1	7.6	7.6	11.1	11.1	
Inflation	664	0.9	1.5	-1.4	-1.4	3.9	3.9	
Std. dev. of IBOR	664	0.3	0.2	0.1	0.1	0.7	0.7	
SOCBs	664	0.05	0.21	0	0	1	1	
JSCBs	664	0.12	0.33	0	0	1	1	
CCBs	664	0.70	0.46	0	0	1	1	
Credit Cooperatives	664	0.10	0.30	0	0	1	1	

(1) All variables in percentages (except Herfindahl index and dummies)

Table B-3. Correlation among foreign investment variables

	Foreign participation	Foreign stake	Strategic investor	Financial investor	Stake Strategic investor	Stake Financial investor	International organization	Sovereign wealth fund	Private investor	Foreigners on the board	Corporate governance agreement
Foreign participation	1										
Foreign stake	0.87	1									
Strategic investor	0.83	0.87	1								
Financial investor	0.51	0.22	-0.05	1							
Stake Strategic investor	0.76	0.92	0.92	-0.05	1						
Stake Financial investor	0.68	0.71	0.40	0.61	0.38	1					
International organization	0.62	0.56	0.30	0.65	0.28	0.83	1				
Sovereign wealth fund	0.38	0.38	0.41	0.05	0.34	0.29	0.26	1			
Private investor	0.88	0.84	0.91	0.17	0.85	0.45	0.31	0.35	1		
Foreigners on the board	0.54	0.50	0.55	0.12	0.52	0.24	0.17	0.24	0.62	1	
Corporate governance agreement	0.90	0.88	0.92	0.20	0.85	0.56	0.38	0.38	0.91	0.60	1
New business agreement	0.41	0.45	0.45	0.04	0.43	0.29	0.08	0.66	0.47	0.46	0.46

Table B-4. Descriptive statistics of the performance of banks with and without foreign partners

<i>Subsample 1999-2003</i>	Institutions...	Average yearly increment (%)
Pre-tax ROA	Without foreign participation	-0.07
Pre-tax ROA	With foreign participation	-0.08
Pre-tax ROA	Total	-0.08
Profit efficiency ⁽¹⁾	Without foreign participation	5.60
Profit efficiency ⁽¹⁾	With foreign participation	4.96
Profit efficiency ⁽¹⁾	Total	5.27
NPL ratio	Without foreign participation	-3.78
NPL ratio	With foreign participation	-2.64
NPL ratio	Total	-3.04
Capital ratio	Without foreign participation	-1.49
Capital ratio	With foreign participation	-1.44
Capital ratio	Total	-1.45
Equity over assets	Without foreign participation	-0.03
Equity over assets	With foreign participation	-0.26
Equity over assets	Total	-0.14

(1) 1 for best-performing bank, 0 for the worst