The impact of foreign bank entry on Chinese banks and financial liberalization. Recent evidence.

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Abstract

Opening the market to foreign investors is an action which the Chinese government will take under the pressure of economic globalization. However, the impact on domestic firms and market needs to be investigated. This study uses disaggregate measures (foreign exposure index) to analyse how the entry of foreign banks affects domestic banks and the financial markets unlike previous studies which tend to employ aggregate measures (foreign banks number and foreign bank assets share). The results show that the entry of foreign banks has a significantly positive impact on the performance of domestic banks, which is in favour of the process of domestic financial liberalization.

Keywords: Foreign bank entry, domestic bank performance, financial liberalization, foreign exposure index

# Introduction

The opening up of financial services and the structural reforms of the domestic financial sector are two interwoven processes, but both aim at developing an efficient and competitive financial system to facilitate economic growth. Along with the expanded participation in The General Agreement on Trade and Services (GATS), policymakers have come to realize that the presence of foreign financial service providers can benefit the consumers, the financial industry through learning-by-doing, and the economy through efficiency gains. Thus, determining how exactly the presence of foreign banks affects the Chinese Banking system is a topic worth investigating.

Experiences from other countries seem to suggest that the presence of foreign investors in the local banking system can facilitate increased competition, improve allocation of credit, and aid easier access to international capital markets (Lee, 2002). But there are also costs associated with foreign investment. For example, if foreign banks attract the most profitable portion of domestic markets, it may lead to pressure on domestic banks, providing them an incentive for more risk taking. The evidence on the role of foreign banks in growth and stability is mixed (Jordan and Qi, 2006). The mixed evidence in the literature is an excellent motivation for us to provide a definitive answer regarding the role of foreign banks in growth and stability using the most recent data available to us. In 2003, the China Banking Regulatory Commission (CBRC) stipulated a 20–25 percent principle, whereby an individual foreign bank could hold a maximum of 20 percent in the stock of a local bank, and the total holdings of foreign banks in any local bank must not exceed 25 percent.

This study is focused on the effect of foreign bank presence on Chinese bank performance. There are two policy questions this study tries to answer. The first question is whether opening up the bank sector positively influences the local banking industry. There exist some positive effects such as technology transfers, product innovation, and the enhancement of competition within the industry. These effects can help local bank enhance their efficiency and profitability (Claessens et al, 1998). However, foreign bank presence may also lead to financial instability (Shen et al, 2009). The other question is whether the percentage of shares held by foreign investors affect local bank performance. To answer these questions, this study employed three different measurements: MacroFP, MicroFP and foreign exposure index.

Claessens et al (2001) and Lensink & Hermes (2004) defined MacroFP as the percentage of foreign banks in the total number of banks in a country, which captures the overall scale of foreign presence in the host country over a period of time and is therefore useful in a cross-country analysis. But in this study, a different definition of MacroFP has been used. In this study, MacroFP is measured as the ratio of Chinese Banks with foreign bank investor to the total number of Chinese banks (Shen et al., 2009) Therefore, MacroFP can be used to answer the question regarding the opening up of the Chinese banking market. This study also employed another two bank-level measures of foreign presence for Chinese banks (Foreign exposure Index and MicroFP). The Foreign exposure Index uses the number of foreign bank branches operating in the city where a specific Chinese bank is located to capture foreign presence while MicroFP is the percentage shareholding of foreign investors in a Chinese bank and acts as a proxy for foreign bank influence. These measurements provide a more accurate measurement of foreign presence at the bank level and local level where the actual influence is felt.

By using all these measurements, this study provides more accurate results. Specifically, results from aggregate measurements which include the number of foreign banks operating in the host country and asset of foreign banks operating in the host country suggest that foreign bank presence boosts the performance of the Chinese banking sector (Shen et al., 2009). Therefore, the opening up policy of China has clearly been effective in terms of increasing profits following the introduction of foreign investment. By using the foreign exposure index, the results also suggest that increased foreign presence in China is associated with a competitive and developed banking sector. However, the findings of this study indicate that the influence of MicroFP on the performance of domestic bank is insignificant, which means that for those banks that have already introduced foreign investment, releasing more shares to foreign investors might not increase profits. It is important to note that, this insignificant impact of MicroFP on domestic bank performance is unrelated to the impact of MicroFP on domestic financial liberalization.

Notwithstanding the conventional view of the positive role of finance for growth, a good financial system with a well-functioning competitive market as well as, a well-supporting financial institution are essential ingredients for sustainable economic growth (Lee, 2002). In the wake of internationalization of the financial sector, internationalization of the banking sector through increased foreign bank presence has been more important than ever. It has also been observed that as a result of financial liberalization, globalization of financial markets has gained additional momentum. Thus, investigating the importance of foreign bank presence on financial liberalization is essential. In this study, apart from examining the effect of foreign bank entry on domestic bank performance, the relationship between foreign bank entry and domestic financial market liberalization is also examined.

Overall, this study contributes to the literature in following ways. Firstly, the data used in the paper is the most up-to-date dataset available and covers the period from 2009 to 2016, including Bankscope, Almanac of China’s Finance and Banking and the Annual report of China’s Banking Regulatory Commission. The time period covered by the most recent study is limited to 2013 (Li et.al, 2015) However, Li et.al (2015) only investigate the impact of foreign bank entry on financial markets. This study not only does it use a more recent data sample (from 2009 to 2016), but it also analyses the impact of foreign bank entry on domestic firms (banks) as well. Secondly, in relation to existing literature (Shen et al., 2009; Bayraktar and Wang, 2004; Huang et al., 2014; Lee, 2002), this study not only does it use aggregate measurements but also employs MicroFP and foreign exposure index. These measurements together guarantee a more accurate result. Thirdly, previous literature concentrates on assessing the relationship between foreign bank presence and domestic bank performance (Hermes & Lensink, 2004; Shen et al., 2009; Lee, 2002; Xu, 2011; Gormley, 2010; Jeon et al, 2011) but they place little importance on how foreign bank presence affects financial liberalization[[1]](#footnote-1). In this study, both aggregate measurements (the number of foreign banks operating in the host country and asset of foreign banks operating in the host country) and disaggregate measurements (foreign exposure index) are employed to estimate the degree of the impact of foreign bank presence on financial liberalization and domestic bank performance. Even though aggregate measurements, especially the MicroFP, yields an insignificant result regarding the impact of foreign bank presence on domestic bank and market, the results of three performance indicators (net interest margin, noninterest income and cost) and one financial liberalization indicator (bank privatization rate) using more accurate disaggregate measurement show that foreign bank presence in China is highly and significantly associated with a competitive and developed banking sector and financial market.

To summarize our motivation for this study is to provide a definitive answer regarding the role of foreign banks in growth, stability and financial liberalisation in China (given the mixed evidence in the literature) using the most recent data available to us and employing both aggregate and disaggregate measures (MicroFP and foreign exposure index) which together guarantee a more accurate result.

This paper is organized as follows: Section 2 will discuss the existing literature. The hypotheses to be tested, are listed in Section 3. Section 4 and 5 will provide details about the dataset and the method(s) used for analysis. Section 6 will summarize the results and section 7 will discuss the results and provide ideas for further research.

# Literature Review

## 2.1 China’s Banking System

There are four types of commercial banks in China: state-owned banks, joint-stock banks, city banks and rural banks. State-owned banks are directly controlled by the government while joint-stock banks are governed by stockholders which are not limited to the government. City banks and rural banks are mainly controlled by the government but there is also a small amount of private control present. Each type has its own distinctive features on size and geographic branch coverage. State-own banks are the largest banks in China. All five state-owned banks contributed 36.8% to the total commercial bank assets in 2016. Also, these five banks have nation-wide branch coverage and cover nearly all large cities in China. There are twelve joint-stock banks in China, together they make up 19.1% of total commercial bank assets in 2016. These banks started building up branches in particular regions and now they have rapidly expanded to achieve national coverage. Unlike state-owned banks and joint-stock banks, rural banks and city banks are small in size but have the largest number of branches. They are city or town-based and they offer limited and area-specific banking services (Xu, 2011; Chen and Xiao, 2007; Chuan, 2001). Altogether, today there are 3 policy banks, 5 state-owned banks, 12 joint stock commercial banks, 1 postal saving bank, 120 city commercial banks, 65 rural commercial banks, 31 urban credit cooperatives, 86 new rural financial institutions and 75 foreign financial institutions in the Chinese Banking sector (Zhang and Daly, 2014).

China has one of the largest banking sectors in the world. At the end of 2016, the total assets of the banking sector were 212 trillion RMB which is equal to 316% of GDP. However, China’s banking system is far from being a developed and efficient system. In 2003, the ratio of non-performing loans to total loans was over 20% while the ratio is 3.1% on average in Europe. To address the high ratio of non-performing loans and low efficiency in the banking sector, the Chinese government has launched a banking reform which has taken two forms: banking restructure and financial liberalization (Xu, 2011). Banking restructure is characterised by capital injections from central bank and non-performing loans disposal. The results were amazing, the ratio of non-performing loans to total loans is 1.53% in 2018 while the ratio is 3.6% in Europe, 1% for US and Japan (Magnus et al., 2018). Meanwhile, financial liberalization includes the removal of credit plan, gradual liberalization of interest rates, and opening up to foreign competition (Huang and Qin, 2009; Liu, 2008). Before 1978, China’s banking system was operating under a nonbank financial system (Zhang and Daly, 2014). In 1979, the Chinese government started to apply the credit plan, which means that the gap between loans and deposits are controlled by the central bank, loans are limited to local bank’s own deposits. In 1985, the central bank releases control on interbank lending. The amount of loans the local bank can approve is not only limited to its deposit size. In 1998, the credit plan is removed, the central bank no longer controls loans and deposits.

Traditionally, foreign entry in the banking sector in China has been highly regulated and subject to strict entry requirements which include minimum entry capital requirements, previous presence in China and minimum total assets. Moreover, consumer type, location and range of business such as currency denomination are also regulated for foreign banks. For example, in 1985, foreign banks can only operate in Shanghai, customers are limited to foreign firms and individuals, and the currency denomination is foreign currency only. However, after China was acceded to WTO at the end of 2001, those restrictions were gradually lifted. Especially after December 2006, there are no discriminatory restrictions on foreign bank entry and banking business in China. Foreign banks enjoy the same treatment as local banks. The number of foreign bank entities in China was 192 in 2003, 211 in 2004, 254 in 2005, 312 in 2006, 440 in 2007 and in 2017 this number has increased to 1013. The total assets of foreign bank entities have increased from 300 billion RMB in 2001 to 3.24 trillion RMB in 2017.

## 2.2 Foreign spillover theory

The foreign spillover theory points out that multinationals must possess some firm-specific advantages to overcome the disadvantages of operating overseas such as culture, language barriers, and local business practice (Hymer, 1960; Caves, 1974; Dunning 1980,1983). Blomstrom and Kokko (1988) concluded in their study that firm-specific advantages usually include superior production technologies and advanced management skills. Dunning (1983) also counted intangible advantages such as brand names, trademark, or reputation for quality as firm-specific advantages. Meanwhile, multinationals which operate in a foreign country could generally produce “spillovers” through channels such as demonstration, personnel training, and competition (Blomstrom and Kokko, 1988).

Even though related research focuses more on the manufacturing industries, Dunning (1989) suggested that the FDI spillover theory is well-positioned and could be readily applied to the services sector, as Glodberg (2004) has applied the theory in the financial sector. There exist some close counterparts of technology transfer and productivity in financial sector FDI literature. Also, Glodberg (2004) noted that efficiency improvement is a result of foreign entry to the hosting country’s financial or bank sector.

Levine (1996) said there are two channels where foreign bank presence may positively influence domestic bank efficiency. The first channel is through technology transfer. “Foreign bank may directly bring new and better skills, management techniques, training procedures, technology, and products to the domestic market” (Levine, 1996, p.91). The other channel is competition. Levine (1996) concluded that stimulating competition in domestic financial sector will place downwards pressure on profits and overheads expense and, in turn, enhance domestic bank efficiency.

## 2.3 Foreign bank entry in the domestic banking sector

In 1979, foreign banks are first allowed to establish representative offices in China and to open up branches in special economic zones in 1982. In 1996, the government has relaxed the geographic restriction to 23 cities in China. However, the licence foreign banks have been granted is limited, the business they are allowed to do is foreign currency deposits and loans while the clients are limited to foreign firms and individuals. In 2006, 5 years after China joined the WTO, the geographic, client and business restrictions were lifted, and most foreign bank received the same treatment as local banks.

However, as Chan et. al (2014) state in their study, there are still several challenges faced by foreign banks. Firstly, foreign banks faced a plethora of rules and regulations. For example, some foreign banks need to file 6300 different reports annually, its parents bank only need to file 400 reports in the home regulator. Secondly, even though China has opened its market to foreign banks, foreign banks still have limited access to China’s bond market, which is the fourth largest in the world. The third challenge is the capital and liquidity constraints. Furthermore, there are two operation challenges: attracting and retaining well-qualified and skilled personnel, and the legal environment (Chan et.al, 2014).

The ratio of foreign banks assets over total assets in the banking sector has dropped to 1.3% at the end of 2017. But the assets of foreign banks have increased from 300 billion RMB in 2001 to 3.24 trillion RMB in 2017. There are several reasons for this situation. Firstly, the fast economic growth of China “contributes to enormous accumulation of assets in domestic banks, which outpaced the growth of assets in foreign banks (Xu, 2011, p.888). Secondly, foreign banks activities are concentrated in a few cities. For example, the ratio of foreign banks asset over total assets in the banking sector in Shanghai is 10.2%, while the national ratio is 1.3% in 2017. Thus, the national aggregate ratio is not reflective of actual foreign bank presence and the impact level.

Notwithstanding, there are a few things which the Chinese government and the local banks can learn from foreign bank presence. Apart from the traditional banking business, such as deposits and loans, the foreign bank’s main focus is always on the niche markets and fee-based banking business (Xu, 2011). By 2004, foreign banks have introduced over 100 financial products to the market which is three times higher than the local banks can provide. Experience and expertise in niche markets and fee-based products promise benefits for the Chinese banks which are relatively inexperienced in these areas. Secondly, foreign bank presence also boosts the efficiency of the banking sector and the firm’s productivity in China. Li et al. (2015), using an unbalanced panel dataset covering 75 commercial banks from 2009 to 2013, find that foreign bank entry is significantly associated with increased competition in the banking sector and bank efficiency. Moreover, Li and Huang (2015) suggest that the presence of foreign banks significantly affects industrial productivity. Also, Chan et. al (2014) also point out that as China is in the process of opening up its market to the world and undergoing the internationalization of RMB, foreign banks will have more opportunities than ever before and foreign banks will play an important role in the opening-up of the market and a rebalancing of the Chinese economy.

The benefits and cost of foreign bank entry are investigated extensively in literature. The World Bank (2002) summarized the benefits which foreign bank entry may bring. Those are as follows: i) foreign bank entry increases the efficiency and competition of domestic banking sector which tends to reduce the cost and increase profits (World Bank, 2001; Claessens et. al, 1998); ii) as the evaluation and pricing of credit risks are expected to be more sophisticated, the allocation of credit to private sector may improve (Clarke et. al, 2001; Barth et. al, 2001); iii) foreign bank entry helps build a domestic banking supervisory and legal framework and enhances the overall transparency (Bayraktar and Wang, 2004); iv) “it is expected that foreign banks will provide more stable sources of credit since they may refer to their parents for additional funding and they have easier access to international markets. Thus, domestic financial markets will be less vulnerable to domestic shocks” (Bayraktar and Wang, 2004, p.4); v) foreign banks may reduce the cost associated with recapitalization and restructuring banks in the post-crisis period. Also, as Garcia-Herrero and Santabarbara (2008) cited in Zhang and Daly (2014) state, ‘the Chinese banking sector has benefited from foreign bank presence through higher profitability and increased efficiency.’

However, there are also costs pertaining to the presence of foreign banks. As Hellmann et al, (2000) stated, domestic banks may possess an incentive to take more risk when the franchise value of the domestic bank decreases with foreign bank entry. When foreign banks enter into the domestic market, competition increases, and the deposit-rate is either eliminated or reduced, thus the franchise value of domestic bank is decreased. In addition, domestic banks are not the only ones offering banking services, thus the franchise value could be even lower. Bayraktar and Wang (2004) also pointed out that the presence of foreign banks may increase the financial instability which, in turn, may lead to access to credit becoming impaired for some sectors of the economy.

Denizer (2000) concluded that net interest margin, overhead expenses, and returns on assets are related to foreign ownership in Turkey. His study also showed that foreign bank entry has a strong competitive effect on the domestic market. Hasan and Marton (2000) argued in their study based on Hungary that the presence of foreign banks is associated with higher efficiency in the domestic bank sector. Moreover, Goldberg et al (2000) uncovered that diversity of ownership tends to contribute to greater stability of credit in times of crisis and domestic financial system weakness in Mexico and Argentina.

Claessens et al (1998) investigated the effect of foreign bank entry on the domestic banking sector by using data covering the period between 1988–1995. Their sample includes all OECD countries and many developing countries. Even though the dataset they employed included China, the total number of banks in China in their dataset is only 5. They concluded that with the presence of foreign bank profitability, overheads of domestic banks move downwards.

Meanwhile, Demirguc-Kunt and Huizinga (1999) showed that in developing countries, foreign banks generally record higher profits and margins compared to domestic banks. Demirguc-Kunt et al (1998) also pointed out that foreign bank entry lowers the profits and overheads costs of domestic banks while raising the efficiency of domestic banks. Again, in both of these two studies, the number of banks in China included in the dataset is extremely low, 5 and 6 respectively.

Also, Zhang and Daly (2015) investigate the impact of opening up, on domestic bank performance using data covering the period from 2004 to 2010. All the three variables (economic globalization, social globalization and political globalization) which they use to measure the openness of domestic market are found to be significantly positively related to domestic bank performance. They conclude that: i) China’s banking sector development is stimulated by the expansion of international trade and investment, ii) even though foreign bank presence has levelled up the competition in the banking sector, domestic banks’ performance is improving, iii) the opening up of the domestic market boosts cultural mixing and information globalization which decrease transaction costs and iv) political globalization also supports bank performance although the effect is lower than economic and social globalization.

Generally speaking, existing literature on the relationship between foreign bank presence and domestic bank performance in China is limited. Even though there are some studies which have included China in their sample, the sample is too small to capture the whole Chinese Market. In addition, the time period of dataset employed by other studies conducted by Xu (2011), Shen et al (2009), Bayraktar and Wang (2004) are from 1999-2006, 1997-2007, and 1995-2002 respectively, which is considered outdated by today’s standards. This study provides more recent results by employing the most up to date dataset (from 2008 till 2016) and focuses only on the Chinese banking sector.

## 2.4 Financial liberalization

In many developing countries, financial sector reforms have been generally pursued as part of broader structural adjustment programs, bringing about a significant economic benefit through a more effective mobilization of domestic savings and more allocation of resources. As shown by Qian (2000) and Sorsa (1997), lower income countries tend to have more restrictive entry regimes. In terms of the factors that determine differences in commitments, it appears that a country’s income level, the openness of its economy to trade in goods, and the depth and competitiveness of its financial sector are positively associated with a country’s interest in opening up (Lee, 2002). Thus, countries with less-developed financial systems considered the gains from internationalization so large that they wanted to open up entirely. Notwithstanding the investigation of the financial liberalization process in MENA countries, Lee (2002) argued that a more liberalized financial sector can be implicitly protected by a safeguard scheme of regulation on banking ownership.

It has been long argued that financial liberalization yielded greater financial depth and increased allocation efficiency of investment. Since financial liberalization generally increases the likelihood that markets operate effectively, banks operating in developed financial markets will become efficient (Bekaert et al, 2001). Reinhart and Tokatlidis (2002) stated that financial liberalization always boosts the real interest rate which is likely to encourage saving and expand the supply of credit available to domestic investors. Thus, although financial liberalization would promote the development of the financial market, it would also bring the risk of financial crisis to the market (Williamson and Mahar, 1998). When an economy includes strong institutions, the impact of financial liberalization on the fragility of the banking system will be mitigated through changes in those institutions, supporting a better functioning of the financial market (Demirgüç-Kunt and Detragiache, 1998; Kaminsky and Schmukler, 2002). Furthermore, Sorsa (1997) stated that financial liberalization has little correlation with the level of financial sector development, especially in the developing countries members of General Agreement on Trade in Services (GATS). Moreover, financial liberalization is associated with lower concentration ratios, an increased presence of foreign banks, and higher capitalization (Vives, 2000) Meanwhile, Li (2014) argues that liberalizing China’s financial market is a component of economic reform and of opening up to the global market. In other words, foreign bank presence is connected to the China’s financial market liberalization.

China has been experiencing fast economic growth and increased financial liberalization in the last thirty years. As the largest emerging market with many years of uninterrupted fast growth, China is an interesting case for further study. Financial liberalization in China is characterised by a gradual decline in state sector and a growing importance of collective, individual and foreign enterprises. China’s financial liberalization occurred in two dimensions: the internal dimension and external dimension. Internally, China’s financial liberalization starts with marketisation and privatisation (Cheng, 1997; Byrd, 1983; Li, 1994; Yi, 1994; Dipchand et al., 1994; Tang and Li, 1997). External financial liberalization is concerned with the inflow of foreign direct investment, loans from foreign governments and international organizations (Li and Liu, 2001). Thus, foreign bank entry is connected to China’s financial liberalization.

However, China is opening its financial market to foreign banks. As foreign banks are more skilled and adapted to the liberalized market, the process of financial liberalization in the Chinese market will allow them to better “differentiate products on both price and risk” (Chan et al, 2014, p. 10). But Chan et. al (2014) also state that given that the financial market is more liberalized, domestic banks can now determine their own interest and deposit rate, they can choose a lower rate and ease the burden of SOEs. Sara (2019) states that the interest rates liberalization, helped to lift the interest rate ceiling in 2015. This will significantly benefit the large domestic banks which will help them to have a stronger market position than all other types of banks in China.

# Hypotheses to be tested

## 3.1 Net Interest Margin and hypothesis 1

Jia (2016) states that the opening up of the domestic market is positively related to improvements and cost efficiency at domestic banks. Improvements in competitiveness and cost efficiencies can be captured by Net Interest Margin. Net Interest Margin is the interest income minus interest expense divided by total earning asset. Foreign banks’ entry increases the market competition which, in turn, increases the pressure the domestic banks face. Domestic banks need to increase deposit interest rate or lower the lending rate to retain their market share. These two methods will both narrow the interest margins and improve the competitiveness of the local bank industry.

*Hypothesis 1: Foreign bank entry will result in lower net interest margin of domestic banks.*

## 3.2 Noninterest income and hypothesis 2

Noninterest incomes are income generated from non-lending operations, including investment banking and brokerage services. According to a PricewaterhouseCoopers survey (PricewaterCoopers, 2007) and the annual report of China’s Banking Regulatory Commission (2008), foreign banks in China focus on noninterest niche markets such as credit card, fund management, securities trading, and trade finance. Chinese banks admitted that they are lacking experience in noninterest bank business which reduces their profitability but are willing to catch-up. Also, Zhang and Daly (2015) argue that the presence of foreign banks triggers more trade and capital flow in the banking sector, which in turn increases the profitability of domestic banks.

*Hypothesis 2: Foreign banks’ entry will boost the noninterest income of domestic banks.*

## 3.3 Cost and hypothesis 3

The FDI spillover theory suggested that foreign banks’ entry increases the competition in the local industry, thereby inducing efforts of cost reduction by local banks. But the cost reduction only happens in the long run; in the short run, the cost will increase (Lensink and Hermes, 2004). In the short run, domestic banks often spend more on new facilities and technologies to upgrade their service, implement new services, and also, they are likely to increase salaries to attract skilled personnel. Before China opened its doors to foreign banks, domestic banks lacked motivation to develop new products or instruments to stimulate their profits’ growth under the monopolistic nature of China’s bank-based economy. However, after the restrictions regarding foreign banks’ entry were gradually lifted, domestic banks were forced to spend more on products or instruments to catch up with foreign banks which increased their costs (Ding, 2015).

*Hypothesis 3: Foreign banks’ entry will increase the cost of domestic banks.*

## 3.4 Financial sector liberalization and hypothesis 4

Foreign bank entry is believed to be connected to the financial liberalization in the host country. Foreign banks may introduce modern and more efficient techniques which are new to domestic banks. Also, foreign banks’ presence leads to improvement of bank regulation and supervision because foreign banks may demand an improved system of regulation and supervision from regulatory authorities in the domestic market (Chen and Xiao, 2007). As a result, there will be a reduced influence of the government on the domestic financial sector, which in turn may reduce financial repression policies such as interest rate control, direct credit policies, etc (Huang and Qi, 2009). Thus, by reducing government control in the domestic financial market, foreign bank presence contributes to the liberalization of the financial sector (Jiao 2008). However, the number of studies focusing on testing the relationship between foreign bank entry and financial liberalization in China is very limited. Moreover, empirical results from Barajas et al, (2000) in Colombia, Claessen et al, (2001) in 80 countries, which includes China but the sample size related to China is only 5 banks, and Clarke et al (1999) in Argentina also support the point that foreign bank entry is associated with financial liberalization. Li and Ma (2004) investigate the relationship between the opening-up of the banking sector with the liberalization of financial markets in China. They find that allowing foreign banks to enter the domestic market can effectively deepen the banking reform process of the Chinese financial markets. This allows us to set up the hypothesis below:

*Hypothesis 4: Financial sector liberalization is positively associated with foreign bank entry.*

Moreover, the FDI spillover theory suggested a decrease in account profits due to the competitiveness. However, account profit is the net interest margins plus noninterest income minus cost and loan loss provisions. As the foreign banks’ entry is expected to have a positive effect on noninterest incomes and a negative effect on net interest margin, the effect of foreign banks entry on account profits is ambiguous. In other words, the account profits of domestic banks will either increase or decrease after foreign bank’s investment enters the market.

# Methodology

In this study, the following models/equations have been employed to investigate the effect of foreign bank presence on domestic bank performance and financial liberalization. Analysis takes place at three different stages and each model/equation corresponds to a different stage:

$$Indicator =α+βX\_{it}++θFEI\_{it}+νMicroFP\_{it}+δMacroFP\_{it}+λ\_{t}+ε\_{i,t } (eq 1, used in 1st tage of analysis)$$

$$Indicator=α+βX\_{it}+θFEI\_{it}+γ\_{1}Indicator\_{it-1}+γ\_{2}Indicator\_{it-2}+(θFEI\_{it}×Year Dummies)+λ\_{t}+ε\_{i,t} (eq 2, used in 2nd stage of anlysis, GMM model)$$

$Indicator=α+βX\_{it}+θFEI\_{it}+CT\_{it}+λ\_{t}+ε\_{i,t}$ (eq 3, used in 3rd stage of analysis)

Where $Indicator $is the dependent variable (Y). The indicator measures bank performance and bank privatization rate. Bank performance in turn is captured by ‘net interest margin’, ‘noninterest income’, ‘costs’ and ‘accounting profit’ for domestic bank *i* and time *t* as presented aboveand bank privatization is captured by ‘bank privatization rate’ which is equal to (1 – number-based share of state-owned banks); $FEI\_{it}$ is the bank-level foreign exposure index; $MacroFP\_{it}$ is the country level percentage of foreign banks out of the total number of banks in China;$ MicroFP\_{it}$ is percentage shareholding of foreign investors in a bank; $λ\_{t}$ is a vector of year dummies, capturing all effects that change over time such as regulatory reforms and other external shocks; $CT\_{it}$, is city variables which include real GDP growth and openness proxied by real foreign direct investment to GDP ratio in city i at time t. α is a constant, and $β,θ,ν,δ$, $γ\_{1}, γ\_{2}$ are coefficients. $ε\_{i,t}$ is the error term. $ X\_{it}$ is the vector of bank specific variables (which control for factors affecting cross-bank variation in performance according to Claessens et al. (2001)) and includes ‘equity’, ‘non-interest earning asset’ and ‘customer and short term funding’.

Specifically, equity for a bank is a cushion again decline in assets and it measures the degree of protection available to a bank. Berger (1995) identified in his study that there is a positive relationship between bank performance and equity. Non-interest income mainly consists of cash and non-interest earning deposits at other banks, so the non-interest income may have a downward effect on the net interest margin. Moreover, customer and short-term funding includes demand deposits and fixed deposits[[2]](#footnote-2). These types of customer funding offer low interest but require branching network which is connected to bank performance (Xu, 2011).$ $The first stage of analysis is undertaken by using equation 1. Notwithstanding, comparing to existing literature which uses macro variables such as GDP growth, real interest rate and inflation rate to analyse the impact of foreign bank presence on domestic market, this study uses year dummies as a replacement. Year dummies help to neutralize the time-specific effect which is related to bank performance and financial liberalization but not related to the focus of this study (the impact of foreign bank presence).

Bank variables such as ‘equity’, ‘non-interest earning asset’, and ‘customer and short-term funding’ may be endogenously determined in the model as the dependent variables can influence their level. Given the presence of endogeneity, Difference Generalised Methods of Moments is adopted in the second stage by using equation 2. Furthermore, as FEI is assumed to be homogenous across years, we use interactive year dummies with FEI to relax the homogeneity assumption.

However, as FEI is essentially a city-level indicator, it might proxy for city factors that are correlated with bank performance. For example, economic growth or openness of the economy will affect bank performance in general. Thus, in the third stage, city variables $CT\_{it}$ (which include real GDP growth and openness proxied by real foreign direct investment to GDP ratio in city i at time t) have been included. For this reason, we use equation 3. However, as the national and regional banks cover multiple cities and are difficult to reflect in the reduced sample in the third stage, the test is conducted on city-bank sample.

# Data

Panel data is employed in this study, expanding from 2008 to 2016 covering all Chinese banks. Specifically, the panel includes all state-owned banks, joint-stock banks, city banks, rural banks, and rural credit cooperatives.

Unfortunately, information is not provided for every single bank in every single year, making the dataset unbalanced. Also, some observations have been dropped because of missing important variables.

The main data source is Bankscope which provided the bank-level data. Macroeconomic data such as GDP growth rates, inflation rates, and real interest rate, are collected from World Bank’s World Development Indicator database. The data concerning the total number of foreign banks and total assets of foreign funded banks are collected from the Almanac of China’s Finance and Banking 2008–2016 and the Annual report of China’s Banking Regulatory Commission 2008–2016. *As the annual report of China’s Banking Regulatory Commission after 2016 has not been released, the dataset used in this study is limited to 2016.*

## 5.1 Foreign Exposure Index

In this study, in order to reach a more accurate result, the foreign exposure index, developed by Ying Xu (2011), is employed. This index measures the degree of foreign exposure at the bank level. As city is a natural boundary of foreign bank influence, this index uses the number of foreign bank branches operating in the same city where Chinese banks operate to determine the degree of foreign exposure for the banks in question.

This index can capture the degree of foreign exposure each domestic bank faces compared to its peers. As the cross-sectional maxima vary over time, the benchmark of this index is set as the panel maximum. In other words, the maximum number of foreign bank branches present in a city over the whole observation period.

There are mainly four types of banks in China: rural bank, city bank, joint-stock bank, and state-owned bank. Across the observation period, the number of foreign bank branches in rural areas in China is equal to zero, so the FEI of rural bank is equal to zero. Also, as the activities of city banks are always limited to the city they are located in, the FEI of a city bank is equal to the FEI in that city. So, the FEI for a city bank *i,* whichoperates in city *m* in year *t* is:

$$FEI\_{i,m,t}^{CB}=\frac{N\_{m,t}}{Max\_{N}}$$

Where Nm,t/MaxN is the ratio of the number (N) of foreign bank branches in city *m* in year *t* over the panel maximum N.

City banks, state-owned banks, and joint-stock banks set up different branches in different cities, and each city has a different level of foreign exposure. Thus, it is not obvious as to which level represents the bank’s overall level of foreign exposure. Therefore, the FEI of state-owned bank or joint-stock bank *i* with a set of branches in cities *m*, (*m=1, 2,…,k)* in year *t* is measured as follows:

$$FEI\_{i,m,t}^{Joint stock B, State Bank}=\frac{Max N\_{t}^{M}}{Max N}$$

Where Max NMt/Max N is the ratio of maximum number of foreign bank branches among *m* cities where a state-owned bank or a joint-stock bank has branches in year *t* to the panel maximum.

However, by using these two formulas, an implicit assumption is made which is ‘the homogeneity of foreign bank branches’. In other words, each foreign bank branch is treated equally and is seen to impose the same level of influence on local domestic banks across cities and time. There are two factors that justify this assumption. Firstly, when thinking of adding ‘weights’ to relax the homogeneity assumption, it is found that the number of foreign banks branches is already weighted in China. The greater the number of branches a foreign bank has, the greater the influence it has on domestic banks. Foreign banks have a greater number of branches in developed cities such as Beijing and Shanghai than other cities. Therefore, adding ‘weights’ would offer limited help (Lin, 2011). Secondly, due to data limitations, other data such as ‘total asset’ or ‘volume of transactions’ of foreign branches in each city are not available. The only readily available data is the number of branches. Nevertheless, Claessens et al. (2001) state that compared to ‘the assets of foreign bank entities’, ‘the number of foreign bank entities’ is more important as far as their impact on domestic banks is concerned. Thus, as the homogenous nature of FEI is present, it is necessary to neutralize it. This is achieved by adding interactive terms of FEI with time (t) in the model.

## 5.2 Dependent variables

Net Interest Margin (NIM) is calculated as interest income minus interest expense over total earning assets.

Cost (COST) is the overheads over total earning assets.

Non-interest Income (NII) is calculated as the other operation income over total earning assets.

Bank privatization rate: 1-share of state-owned banks

## 5.3 Explanatory

Foreign Banks Numbers (fb\_nb) is the number of foreign banks branches.

Foreign Banks asset share (fb\_as) measures the share of total asset of foreign funded banks over total banking assets.

MacroFP = the number of Chinese banks where foreign banks have invested/the total number of Chinese banks;

MicroFP = the shares held by foreign banks in a domestic bank/the total shares in a domestic bank;

## 5.4 Bank specific indicators

Equity (EQT) is measured as book value of equity over total earning assets.

Non-interest earning assets (NIA) is calculated as the cash, non-interest earning deposits at other banks, and other NIAs over total earning assets.

Customer and Short-term Funding (CSF) is measured as all short-term and long-term deposits plus other non-deposit short term funding over total earning assets.

## 5.5 Macroeconomic variables

Real GDP growth (Real GDP growth\_ct) is the real GDP growth in city i.

Openness (Openness\_ct) is the ratio of Foreign Direct Investment over GDP in city i.

# Results and discussion

The main objective of this study is to use a more accurate measure of foreign bank presence to assess the impact of foreign bank presence on domestic bank performance as well as the domestic financial liberalization. Three performance indicators namely net interest margin, noninterest income and cost are used. Financial liberalization captured by bank privatization rate, is also examined in this study and the results are presented in Table 1-4. In each table, the estimators in models 1-5 are fixed effects model estimators and the estimators in model 6-7 are Difference Generalised Methods of Moments (GMM) estimators.

There are three steps of analysis for each indicator in this study. In the first step, the baseline models are examined (models 1-4) using the aggregate measures (foreign banks numbers, foreign banks asset share, and MacroFP) as well as bank specific variables and year dummies, which are used as conventional model specification in previous studies, for example Shen et al. (2009). The second step is to examine the same model as in the first step but to replace the aggregate measures with disaggregate measure: FEI (model 5). By comparing the results from these two steps, it is possible to identify how FEI changes results while all other variables remain the same. Results of all four tables shows that the FEI has a larger coefficient and a smaller F-value compared to other measures. Thus, in models 6 and 7, the Difference GMM estimators address the endogeneity issue and the interactive terms of FEI and year dummies relax the homogeneity of FEI over the years. In this way, we test the accuracy of FEI.

## 6.1 Net Interest Margin

Table 1 reports results associated with net interest margin. The baseline model (models l-3) using the aggregate measures (foreign banks numbers, foreign banks asset share, MacroFP) finds a highly significant and positive relationship between foreign bank presence and domestic bank’s interest margin. This reproduces the results of previous studies, such as Chen and Xiao (2007), Jiao (2008), Shen et al. (2009) and Huang and Qin (2009). But there are few convincing arguments which can link the presence of foreign banks to a rising interest margin. Huang and Qin (2009) offer a limited explanation to this phenomenon. In their study, they attribute their results to the fact that in China the deposit rate and loan rate are partly controlled by the central bank. In their sample (1999-2005), control is released for several times to allow banks to gain higher margin. For example, in 2000, the central bank unified the policy on interest rate on foreign currency for domestic and foreign bank entities. On 1st January 2004, the central bank extends the highest loan rate that commercial banks can set to 1.7 times the base loan rate. And in October 2004, the restriction on the highest loan rate of commercial banks has been removed, only the lowest loan rate is restricted. This may explain why the margin is increased. But as mentioned above, their study did not provide convincing evidence which links the presence of foreign banks to the higher margin. However, in this study, the significant and positive coefficients of foreign banks number (fb\_nb) and foreign banks asset share (fb\_as) provide convincing evidence that the relationship between foreign banks presence and higher margin is significant.

However, the results of aggregate models (models 1-3), have exposed an intrinsic problem. The aggregate measures of foreign presence are annual data and vary only by year. So, it is hard to distinguish the effect of foreign presence from other regulatory effects such as interest-rate policy which may have a larger effect on interest margin than foreign bank entry.

Thus, after including FEI in model 5, results change completely. The coefficient of FEI is significantly negative which means that foreign bank presence relates to a lower margin, in other words, a more competitive and efficient domestic bank system. There is other evidence supporting this result. Although interest rates are regulated by the central bank in China, liberalization is underway and advancing rapidly. Domestic banks in China already try to make more income by adjusting their interest rates to the situation they meet in the market. People’s Bank of China (2003) has argued that financial institutions have not raised the interest rate on all loans to the upper limit even though the government is continuously widening the band that the interest rate can float. This can be the evidence that under the pressure of foreign bank entry, local banks have consciously kept their interest rate at a competitive level.

In model 4, MicroFP yields an insignificant result while MacroFP has a significant effect in model 1. Year dummies control for other policy effects including those that facilitate banks to earn more interest such as the widening band, unaccounted for by the identified macroeconomic factors. After the Vice President Xi Jinping took over control in 2012, the opening up of the banking sector has speeded up. The number of foreign bank entities has increased from 387 in 2011 to 1013 in 2017. This provides an explanation for the significance of year dummies from 2012 to 2016 and the insignificance of year dummies from 2008 to 2011. Thus, in model 5, the significant coefficient of FEI is more accurate and equal to -3.83. Difference GMM estimators in model 6 correct for endogeneity and provide significant results with the same sign. The interaction term of FEI and year dummies in model 7 accounts for variation of FEI over time. The results in model 7 suggest that the impact of FEI on domestic bank’s margin is significant after year 2012. However, the sign of ‘Customer and short-term funding’ is expected to be positive in all models because it offers a lower interest for customers compared to other deposit products, which should have a positive effect on net interest margin. But in the last model (model 7), the sign is found to be negative. This could be a result of the introduction of interactive effects between FEI and year dummies. Results for models 1 to 6 match our expectations, so our models are well specified.

In summary, there is a significantly negative relationship between foreign bank entry and domestic bank margin. This means a more open banking market is strongly associated to a more competitive one.

## 6.2 Noninterest Income

Table 2 presents results of the relationship between noninterest income and foreign presence. The baseline model (l-3) shows there is a non-significant effect of fb\_nb, fb\_ns and MacroFP on domestic bank’s noninterest income. However, when FEI is introduced, model 5 reports a significantly positive effect. This means that the enhanced measure of foreign presence suggests that foreign bank entry is associated with an increased noninterest income for domestic banks. The sign of Customer and short-term funding changed from positive in models 1-4 to negative in model 5. As illustrated in section 4, customer and short-term funding should be negatively related to the banks’ noninterest income. Therefore, the inclusion of FEI has helped to achieve more reliable results by providing a negative sign through models 5 to 7. Similar to net interest margin, the coefficient of MicroFP remains insignificant in model 4. Including year dummies (Y2008….Y2016) did not produce a different result for net interest margin. After controlling for endogeneity, the signs of ‘Equity’ and ‘Non-interest earning asset’ turn from negative in model 5 to positive in models 6 and 7. This happens because GMM neutralises the impact of endogeneity and results become more reliable. Equity and non-interest earning assets should be positively related to the non-interest income.

## 6.3 Cost

Results in Table 3 show that the coefficient of both aggregate measurements (fb\_nb, fb\_ns and MarcoFP) and FEI are significantly positive, which means that the presence of foreign banks is linked to a raise in cost of domestic banks. This is in line with Lensink and Hermes (2004) observation that costs are likely to rise following foreign entry in the short run, because domestic banks spend more to offer new services or improve the quality of existing services to defend their market share

## 6.4 Financial liberalization

Table 4 shows the estimation results of the impact of foreign bank presence on domestic financial liberalization. The baseline model 1-3 shows that fb\_nb, fb\_as and MacroFP yields an insignificant effect on financial liberalization. However, after taking FEI into account, the effect becomes significantly positive. Year dummies capture all the effects that change over time, such as regulatory reforms and other external shocks that can affect the banking system. Year dummies help to control for time-specific factors that affect bank performance. In model 6 and 7, after controlling for endogeneity, the results keep unchanged. Thus, the results show that foreign bank presence has a significant positive effect on the domestic financial market liberalization. The results provide convincing evidence to explain the rapidly liberalized financial market in China. From March 2002, the People’s Bank of China began issuing licenses to allow banks to extend foreign exchange services to domestic companies and individuals. “Citibank Shanghai received the first license for a fully owned foreign bank. Xiamen International Bank, a bank which is 25% owned by Japan’s Shinsei Bank, then Asian Development Bank and the Sino-Finance Group, won approval to provide foreign exchange services in Xiamen later. HSBC, the Bank of East Asia, Hang Seng Bank and Standard Chartered have also received licenses (Oxford Analytica 21 June 2002). PBC originally set a maximum 15% stake limit to be bought by foreign investors. HSBC was the first foreign bank to take advantage of this rule when it took an 8% stake in the Bank of Shanghai in December 2001, followed by Citibank and IFC” (Bayraktar and Wang, 2004, p19). In December 2003, the ceiling on foreign ownership in local banks was raised from 15% to 20% for single shareholders and 25% overall. After several years, steps towards opening up the bank sector to foreign banks and investors, China’s process of liberalization of financial market is speeding up (Bayraktar and Wang, 2004; Xu, 2003; Laurenceson and Qin, 2008; Mao, 2006; Podpiera, 2006; Ma, 2007).

## 6.5 City-bank sample

Table 5 presents the results from models that include the city dimension. In these models, the real GDP growth in city i and the ratio of foreign direct investment over GDP in city i are controlled. As the sample size compared to the previous models is extensively reduced, the coefficient of FEI of noninterest income, cost and bank privatization rate are no longer significant, but a significant negative coefficient is present for FEI on net interest margin. The results of net interest margin in city dimension is in line with previous results.

# Conclusion

The main objective of this study is to use an enhanced measure of foreign bank entry (FEI) to answer three policy questions: (i) whether opening up the bank sector positively influences the local banking industry; (ii) whether the percentage of shares held by foreign investors affect local bank performance; (iii) in terms of financial liberalization, whether the presence of foreign banks actually is in favour of the process. In the study, four performance indicators – net interest margin, noninterest income, costs and accounting profits – as well as the financial liberalization indicator captured by bank privatization rate – are examined.

There are mainly two advantages for using FEI as a measure of foreign bank entry. The first one, which is a direct advantage, is that it provides a more accurate measure of foreign bank presence which results in an accurate assessment of the relationship between foreign bank entry and domestic bank performance. The indirect advantage is that FEI allows researchers to include year dummies in analysis and thereby isolate the effect of foreign entry from other macroeconomic influences (Xu, 2011). Previous literature provides confusing results using aggregate measures (fb\_ns, fb\_nas and MacroFP). In this study, after using the FEI measurement, the results strongly support that foreign bank entry is positively related to a more competitive and efficient domestic banking sector in China.

There are two opposing views regarding the opening-up policy in financial markets. The first one argues that foreign bank entry is in favour of enhancing efficiency of the domestic banking sector. The other one suggests that “the inefficient domestic banking industry will ‘lose’ under intensified foreign competition and become vulnerable to foreign takeover” (Xu, 2011, p.29). The results of this study provide empirical support for the first one. This is an important policy implication of this study.

Finally, due to limited data, we can only use the number of foreign bank branches in a city to measure the influence of foreign presence. The FEI measurement is expected to be further expanded when data on foreign banks assets and information on foreign bank balance sheet are accessible at city level.

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Table 1

The effect of foreign bank presence on Chinese Banks’ net interest margin

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | GMM Method |
| 　 | 1 | 2 | 3 | 4 | 5 | 　 | 6 | 7 |
| Log Net Interest Margin |  |  |  |  |  |  | 0.302\*\* | 0.358\*\* |
|  |  |  |  |  |  |  | (0.003) | (0.007) |
| Log2 Net Interest Margin |  |  |  |  |  |  | -0.0152 | -0.0235 |
|  |  |  |  |  |  |  | (0.062) | (0.051) |
| **Bank Specific Variables** |  |
| Equity | -0.1734 | -0.1954 | -2.782\*\* | -1.6217 | -1.026 |  | -3.0528 | -3.9625 |
|  | (0.065) | (0.074) | (0.043) | (0.103) | (0.081) |  | (1.021) | (0.907) |
| Non-interest earning assets | -0.321 | -0.4952 | -0.4037 | -0.2102 | -0.284 |  | -0.982\*\* | -1.301\*\* |
|  | (0.074) | (0.071) | (0.051) | (0.671) | (0.051) |  | (0.012) | (0.009) |
| Customer and short-term funding | 0.0624 | 0.3154 | 0.2134 | 0.1982 | 0.1705 |  | 0.0400 | -0.1024 |
|  | (0.074) | (0.071) | (0.051) | (0.057) | (0.073) |  | (0.102) | (0.105) |
| Cost | 59.61\*\* | 48.97\*\* | 51.17\*\* | 59.24\*\* | 62.31\*\* |  | 22.7821 | 40.0\*\*\* |
|  | (0.004) | (0.013) | (0.011) | (0.011) | (0.005) |  | (0.056) | (0.0009) |
| **Aggregate Measures** |  |
| Macro FP | 0.018\*\* |  |  |  |  |  |  |  |
|  | (0.023) |  |  |  |  |  |  |  |
| Foreign Banks Number |  | 0.015\*\* |  |  |  |  |  |  |
|  |  | (0.014) |  |  |  |  |  |  |
| Foreign Banks Asset Share |  |  | 0.504\*\* |  |  |  |  |  |
|  |  |  | (0.005) |  |  |  |  |  |
| **Disaggregate Measures** |  |
| Micro FP |  |  |  | 0.009 |  |  |  |  |
|  |  |  |  | (0.055) |  |  |  |  |
| FEI |  |  |  |  | -3.826\*\* |  | -1.742\*\* |  |
|  |  |  |  |  | (0.007) |  | (0.003) |  |
| **Year Dummies** |  |
| FEI\*Year 2008 |  |  |  |  |  |  |  | -0.2841 |
|  |  |  |  |  |  |  |  | (0.064) |
| FEI\*Year 2009 |  |  |  |  |  |  |  | 0.0002 |
|  |  |  |  |  |  |  |  | (0.074) |
| FEI\*Year 2010 |  |  |  |  |  |  |  | 0.0014 |
|  |  |  |  |  |  |  |  | (0.065) |
| FEI\*Year 2011 |  |  |  |  |  |  |  | 0.0012 |
|  |  |  |  |  |  |  |  | (0.083) |
| FEI\*Year 2012 |  |  |  |  |  |  |  | 0.003\*\* |
|  |  |  |  |  |  |  |  | (0.041) |
| FEI\*Year 2013 |  |  |  |  |  |  |  | 0.010\*\* |
|  |  |  |  |  |  |  |  | (0.028) |
| FEI\*Year 2014 |  |  |  |  |  |  |  | 0.020\*\* |
|  |  |  |  |  |  |  |  | (0.027) |
| FEI\*Year 2015 |  |  |  |  |  |  |  | 0.022\*\* |
|  |  |  |  |  |  |  |  | (0.017) |
| FEI\*Year 2016 |  |  |  |  |  |  |  | 0.019\*\* |
|  |  |  |  |  |  |  |  | (0.011) |
| Year 2008 | 0.312 | 0.204 | 0.1785 | 0.4275 | 0.0462 |  | -1.012 | -0.0785 |
|  | (0.104) | (0.067) | (0.074) | (0.069) | (0.052) |  | (0.05) | (0.054) |
| Year 2009 | 0.0124 | 0.0173 | 0.1754 | 0.6624 | 0.0027 |  | 0.0014 | 0.0011 |
|  | (0.057) | (0.067) | (0.053) | (0.074) | (0.061) |  | (0.051) | (0.051) |
| Year 2010 | 0.2754 | 0.3012 | 0.0154 | 0.01127 | 0.0235 |  | 0.0152 | 0.0112 |
|  | (0.064) | (0.073) | (0.085) | (0.094) | (0.078) |  | (0.081) | (0.063) |
| Year 2011 | 0.1789 | 0.8527 | 1.2013 | 0.975 | 0.1275 |  | 0.0931 | 0.0202 |
|  | (0.058) | (0.082) | (0.094) | (0.065) | (0.075) |  | (0.082) | (0.063) |
| Year 2012 | 0.157\*\* | 0.174\*\* | 0.853\*\* | 0.687\*\* | 0.146\*\* |  | 0.165\*\* | 0.152\*\* |
|  | (0.003) | (0.041) | (0.038) | (0.014) | (0.038) |  | (0.0270 | (0.004) |
| Year 2013 | 0.017\*\* | 0.065\*\* | 0.075\*\* | 0.085\*\* | 0.180\*\* |  | 0.213\*\* | 0.162\*\* |
|  | (0.004) | (0.017) | (0.038) | (0.029) | (0.044) |  | (0.031) | (0.029) |
| Year 2014 | 0.205\*\* | 0.187\*\* | 0.954\*\* | 1.235\*\* | 0.425\*\* |  | 0.306\*\* | 0.299\*\* |
|  | (0.049) | (0.042) | (0.035) | (0.009) | (0.017) |  | (0.016) | (0.009) |
| Year 2015 | 0.064\*\* | 0.174\*\* | 0.363\*\* | 0.317\*\* | 0.982\*\* |  | 0.495\*\* | 0.365\*\* |
|  | (0.048) | (0.014) | (0.008) | (0.027) | (0.008) |  | (0.014) | (0.012) |
| Year 2016 | 1.095\*\* | 0.998\*\* | 0.973\*\* | 1.001\*\* | 1.132\*\* |  | 0.648\*\* | 0.491\*\* |
|  | (0.014) | (0.003) | (0.001) | (0.007) | (0.005) |  | (0.015) | (0.037) |
| \_cons | -0.892\*\* | -1.10\*\* | -1.99\*\* | -1.03\*\* | 1.954\*\* |  | 2.018\*\* | 2.11.\*\* |
|  | (0.042) | (0.007) | (0.004) | (0.025) | (0.039) |  | (0.017) | (0.029) |
| N | 379 | 379 | 379 | 379 | 379 | N | 140 | 140 |
| R squared | 0.192 | 0.144 | 0.209 | 0.312 | 0.164 | M2 | 0.6871 | 0.8512 |
| F | 4.4898 | 3.1786 | 4.9924 | 8.5685 | 3.7066 | Sargan | 120.82 | 119.41 |

Note: (1) Models 1-5 use equation 1 and models 6-7 use equation 2. (2) p-values in parentheses, \*\* Significance level at 0.05, \*\*\*Significance level at 0.001

Table 2

The effect of foreign bank presence on Chinese Banks’ non-interest income

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | GMM Method |
| 　 | 1 | 2 | 3 | 4 | 5 | 　 | 6 | 7 |
| Log Non-interest Income |  |  |  |  |  |  | 0.2064\*\* | 0.2101\*\* |
|  |  |  |  |  |  |  | (0.006) | (0.003) |
| Log2 Non-interest Income |  |  |  |  |  |  | -0.0874 | -0.103 |
|  |  |  |  |  |  |  | (0.081) | (0.097) |
| **Bank Specific Variables** |  |  |  |  |  |  |  |  |
| Equity | 0.0001 | 0.0092 | 0.0101 | 0.0001 | -0.0203 |  | 0.0012 | 0.0004 |
|  | (0.058) | (0.096) | (0.054) | (0.072) | (0.070) |  | (0.097) | (0.091) |
| Non-interest earning assets | 0.051 | 0.0184 | 0.2151 | 0.1987 | -0.0028 |  | 0.0032\*\* | 0.0041\*\* |
|  | (0.069) | (0.064) | (0.057) | (0.077) | (0.104) |  | (0.047) | (0.035) |
| Customer and short-term funding | 0.024 | 0.0974 | 0.1345 | 0.0074 | -0.0012 |  | -0.014 | -0.002 |
|  | (0.051) | (0.097) | (0.065) | (0.071) | (0.075) |  | (0.064) | (0.092) |
| Cost | 0.537\*\* | 0.499\*\* | 0.604\*\* | 0.553\*\* | 0.465\*\* |  | 0.3617 | 0.2142\*\* |
|  | (0.007) | (0.021) | (0.027) | (0.014) | (0.042) |  | (0.051) | (0.007) |
| **Aggregate Measures** |  |  |  |  |  |  |  |  |
| Macro FP | 0.003\*\* |  |  |  |  |  |  |  |
|  | (0.014) |  |  |  |  |  |  |  |
| Foreign Banks Number |  | 0.001\*\* |  |  |  |  |  |  |
|  |  | (0.001) |  |  |  |  |  |  |
| Foreign Banks Asset Share |  |  | 0.004\*\* |  |  |  |  |  |
|  |  |  | (0.005) |  |  |  |  |  |
| **Disaggregate Measures** |  |  |  |  |  |  |  |  |
| Micro FP |  |  |  | 0.194 |  |  |  |  |
|  |  |  |  | (0.052) |  |  |  |  |
| FEI |  |  |  |  | 0.01\*\*\* |  | 0.0145\*\* |  |
|  |  |  |  |  | (0.000) |  | (0.007) |  |
| **Year Dummies** |  |  |  |  |  |  |  |  |
| FEI\*Year 2008 |  |  |  |  |  |  |  | 0.0014 |
|  |  |  |  |  |  |  |  | (0.059) |
| FEI\*Year 2009 |  |  |  |  |  |  |  | 0.0025 |
|  |  |  |  |  |  |  |  | (0.073) |
| FEI\*Year 2010 |  |  |  |  |  |  |  | 0.0043 |
|  |  |  |  |  |  |  |  | (0.082) |
| FEI\*Year 2011 |  |  |  |  |  |  |  | 0.0078 |
|  |  |  |  |  |  |  |  | (0.091) |
| FEI\*Year 2012 |  |  |  |  |  |  |  | 0.01\*\* |
|  |  |  |  |  |  |  |  | (0.003) |
| FEI\*Year 2013 |  |  |  |  |  |  |  | 0.01\*\* |
|  |  |  |  |  |  |  |  | (0.001) |
| FEI\*Year 2014 |  |  |  |  |  |  |  | 0.02\*\* |
|  |  |  |  |  |  |  |  | (0.007) |
| FEI\*Year 2015 |  |  |  |  |  |  |  | 0.03\*\* |
|  |  |  |  |  |  |  |  | (0.024) |
| FEI\*Year 2016 |  |  |  |  |  |  |  | 0.0\*\* |
|  |  |  |  |  |  |  |  | (0.041) |
| Year 2008 | -0.012 | -0.0081 | -0.0143 | -0.003 | -0.0002 |  | -0.0011 | -0.001 |
|  | (0.084) | (0.064) | (0.057) | (0.055) | (0.072) |  | (0.068) | (0.097) |
| Year 2009 | -0.004 | -0.0034 | -0.0012 | -0.0107 | -0.0003 |  | -0.0007 | -0.001 |
|  | (0.075) | (0.062) | (0.059) | (0.067) | (0.14) |  | (0.103) | (0.097) |
| Year 2010 | -0.001 | -0.041 | -0.095 | -0.084 | -0.0012 |  | -0.0002 | -0.003 |
|  | (0.063) | (0.079) | (0.071) | (0.053) | (0.082) |  | (0.092) | (0.097) |
| Year 2011 | -0.006 | 0.0012 | 0.001 | -0.0001 | -0.0014 |  | 0.0001 | -0.003 |
|  | (0.053) | (0.062) | (0.055) | (0.061) | (0.079) |  | (0.088) | (0.102) |
| Year 2012 | -0.00\*\* | -0.00\*\* | -0.00\*\* | -0.10\*\* | -0.01\*\* |  | -0.000\*\* | -0.00\*\* |
|  | (0.001) | (0.017) | (0.012) | (0.032) | (0.009) |  | (0.021) | (0.025) |
| Year 2013 | -0.01\*\* | -0.00\*\* | -0.00\*\* | -0.01\*\* | -0.00\*\* |  | -0.004\*\* | 0.01\*\* |
|  | (0.008) | (0.031) | (0.049) | (0.026) | (0.033) |  | (0.041) | (0.015) |
| Year 2014 | -0.01\*\* | -0.01\*\* | -0.00\*\* | -0.00\*\* | -0.00\*\* |  | -0.001\*\* | -0.00\*\* |
|  | (0.007) | (0.014) | (0.037) | (0.004) | (0.007) |  | (0.004) | (0.048) |
| Year 2015 | -0.01\*\* | -0.05\*\* | -0.00\*\* | -0.00\*\* | -0.01\*\* |  | -0.001\*\* | -0.00\*\* |
|  | (0.004) | (0.049) | (0.041) | (0.032) | (0.006) |  | (0.017) | (0.035) |
| Year 2016 | -0.01\*\* | -0.00\*\* | -0.00\*\* | -0.00\*\* | -0.01\*\* |  | -0.003\*\* | -0.01\*\* |
|  | (0.001) | (0.017) | (0.004) | (0.028) | (0.046) |  | (0.007) | (0.008) |
| \_cons | 0.012\*\* | 0.030\*\* | 0.029\*\* | 0.103\*\* | 0.01\*\* |  | 2.0178\*\* | 2.11\*\* |
|  | (0.041) | (0.005) | (0.001) | (0.021) | (0.027) |  | (0.018) | (0.027) |
| N | 382 | 382 | 382 | 382 | 382 | N | 140 | 140 |
| R squared | 0.221 | 0.2245 | 0.2012 | 0.2134 | 0.138 | M2 | 0.7015 | 0.6618 |
| F | 5.3603 | 5.5155 | 4.7989 | 5.1689 | 3.0249 | Sargan | 122.64 | 111.28 |

Note: (1) Models 1-5 use equation 1 and models 6-7 use equation 2. (2) p-values in parentheses, \*\* Significance level at 0.05, \*\*\*Significance level at 0.001

Table 3

The effect of foreign bank presence on Chinese Banks’ cost

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | GMM Method |
| 　 | 1 | 2 | 3 | 4 | 5 | 　 | 6 | 7 |
| Log Cost |  |  |  |  |  |  | 0.2001\*\* | 0.2357\*\* |
|  |  |  |  |  |  |  | (0.003) | (0.009) |
| Log2 Cost |  |  |  |  |  |  | 0.0358 | 0.0004 |
|  |  |  |  |  |  |  | (0.052) | (0.067) |
| **Bank Specific Variables** |  |
| Equity | 0.215\*\* | 0.085\*\* | 0.044\*\* | 0.031\*\* | 0.027\*\* |  | 0.0185\*\* | 0.0201\*\* |
|  | (0.006) | (0.002) | (0.014) | (0.012) | (0.178) |  | (0.026) | (0.002) |
| Non-interest earning assets | -0.0024 | -0.0028 | -0.0031 | -0.0034 | -0.002 |  | -0.001 | -0.002 |
|  | (0.083) | (0.072) | (0.067) | (0.055) | (0.059) |  | (0.0051) | (0.054) |
| Customer and short-term funding | 0.008 | 0.0099 | 0.0054 | 0.0081 | 0.0049 |  | 0.0099 | 0.011\*\*\* |
|  | (0.053) | (0.054) | (0.087) | (0.079) | (0.051) |  | (0.063) | (0.0009) |
| **Aggregate Measures** |  |  |  |  |  |  |  |  |
| Macro FP | 0.006\*\* |  |  |  |  |  |  |  |
|  | (0.003) |  |  |  |  |  |  |  |
| Foreign Banks Number |  | 0.0001 |  |  |  |  |  |  |
|  |  | (0.082) |  |  |  |  |  |  |
| Foreign Banks Asset Share |  |  | 0.002\*\* |  |  |  |  |  |
|  |  |  | (0.007) |  |  |  |  |  |
| **Disaggregate Measures** |  |  |  |  |  |  |  |  |
| Micro FP |  |  |  | 0.006\*\* |  |  |  |  |
|  |  |  |  | (0.003) |  |  |  |  |
| FEI |  |  |  |  | 0.0001 |  | 0.0052\*\* |  |
|  |  |  |  |  | (0.082) |  | (0.008) |  |
| **Year Dummies** |  |  |  |  |  |  |  |  |
| FEI\*Year 2008 |  |  |  |  |  |  |  | 0.0014 |
|  |  |  |  |  |  |  |  | (0.124) |
| FEI\*Year 2009 |  |  |  |  |  |  |  | 0.0022 |
|  |  |  |  |  |  |  |  | (0.093) |
| FEI\*Year 2010 |  |  |  |  |  |  |  | 0.0023 |
|  |  |  |  |  |  |  |  | (0.085) |
| FEI\*Year 2011 |  |  |  |  |  |  |  | 0.0032 |
|  |  |  |  |  |  |  |  | (0.097) |
| FEI\*Year 2012 |  |  |  |  |  |  |  | 0.0041\*\* |
|  |  |  |  |  |  |  |  | (0.003) |
| FEI\*Year 2013 |  |  |  |  |  |  |  | 0.0057\*\* |
|  |  |  |  |  |  |  |  | (0.007) |
| FEI\*Year 2014 |  |  |  |  |  |  |  | 0.0061\*\* |
|  |  |  |  |  |  |  |  | (0.003) |
| FEI\*Year 2015 |  |  |  |  |  |  |  | 0.0077\*\* |
|  |  |  |  |  |  |  |  | (0.009) |
| FEI\*Year 2016 |  |  |  |  |  |  |  | 0.0095\*\* |
|  |  |  |  |  |  |  |  | (0.024) |
| Year 2008 | 0.001 | 0.0014 | 0.0041 | 0.0015 | 0.0021 |  | 0.0008 | 0.0012 |
|  | (0.062) | (0.051) | (0.059) | (0.065) | (0.087) |  | (0.074) | (0.084) |
| Year 2009 | 0.0014 | 0.0054 | 0.0021 | 0.0035 | 0.0012 |  | 0.0002 | 0.0001 |
|  | (0.054) | (0.052) | (0.095) | (0.084) | (0.041) |  | (0.054) | (0.095) |
| Year 2010 | 0.001 | 0.0042 | 0.0021 | 0.0015 | -0.002 |  | 0.0002 | 0.003 |
|  | (0.051) | (0.062) | (0.052) | (0.056) | (0.001) |  | (0.052) | (0.067) |
| Year 2011 | -0.001 | -0.005 | -0.004 | -0.004 | -0.003 |  | -0.000 | 0.0041 |
|  | (0.054) | (0.067) | (0.061) | (0.072) | (0.071) |  | (0.057) | (0.095) |
| Year 2012 | -0.01\*\* | -0.01\*\* | -0.00\*\* | -0.00\*\* | -0.00\*\* |  | -0.002\*\* | -0.001\*\* |
|  | (0.014) | (0.009) | (0.005) | (0.029) | (0.027) |  | (0.041) | (0.006) |
| Year 2013 | -0.00\*\* | -0.00\*\* | -0.01\*\* | -0.01\*\* | -0.01\*\* |  | -0.001\*\* | -0.003\*\* |
|  | (0.005) | (0.001) | (0.007) | (0.011) | (0.029) |  | (0.001) | (0.017) |
| Year 2014 | -0.01\*\* | -0.01\*\* | -0.00\*\* | -0.01\*\* | -0.01\*\* |  | -0.002\*\* | -0.001\*\* |
|  | (0.049) | (0.041) | (0.039) | (0.035) | (0.028) |  | (0.009) | (0.016) |
| Year 2015 | -0.00\*\* | -0.00\*\* | -0.00\*\* | -0.00\*\* | -0.01\*\* |  | -0.002\*\* | -0.000\*\* |
|  | (0.015) | (0.019) | (0.024) | (0.035) | (0.038) |  | (0.027) | (0.018) |
| Year 2016 | -0.01\*\* | -0.01\*\* | -0.01\*\* | -0.01\*\* | -0.01\*\* |  | -0.002\*\* | -0.000\*\* |
|  | (0.014) | (0.025) | (0.014) | (0.011) | (0.007) |  | (0.003) | (0.045) |
| \_cons | 0.413\*\* | 0.016\*\* | 0.009\*\* | 0.018\*\* | 0.003\*\* |  | 2.0178\*\* | 2.1128\*\* |
|  | (0.034) | (0.009) | (0.011) | (0.044) | (0.029) |  | (0.001) | (0.003) |
| N | 382 | 382 | 382 | 382 | 382 | N | 140 | 140 |
| R squared | 0.207 | 0.215 | 0.301 | 0.194 | 0.199 | M2 | 0.6214 | 0.3652 |
| F | 5.0007 | 5.2182 | 8.2044 | 4.5859 | 4.7334 | Sargan | 101.24 | 100.95 |

Note: (1) Models 1-5 use equation 1 and models 6-7 use equation 2. (2) p-values in parentheses, \*\* Significance level at 0.05, \*\*\*Significance level at 0.001

Table 4

The effect of foreign bank presence on bank privatization rate

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | GMM Method |
|  | 1 | 2 | 3 | 4 | 5 |  | 6 | 7 |
| Log Privatization Rate |  |  |  |  |  |  | 0.0128\*\* | 0.0265\*\* |
|  |  |  |  |  |  |  | (0.003) | (0.019) |
| Log2 Privatization Rate |  |  |  |  |  |  | 0.0015 | 0.0004 |
|  |  |  |  |  |  |  | (0.052) | (0.067) |
| **Bank Specific Variables** |  |  |  |  |  |  |  |  |
| Equity | 0.0014 | 0.0021 | 0.0027 | 0.0243 | 0.0025 |  | 0.0221 | 0.0018 |
|  | (0.085) | (0.064) | (0.075) | (0.066) | (0.082) |  | (0.085) | (0.079) |
| Non-interest earning assets | 0.0027 | 0.0029 | 0.0123 | 0.0019\*\* | 0.0036 |  | 0.0008 | 0.0014 |
|  | (0.059) | (0.108) | (0.093) | (0.038) | (0.088) |  | (0.201) | (0.13) |
| Customer and short-term funding | 0.0012\*\* | 0.0045\*\* | 0.0014\*\* | 0.0039\*\* | 0.0011\*\* |  | 0.0001 | 0.0005 |
|  | (0.025) | (0.016) | (0.017) | (0.008) | (0.058) |  | (0.062) | (0.063) |
| Cost | 0.1405\*\* | 0.1924\*\* | 0.1352\*\* | 0.2142 | 0.2236 |  | 0.0752\*\* | 0.1124\*\* |
|  | (0.028) | (0.014) | (0.011) | (0.068) | (0.078) |  | (0.215) | (0.302) |
| **Aggregate Measures** |  |  |  |  |  |  |  |  |
| Macro FP | 0.0014 |  |  |  |  |  |  |  |
|  | (0.099) |  |  |  |  |  |  |  |
| Foreign Banks Number |  | 0.0008\*\* |  |  |  |  |  |  |
|  |  | (0.08) |  |  |  |  |  |  |
| Foreign Banks Asset Share |  |  | 0.0028 |  |  |  |  |  |
|  |  |  | (0.071) |  |  |  |  |  |
| **Disaggregate Measures** |  |  |  |  |  |  |  |  |
| Micro FP |  |  |  | 0.00001 |  |  |  |  |
|  |  |  |  | (0.081) |  |  |  |  |
| FEI |  |  |  |  | 0.0254\*\* |  | 0.0072\*\* |  |
|  |  |  |  |  | (0.001) |  | (0.006) |  |
| **Year Dummies** |  |  |  |  |  |  |  |  |
| FEI\*Year 2008 |  |  |  |  |  |  |  | 0.0011 |
|  |  |  |  |  |  |  |  | (0.062) |
| FEI\*Year 2009 |  |  |  |  |  |  |  | 0.0012 |
|  |  |  |  |  |  |  |  | (0.074) |
| FEI\*Year 2010 |  |  |  |  |  |  |  | 0.0185 |
|  |  |  |  |  |  |  |  | (0.078) |
| FEI\*Year 2011 |  |  |  |  |  |  |  | 0.019 |
|  |  |  |  |  |  |  |  | (0.077) |
| FEI\*Year 2012 |  |  |  |  |  |  |  | 0.0024\*\* |
|  |  |  |  |  |  |  |  | (0.012) |
| FEI\*Year 2013 |  |  |  |  |  |  |  | 0.0032\*\* |
|  |  |  |  |  |  |  |  | (0.039) |
| FEI\*Year 2014 |  |  |  |  |  |  |  | 0.0033\*\* |
|  |  |  |  |  |  |  |  | (0.044) |
| FEI\*Year 2015 |  |  |  |  |  |  |  | 0.0048\*\* |
|  |  |  |  |  |  |  |  | (0.035) |
| FEI\*Year 2016 |  |  |  |  |  |  |  | 0.0061\*\* |
|  |  |  |  |  |  |  |  | (0.018) |
| Year 2008 | 0.0015 | 0.0005 | 0.0009 | 0.0012 | 0.0024 |  | 0.0001 | 0.0000 |
|  | (0.051) | (0.064) | (0.097) | (0.099) | (0.072) |  | (0.085) | (0.093) |
| Year 2009 | 0.0014 | 0.0015 | 0.0031 | 0.001 | 0.0023 |  | 0.0007 | 0.0001 |
|  | (0.062) | (0.072) | (0.084) | (0.081) | (0.073) |  | (0.097) | (0.061) |
| Year 2010 | 0.001 | 0.003 | 0.0003 | 0.0001 | 0.0019 |  | 0.0002 | 0.0002 |
|  | (0.055) | (0.063) | (0.074) | (0.057) | (0.003) |  | (0.07)2 | (0.083) |
| Year 2011 | 0.0001 | 0.0013 | 0.0002 | 0.0004 | 0.0025 |  | 0.0003 | 0.0002 |
|  | (0.054) | (0.066) | (0.059) | (0.0501) | (0.031) |  | (0.072) | (0.068) |
| Year 2012 | 0.0005\*\* | 0.0011\*\* | 0.0009\*\* | 0.0014\*\* | 0.0031\*\* |  | 0.0012\*\* | 0.0009\*\* |
|  | (0.003) | (0.048) | (0.041) | (0.038) | (0.003) |  | (0.029) | (0.049) |
| Year 2013 | 0.0015\*\* | 0.0001\*\* | 0.0017\*\* | 0.0024\*\* | 0.0044\*\* |  | 0.0021\*\* | 0.0011\*\* |
|  | (0.015) | (0.035) | (0.041) | (0.048) | (0.018) |  | (0.009) | (0.005) |
| Year 2014 | 0.0015\*\* | 0.0024\*\* | 0.0038\*\* | 0.0049\*\* | 0.0046\*\* |  | 0.0035\*\* | 0.001\*\* |
|  | (0.001) | (0.042) | (0.037) | (0.024) | (0.008) |  | (0.007) | (0.034) |
| Year 2015 | 0.0041\*\* | 0.0024\*\* | 0.0019\*\* | 0.0049\*\* | 0.005\*\* |  | 0.0044\*\* | 0.0024\*\* |
|  | (0.015) | (0.042) | (0.047) | (0.031) | (0.025) |  | (0.017) | (0.048) |
| Year 2016 | 0.0014\*\* | 0.0041\*\* | 0.0051\*\* | 0.0035\*\* | 0.0053\*\* |  | 0.0045\*\* | 0.0023\*\* |
|  | (0.012) | (0.036) | (0.031) | (0.018) | (0.052) |  | (0.019) | (0.021) |
| \_cons | 1.1248\*\* | 0.9054\*\* | 0.9971\*\* | 1.0012\*\* | 0.0022\*\* |  | 2.0178\*\* | 2.1128\*\* |
|  | (0.041) | (0.023) | (0.001) | (0.022) | (0.018) |  | (0.003) | (0.009) |
| N | 382 | 382 | 382 | 382 | 382 | N | 140 | 140 |
| R squared | 0.205 | 0.213 | 0.231 | 0.211 | 0.207 | M2 | 0.5742 | 0.2981 |
| F | 4.9129 | 5.1564 | 5.7232 | 5.0951 | 4.9733 | Sargan | 112.47 | 101.27 |

Note: (1) Models 1-5 use equation 1 and models 6-7 use equation 2. (2) p-values in parentheses, \*\* Significance level at 0.05, \*\*\*Significance level at 0.001

Table 5

The city bank sample

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Net Interest Margin | Noninterest Income | Cost | Bank Privatization Rate |
|  | 1 | 2 | 3 | 4 |
| Log Equity | 2.9251 | -0.0152 | 0.0113 | 0.0245 |
|  | (0.057) | (0.053) | (0.062) | (0.079) |
| Log non-interest Earning Asset | 0.1348 | -0.0014 | 0.0022 | 0.0007 |
|  | (0.078) | (0.063) | (0.055) | (0.152) |
| Log Customer and Short-term Funding | -0.6257 | 0.0024 | 0.0039 | 0.0003 |
|  | (0.076) | (0.162) | (0.063) | (0.251) |
| Log Cost | 36.1412 | 0.0174 |  | 0.0011 |
|  | (0.081) | (0.096) |  | (0.099) |
| Real GDP Growth\_ct | 6.9087\*\* | -0.01982\*\* | -0.0029\*\* | 0.0009\*\* |
|  | (0.003) | (0.002) | (0.007) | (0.003) |
| Openness\_ct | 0.5021 | -0.0016\*\* | -0.0017 | 0.0002 |
|  | (0.072) | (0.185) | (0.067) | (0.057) |
| FEI | -2.1457\*\* | 0.0058 | 0.0017 | 0.0016 |
|  | (0.001) | (0.050) | (0.053) | (0.051) |
| \_cons | 0.9659 | 0.0087 | 0.0042 | 0.0037 |
|  | (0.067) | (0.076) | (0.083) | (0.092) |
| N | 132 | 132 | 140 | 132 |
| R Square | 0.213 | 0.3017 | 0.300 | 0.241 |
| F | 4.1612 | 6.6428 | 7.0179 | 4.8819 |

Note: (1) In this table we use equation 3. (2) p-values in parentheses, \*\* Significance level at 0.05, \*\*\*Significance level at 0.001

1. Financial liberalization is a process where the control of financial institutions is released from the central government. As a result, financial institutions are more market-driven rather than government-driven. (Yi and Ding, 2007). [↑](#footnote-ref-1)
2. Demand deposits are checking accounts. With proper ID you can go to the bank it’s drawn on and “demand” that they cash it immediately. Fixed deposits are deposits which are kept for a specific period and have got a maturity date. [↑](#footnote-ref-2)