How Does Financial Opening Affect Industrial Efficiency? The Case of Foreign Bank Entry in the People’s Republic of China

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This paper analyzes the effects of foreign bank entry on industrial efficiency in the People’s Republic of China (PRC) as a case study of financial opening. The study reveals an overall positive impact on the industry. However, the effects vary across ownership groups: negative for state and collective sectors, positive for private enterprises, and insignificant for foreign-invested firms. These findings are incompatible with predictions based on the “cream-skimming effect” and information asymmetry. We investigate two transmission channels of the policy effects—via an easing of financing constraints and through increased competition. Foreign bank entry, like financial liberalization, reverses the effects of repressive financial policy, which protects the state sector but discriminates against private enterprises. While enhancing bank competition can be an effective way to support private sector development, the state sector deserves close attention in order to ensure a smooth transition. This case study should offer some useful lessons for future financial opening.

Keywords: foreign bank entry, financial repression, industrial productivity, People’s Republic of China

JEL codes: F36, G21

I. Introduction

In late 2013, authorities of the People’s Republic of China (PRC) announced a comprehensive reform program with a strong component of financial reform focusing on reducing entry barriers, liberalizing interest and exchange rates, and achieving capital account convertibility. This could be the PRC’s last battles for financial reform, which according to plan should make critical progress by 2020 (Huang, Li, and Wang 2014).

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However, important disagreements remain among scholars and officials about the desired extent, pace, and sequence of reform because of the different assessments of the likely consequences of such reform. Liberalization of the capital account, for instance, could improve the efficiency of financial intermediation as well as increase the volatility of capital flows. Realization of capital account convertibility meanwhile could result in either a more resilient financial system, such as in Chile in the 2000s, or a devastating financial crisis, such as in Indonesia in the 1990s. Understanding the mechanisms by which financial liberalization affects the economy and the financial system is critical for making informed policy decisions.

In this paper, we analyze the effects of foreign bank entry on domestic industrial efficiency as a case study.² Many foreign banks entered the PRC during the early years of economic reform, and by the end of the last century, more than 100 foreign banks had established branches or representative offices in the country. At the time, however, they were not allowed to conduct local-currency business with local firms. As part of its commitment to join the World Trade Organization (WTO), the Chinese government agreed to remove that restriction in a number of cities every year during the first 4 years after accession and then in the entire country afterwards. This paced entry of foreign banks provides a unique policy experiment for analyzing the effects of financial opening on the domestic economy. It is worth noting that the term “foreign bank entry” in this study refers to foreign banks being allowed to do local-currency business with domestic firms.

The literature offers various predictions on this subject. Conventional theory suggests that inefficient domestic banks and lack of competition among lenders often result in high borrowing costs and limited financial access in many developing countries. Therefore, introducing foreign banks may enhance bank competition, increase credit supply, and improve economic efficiency. However, banking theory incorporating information asymmetry also demonstrates that greater competition among banks may actually reduce some firms’ access to credit (Petersen and Rajan 1995). High information costs may also induce foreign banks to lend only to the most profitable local firms (Dell’Ariccia and Marquez 2004, Sengupta 2007), which may adversely affect both domestic banks and the firms that rely upon them (Detragiache, Tressel, and Gupta 2008).

In a study on foreign bank entry in the PRC, Bonin and Huang (2001) made two predictions based on experiences of some European transitional economies. First, it is unlikely that foreign banks would overwhelm the domestic banking system unless they are allowed to take over major local banks. Rather than worrying about foreign banks destroying the domestic banking system, greater attention should be paid to potential hurdles to foreign banks’ business development. Second, because

²In another study, Huang and Ji (2014) attempted to draw macroeconomic and financial implications for the PRC by analyzing experiences of financial liberalization in about 60 middle-income economies during the past 4 decades.
of their information disadvantage but more advanced banking products, technology and networks, foreign banks would probably focus on doing business with profitable companies and wealthy households, i.e., the so-called “cream-skimming effect.”

Did foreign bank entry, represented by the opening of local-currency business with local firms, help improve industrial efficiency in the PRC? Did it benefit the large and profitable state-owned enterprises (SOEs) disproportionately due to cream skimming? Did it hurt smaller privately owned enterprises (POEs) due to their information disadvantage? What were the possible channels for the above policy effects, if they did exist? This study attempts to address these research questions by using very large datasets of industrial firms over the period 2002–2007 collected by the National Bureau of Statistics (NBS) and by applying difference-in-differences (DID) analysis.

Findings of this study provide some new insights on financial liberalization in the PRC. Foreign bank entry had significant positive effects on industrial efficiency at the aggregate level, which is in line with prior expectations. However, it had significant negative effects on SOEs and collective-owned enterprises (COEs), an insignificant impact on foreign-invested enterprises (FIEs), and a significant positive effect on POEs. The finding that foreign banks benefit POEs but hurt SOEs is actually at variance with our intuitive predictions, as foreign banks deal mostly with large SOEs and FIEs. Further investigation of the channels of policy effects confirm that foreign bank entry eases funding constraints and improves competition. Therefore, it may be regarded as an important step towards financial liberalization, reversing the effects of previous repressive financial policies that favored SOEs and COEs.

This study has important implications for both the literature and policymaking. First, our analysis suggests that in addition to the cream-skimming effect and the impact of information asymmetry problems, foreign bank entry also has an important “financial liberalization effect” as evidenced by the different outcomes for different ownership groups. Second, increasing bank competition could be as important as establishing privately owned financial institutions in improving funding conditions for the private sector, since foreign bank entry asserts the greatest benefit on the private sector. Third, foreign bank entry also causes setbacks among SOEs and COEs which were previously protected by policy, a finding that supports the case for gradual liberalization wherever possible to ensure smooth transition. Finally, given foreign banks’ positive contribution to overall efficiency, there is basis for authorities to consider reducing explicit and implicit restrictions imposed on these institutions, which currently account for a tiny share of the PRC’s banking assets.

II. Institutional Background

Prior to reform, the PRC had a single financial system. The People’s Bank of China (PBC) acted both as a commercial bank and a central bank. At the start of
the economic reform, authorities began to establish various specialized commercial banks. Today, the PRC already has a large financial system dominated by banks (Huang et al. 2013). Therefore, reform of the banking sector is critical for improving overall financial intermediation (Berger, Hasan, and Zhou 2009).

The government started the process of overhauling the banking system after the East Asian financial crisis when non-performing loan (NPL) ratios of domestic banks likely reached 30%–40% (Bonin and Huang 2001). Many of the commercial banks went through the reform process of writing off NPLs, injecting capital, introducing foreign strategic investors, and listing in the capital markets.

Despite all these reforms, the PRC’s financial policies remained heavily repressive, with heavily regulated interest rates, state-influenced credit allocation, frequently adjusted reserve requirements, and a tightly controlled capital account (Huang and Wang 2011; Huang, Gou, and Wang 2014). A comprehensive dataset provided by Abiad, Detragiache, and Tressel (2010) suggests that the index of financial liberalization for the PRC was 0.35 in 2001, the year of WTO entry. This number is quite low compared to the average for advanced economies, 0.93, or the average for emerging economies (excluding the PRC), 0.67.

This paper focuses on the narrow phenomenon of financial opening in the PRC following WTO entry. Before 2001, there were already a certain number of foreign bank branches operating in different cities. These branches, however, were only allowed to conduct foreign-currency business with foreign companies and foreign residents. Some foreign banks actually came to the PRC following companies from their home countries that were making direct investments in the country. These banks had very limited business scope. After 1993, the PRC’s government gradually lifted geographic restrictions and allowed foreign banks to conduct local-currency business with foreign firms and citizens. Meanwhile, foreign banks were also gradually allowed to conduct foreign currency business with domestic firms (Bonin and Huang 2002).

While finalizing the WTO entry agreement, the Chinese government made a strong commitment to gradually phase out restrictions on foreign banks’ local-currency business with local firms, starting with 13 cities (regions) at the end of 2003. The authorities added another five cities to the list at the end of 2004 and seven more cities at the end of 2005. Restrictions on the geographic distribution and clientele of foreign banks’ local-currency business were completely lifted by the end of 2006. Beginning 2007, foreign banks were allowed to conduct local-currency business with local firms across the entire country.

III. Literature and Hypotheses

The gradual opening up to foreign banks provides a rare opportunity for researchers to analyze the impact of financial opening, although the overall extent of openness remains quite limited. We raise three research questions:
(i) Did foreign bank entry enhance the overall efficiency of Chinese industry?
(ii) Did the effects on industrial efficiency differ across groups of firms with different ownership types?
(iii) What were the possible channels through which the policy worked?

Analysis of these questions is important for both academic and policy purposes. They not only help achieve better understanding of foreign banks’ impact on the Chinese economy but also provide useful lessons with valuable implications for future policy decisions.

The above research questions are related to at least three branches of the economic literature. The first branch examines the spillover effects of foreign direct investment (FDI) (e.g., Hymer 1960, Caves 1974, Dunning 1980 and 1983). Blomström and Kokko (1998) found that in order to overcome the disadvantages that came with operating overseas, such as cultural and language barriers and established local business practices, multinational corporations must possess some firm-specific advantages, including superior production technologies and advanced management skills. They argued that the operation of such multinational corporations can generate productivity spillovers for the local industry through channels such as demonstration, personnel training, and competition.

Some studies applied this spillover argument to the financial sector. For instance, Levine (1996) suggested two possible channels by which FDI can positively affect the domestic banking sector: the first is by directly bringing in new and better skills, management techniques, training procedures, technology, and products to the domestic market; the second is by indirectly stimulating competition in domestic financial markets, which in turn puts pressure on profits and overhead expenses, enhancing domestic banking efficiency. In our study, we will look at the spillover effects of competition in the banking sector when trying to explain changes in industrial efficiency.

The second branch of the literature directly concerns foreign bank entry as a special case of FDI, which can exert influence on domestic firms from both direct and indirect channels. That is, foreign banks may directly provide services to local firms, and they may also indirectly affect firms by changing the domestic banking sector. The latter includes increasing competition in the banking sector and improving local banks’ operating efficiency.

Some empirical studies focused on the interest rate spread, cost base, and competition in the banking sector. By analyzing bank-level data from 80 countries, Claessens, Demirgüç-Kunt, and Huizinga (2001) found that foreign bank entry lowered the interest rate spread and management costs of local banks. Several other studies reached very similar conclusions: Unite and Sullivan (2003) for the Philippine case; Clarke et al. (1999) for the Argentine case; and Barajas, Steiner, and Salazar (2000) for the Columbian case. In the meantime, Petersen and Rajan (1995) argued that banking development is critical for alleviating financing constraints.
Shen et al. (2009) pointed out that competition among banks is important for private firms obtaining loans.

Several papers dealt with the direct effect of foreign bank entry on firms. Some confirmed the cream-skimming effect, where foreign banks compete mainly with domestic banks for profitable and wealthy clients. Giannetti and Ongena (2009) found that foreign bank entry was beneficial for capital allocation in Eastern Europe, particularly for younger and larger firms. Sarma and Prashad (2013) provide evidence of the cream-skimming effect in India, arguing that foreign banks actually reduced the possibility of smaller firms from obtaining bank loans.

The third branch of the literature analyzes foreign bank entry in the PRC as a vital component of financial liberalization. Leung and Chan (2006) found that local banks actually improved efficiency in response to foreign bank entry. Berger, Hasan, and Zhou (2009) concluded that foreign capital significantly helped four big state-owned banks improve efficiency. Xu (2011) confirmed the positive effect of the existence of foreign banks on domestic bank competition and efficiency. Mao, Wu, and Liu (2010) estimated the quadratic relationship between credit provided by foreign banks and total credit in the PRC.

A more relevant study to our current research is by Lin (2011) who analyzed the data on listed companies on the Shanghai or Shenzhen stock exchanges during 2001–2005 and found that the more profitable firms and non-SOEs actually benefited more from foreign bank entry in the PRC. Lin’s study, however, suffers from some obvious shortcomings. First, private firms listed on stock exchanges are mostly large and profitable and less representative of average POEs. Second, listed POEs are not subject to the usual problem of lack of credit information given the regulatory requirements of the stock exchanges. Third, until recently, the overall share of foreign banks remains very small. This raises questions about foreign banks’ overall role in providing so-called non-discriminating loans.

Our study focuses on both aggregate effects and the more specific effects for different ownership groups—SOEs, COEs, FIEs, and POEs. Based on the literature review outlined above, we formulate three tentative hypotheses for empirical tests. One is that foreign bank entry should be beneficial for the Chinese industry as a whole, as it probably intensified competition and increased credit supply. However, since foreign banks’ share in the total banking sector did not increase after the PRC’s WTO entry, we focus on the competition effect in this study. Another is that foreign bank entry would benefit large and profitable firms, including many of the SOEs and FIEs, by a greater degree due to the cream-skimming effect. Finally, foreign bank entry could further put the smaller firms at a disadvantage, including many in the private sector, given information asymmetry problems. According to Levine (1996), foreign banks are at a disadvantage due to cultural and language barriers (i.e., the “soft information”) and tend to choose based on “hard information.” SOEs, which are widely considered as being backed up by the Chinese government, are
less risky than private firms from the point of view of foreign banks, which further exacerbates the existing discrimination against POEs.

IV. Data, Empirical Method, and Results

A. Datasets and the Difference-in-Difference Approach

The datasets used in this study were constructed by the NBS and collected through annual surveys of all large-scale industrial firms in the PRC. On average, they cover close to 190,000 enterprises, from 37 two-digit manufacturing industries and 31 provinces every year. Given that the PRC’s WTO-accession took place at the end of 2001, we employ post-WTO data for the period 2002–2007.

To obtain clean samples of data, we adopt several strategies to delete outliers and irregular observations. In particular, following Yu (forthcoming) and Feenstra, Li, and Yu (2014), we leave out observations if any of the following are true: liquid assets are greater than total assets, total fixed assets are greater than total assets, the net value of fixed assets is greater than total assets, the firm’s identification number is missing, and invalid established time exists (e.g., the opening month is later than December or earlier than January).

The key indicator we analyze in this study is total factor productivity (TFP). In order to avoid possible estimation biases commonly encountered in the Solow residual estimation approach, we adopt the consistent semi-parametric estimation method first developed by Olley and Pakes (1996). Using NBS firm survey data, Lu and Lian (2012) compared different TFP estimates using different approaches—including ordinary least squares and fixed effects regression and methods developed by Olley and Pakes (1996) and Levinsohn and Petrin (2003)—and concluded that the Olley and Pakes approach is relatively better. We also estimate TFP using the Solow residual approach as a robustness check.

The gradual opening up of the PRC to foreign banks is an excellent laboratory to study the impact of foreign bank entry. The exogenous policy plan allows us to construct a counterfactual using the DID approach. As in Lin (2011), firms located in regions where foreign bank credit was unavailable and hence plausibly unaffected by foreign bank entry, comprise the control group. Comparing changes in the productivity of firms with access to foreign bank lending to those of firms without such access provides a causal effect of foreign bank entry.

We formulate the following basic DID fixed effects model:

\[ Y_{it} = c + \alpha_i + \mu_t + \beta \text{Foreign}_{it} + \gamma_0 X_{it} + \epsilon_{it} \]  

\[ (1) \]

Following Cai and Liu (2009), we delete observations with missing information on critical parameters such as total assets, the number of employees, gross value of industrial output, net value of fixed assets, and sales. We also drop firms with fewer than eight workers as they fall under a different legal regime, as mentioned in Brandt, van Biesebroeck, and Zhang (2012).
where $Foreign_{it}$ represents a dummy variable that is equal to 1 when foreign bank loans are available in the region of firm $i$ at the beginning of year $t$ for local-currency business with domestic enterprises, and 0 otherwise. $Y_{it}$ is the dependent variable, which takes the form of either per capita output, the capital/labor ratio, or TFP (all in logarithms). $X_{it}$ is a vector of control variables that includes the age of the firm and, in log form, total assets, gross domestic product (GDP), and the population of the city where the firm is located. We also control for firm fixed effects $\mu_t$ and time fixed effects $\alpha_i$.

Of these variables, TFP estimates are more subject to criticism, as they often depend on the estimation method applied. In this study, we use the consistent semi-parametric estimator developed by Olley and Pakes (1996). As a robustness check, we also calculate TFP using the Solow residual.

We first estimate Equation (1) with output per worker as the dependent variable, using the full sample as well as subsamples, and by different ownership types as defined by the largest shareholder (Table 1). The Hausman test results suggest that fixed effects estimation is more suitable than random effects estimation.

The coefficient estimate for foreign bank entry is significantly positive for the full sample, confirming that financial opening does improve output per worker or labor productivity (by 2%). However, repeating the same regression for different ownership groups reveals some interesting results: While the impact is positive for POEs (4.52%), it is negative for SOEs and COEs and insignificant for FIEs. The age of the firm has a negative impact on output per worker, while the amount of total assets has a positive impact. These results appear to be consistent with expectations. The control variables at the regional level, local GDP and population, do not have a significant effect.

We then decompose the above dependent variable output per worker into the capital–labor ratio and TFP, and repeat the regression of Equation (1). It turns out that foreign bank entry has no effect on firms’ capital–labor ratio, both at the aggregate and at the disaggregated level (Table 2). The effects on TFP, however, have exactly the same signs as those on output per worker (Table 3). Specifically, foreign bank entry increases TFP of POEs by 4.63%, while decreasing TFP of SOEs and COEs by 3.39% and 3.66%, respectively. Comparing the above three sets of regression results shows that foreign bank entry affects output per worker mainly through its influence on productivity.

Clearly, different effects on different ownership groups—i.e., negative on SOEs and COEs, positive on POEs, and insignificant on FIEs—reveal an interesting

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3There are two main measures of foreign bank entry used in the literature: one is the number of foreign banks and the other is the amount of total assets (or share of assets) of foreign banks (McFadden 1994, Clarke et al. 1999, Unite and Sullivan 2003, Shen et al. 2009). Unfortunately, we were not able to use either of these measures due to unavailable information. Another reason we adopted the second measure is that the first measure includes information about both existence of foreign banks and scale of foreign banks. However, total assets of foreign banks in the PRC are still too small to exert influence through scale, which we call a direct effect. A 0–1 dummy captures the effect of the existence of foreign banks, for example, competition pressure for domestic banks, which we call an indirect effect.
Table 1. The Basic Model (Output per Worker)

|                      | Full Sample | SOEs | COEs | POEs | FIEs |
|----------------------|-------------|------|------|------|------|
| Foreign              | 0.0203*     | -0.0358*** | -0.0354** | 0.0452*** | 0.000998 |
|                       | (0.0119)    | (0.0131) | (0.0142) | (0.0139) | (0.0234) |
| Age                  | -0.00245*** | -0.00112 | -0.00126* | -0.000836** | -0.000774 |
|                       | (0.000365)  | (0.000677) | (0.000719) | (0.000414) | (0.00129) |
| Log(Assets)          | 0.223***    | 0.227*** | 0.244*** | 0.213*** | 0.289*** |
|                       | (0.00825)   | (0.0142) | (0.0181) | (0.00848) | (0.0169) |
| Log(GDP)             | -0.0535     | 0.0536  | 0.00336 | -0.00260 | -0.0258 |
|                       | (0.0962)    | (0.0556) | (0.00899) | (0.107) | (0.0839) |
| Log(Population)      | -0.0190     | -0.155*** | -0.0479 | -0.0539 | 0.00344 |
|                       | (0.0551)    | (0.0459) | (0.0558) | (0.0724) | (0.0247) |
| Constant             | 3.365***    | 3.197*** | 3.514*** | 3.964*** | 2.752*** |
|                       | (0.394)     | (0.299) | (0.555) | (0.515) | (0.647) |
| Observations         | 1,202,542   | 68,486 | 93,810 | 860,374 | 179,872 |
| R-squared            | 0.217       | 0.219  | 0.209  | 0.235  | 0.140  |
| Number of Firms      | 318,464     | 25,450 | 43,313 | 252,590 | 53,536  |
| Clustered at Region  | Yes         | Yes    | Yes    | Yes    | Yes    |
| Year Dummy           | Yes         | Yes    | Yes    | Yes    | Yes    |
| Industry Dummy       | No          | No     | No     | No     | No     |
| Firm Specified       | Yes         | Yes    | Yes    | Yes    | Yes    |
| Hausman Test (p-value) | 0.0001   | 0.0000 | 0.0002 | 0.0000 | 0.0000 |

COEs = collective-owned enterprises, FIEs = foreign-invested enterprises, GDP = gross domestic product, POEs = privately owned enterprises, SOEs = state-owned enterprises, \(*^{**} = p < 0.01, *^{*} = p < 0.05, * = p < 0.1.\)

Notes: The dependent variable is the log of output per worker. Robust standard errors in parentheses. Hausman test (p-value) < 0.05 indicates a fixed effects model is preferred over a random effects model.

Source: Authors’ computations.

Table 2. The Basic Model (Capital–Labor Ratio)

|                      | Full Sample | SOEs | COEs | POEs | FIEs |
|----------------------|-------------|------|------|------|------|
| Foreign              | -0.0119     | -0.0117 | 9.72e-05 | -0.00476 | -0.000188 |
|                       | (0.00745)   | (0.0105) | (0.0120) | (0.00863) | (0.00888) |
| Age                  | -0.00160*** | -0.00123* | -0.000526 | -0.00126*** | -0.00772*** |
|                       | (0.000294)  | (0.000630) | (0.000961) | (0.000295) | (0.00214) |
| Log(Assets)          | 0.515***    | 0.545*** | 0.497*** | 0.529*** | 0.355*** |
|                       | (0.0124)    | (0.0192) | (0.0279) | (0.0120) | (0.0289) |
| Log(GDP)             | -0.0969     | 0.0320  | -0.0188 | -0.0404 | -0.200*** |
|                       | (0.0674)    | (0.0423) | (0.0662) | (0.0612) | (0.0694) |
| Log(Population)      | 0.0668**    | 0.0308  | 0.0851  | 0.0669*  | 0.0700*** |
|                       | (0.0263)    | (0.0402) | (0.0875) | (0.0360) | (0.0126) |
| Constant             | -1.179***   | -1.817*** | -1.595*** | -1.494*** | 1.240*** |
|                       | (0.376)     | (0.319) | (0.798) | (0.293) | (0.471) |
| Observations         | 1,202,245   | 68,418 | 93,784 | 860,188 | 179,855 |
| R-squared            | 0.155       | 0.127  | 0.142  | 0.175  | 0.058  |
| Number of Firms      | 318,167     | 25,382 | 43,287 | 252,404 | 53,519  |
| Clustered at Region  | Yes         | Yes    | Yes    | Yes    | Yes    |
| Year Dummy           | Yes         | Yes    | Yes    | Yes    | Yes    |

COEs = collective-owned enterprises, FIEs = foreign-invested enterprises, GDP = gross domestic product, POEs = privately owned enterprises, SOEs = state-owned enterprises, \(*^{**} = p < 0.01, *^{*} = p < 0.05, * = p < 0.1.\)

Notes: The dependent variable is the log of the capital–labor ratio. Robust standard errors in parentheses.

Source: Authors’ computations.
story, with strong policy implications. One way of thinking about these results is that repressive financial policies discriminate against POEs but favor SOEs and COEs. Foreign bank entry may be viewed as a way to reverse the effects of financial repression. Therefore, previously favored firms become worse off as a result of the financial liberalization, while previously discriminated firms become better off.

The specific mechanisms through which such policy effects play out will be investigated later. The insignificant effect on FIEs is a natural consequence since, as we stressed above, foreign entry here refers to the opening up of foreign banks’ business with domestic firms, thus affecting FIEs less. Moreover, FIEs are neither too discriminated as POEs nor too favored as SOEs and COEs by financial repression policies.

B. Robustness Checks

Before exploiting detailed channels of policy effects, we take four steps to check the robustness of the result and validate the above findings. First, we repeat regressions of Equation (1) applying an alternative set of TFP estimates and an alternative definition of ownership. Second, we use a two-period estimation method to avoid possible bias caused by correlation in a multi-period DID approach. Third, we perform placebo exercises. Finally, to deal with the concern that there might have been a pre-existing trend in the different areas, we replace the indicator variable...
Table 4. Firm Characteristics and Benefits from Foreign Bank Entry (Total Factor Productivity)

|                          | Full Sample | SOEs          | COEs          | POEs          | FIEs          |
|--------------------------|-------------|---------------|---------------|---------------|---------------|
| Foreign × Large          | 0.117***    | 0.0961***     | 0.0451**      | 0.129***      | 0.0992***     |
|                          | (0.0104)    | (0.0214)      | (0.0200)      | (0.0125)      | (0.0132)      |
| Foreign × Old            | 0.141***    | 0.0619***     | 0.0608***     | 0.152***      | 0.0756***     |
|                          | (0.0119)    | (0.0199)      | (0.0180)      | (0.0140)      | (0.0135)      |
| Foreign × High-profit    | 0.0274      | −0.0293*      | −0.0135       | 0.0583***     | −0.0161       |
|                          | (0.0180)    | (0.0177)      | (0.0221)      | (0.0207)      | (0.0142)      |
| Foreign × High-collateral| 0.194***    | 0.0917***     | 0.108***      | 0.204***      | 0.163***      |
|                          | (0.0119)    | (0.0194)      | (0.0183)      | (0.0144)      | (0.0129)      |
| Year Dummy               | Yes         | Yes           | Yes           | Yes           | Yes           |
| Industry Dummy           | Yes         | Yes           | Yes           | Yes           | Yes           |
| Firm Specified           | Yes         | Yes           | Yes           | Yes           | Yes           |

COEs = collective-owned enterprises, FIEs = foreign-invested enterprises, POEs = privately owned enterprises, SOEs = state-owned enterprises. *** = p < 0.01, ** = p < 0.05, * = p < 0.1.
Notes: The dependent variable is the log of total factor productivity. Robust standard errors in parentheses.
Source: Authors’ computations.

*Foreign* in Equation (1) with trend indicators (specifically, *Before*3, *Before*2, *Before*1, *Before*0, *After*1, *After*2, and *After*3), which are dummy variables representing the years before or after policy implementation (see Appendix Tables A1–A4).

The robustness checks confirm our findings of the positive effects of foreign bank entry on TFP for the entire sample and for POEs. The effects are not significant for FIEs in all exercises. While the findings for SOEs and COEs vary in some cases, most exercises confirm negative effects of foreign bank entry.

V. Possible Transmission Channels

Before investigating the transmission channels of policy, we carry out a quick exercise to see which features of the firm help increase efficiency benefits from foreign bank entry. To do so, we adopt the following simple model:

\[
\log(TFP) = c + \alpha_i + \mu_t + \beta \text{Foreign}_{it} + \beta_1 \text{Foreign}_{it} \times Z_i + \gamma_0 X_{it} + \varepsilon_{it} \tag{2}
\]

where \( Z_i \) is a set of dummy variables reflecting pre-foreign bank entry conditions. We take the averages of the corresponding variables over the period 1998–2001. \( Z_i \) is equal to 1 if firm \( i \)'s variable value is greater than the median value of all firms; otherwise, \( Z_i = 0 \). We focus on four firm-specific characteristics, including size (large or small), age (old or young), profits (high or low), collateral (high or low).4

The results suggest that firms that are larger, older, and with more collateral receive greater benefits from foreign bank entry in terms of efficiency performance,  

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4We define collateral as the ratio between fixed and total assets.
regardless of ownership type (Table 4). The findings on collateral differ from the insignificant result observed by Lin (2011). This may be due to the different samples used. Lin (2011) focused on listed firms, for which collateral was probably a less important screening device.

Results on firm profitability are more interesting. More profitable POEs seem to enjoy greater efficiency improvements, while less profitable SOEs benefit more from foreign bank entry. The latter result probably traced to the fact that profitable SOEs already received sufficient financial services prior to foreign bank entry.

Table 4 provides a preliminary hypothesis of foreign bank entry—succinctly, that foreign bank entry helps improve the efficiency of the domestic banking system. Specifically, bigger and more mature firms and those with higher collateral levels—in other words, those that have hard information—benefit more from foreign bank entry. It seems that foreign bank entry increases transactions-based lending instead of relationship lending. This is consistent with the literature that foreign banks are disadvantaged by language and cultural barriers and thus rely more on efficiency and firms’ hard information (Blomström and Kokko 1998).

We now try to provide further empirical evidence to the above hypothesis and offer more detailed explanations for the findings from the basic model by exploiting two possible transmission channels. The first is that foreign bank entry reduces financing constraints, especially of the POEs. The second is that foreign bank entry intensifies competition in the domestic banking sector, which in turn improves POEs’ TFP.

A. Easing Financing Constraints

We adapt Equation (1) into the following:

\[
\log(TFP)_{ijt} = c + \alpha_i + \mu_t + \beta_0 \text{Foreign}_{it} + \beta_1 \text{Foreign}_{it} \times \text{Index}_{j}^{\text{exd}} + \beta_2 \text{Index}_{j}^{\text{exd}} + \gamma_0 X_{it} + \epsilon_{it} \tag{3}
\]

5The two terms are defined in Berger and Udell (2002) who state that financial intermediaries lending can be categorized into at least four main distinct lending technologies: financial statement lending, asset-based lending, credit scoring, and relationship lending. According to the authors, the first three lending technologies are often referred to as transactions-based lending; under which the lending decisions are "based on ding, under which.

6A large finance and macroeconomics literature interprets greater investment–cash flow sensitivity for firms as evidence that they are indeed financially constrained (e.g., Fazzari, Hubbard, and Petersen 1988). However, the paper by Kaplan and Zingales (1997) questions this interpretation. They pointed out that the underlying assumption behind this approach—the monotonic relationship between financing constraints and investment–cash flow sensitivity—may not be true. Their study was later supported by other economists such as Cleary (1999). Though Kaplan and Zingales (1997, 172) admitted that their results may be “specific to distressed firms that are forced to use cash flow to repay their debt, and may not apply to more ‘normal’ samples,” we doubt that firms in the PRC are qualified enough to be “normal.” Another reason why we abandon this approach is that the original dataset does not contain the variable cash flow, which needs to be indirectly calculated from other variables or by proxy. However, as Kaplan and Zingales (1997, 171) pointed out, cash flow itself may already “act as a proxy for investment opportunities not captured by Tobin’s Q and do so differentially across firms.” The indirect calculation of cash flow might further exacerbate this concern.
Table 5. Financial Constraints and Foreign Bank Entry (Total Factor Productivity)

|                  | SOEs | COEs | POEs | FIEs |
|------------------|------|------|------|------|
| Foreign × Index  | 0.107| −0.00472 | 0.0493* | 0.0182 |
| (0.0668)         | (0.0380) | (0.0201) | (0.0232) |
| Foreign          | 0.000327 | −0.0272* | 0.0460** | −0.00534 |
| (0.0147)         | (0.0146) | (0.0131) | (0.0236) |
| Index            | −0.138* | 0.0917* | 0.0314 | −0.0162 |
| (0.0724)         | (0.0470) | (0.0203) | (0.0282) |
| Age              | 0.000690 | −0.000610 | 0.000306 | 0.00223 |
| (0.000863)       | (0.000767) | (0.000415) | (0.00141) |
| Log(Assets)      | −0.101*** | −0.0976*** | −0.0699*** | 0.00428 |
| (0.0156)         | (0.0147) | (0.00748) | (0.0138) |
| Log(GDP)         | 0.0151 | −0.0269 | −0.00111 | 0.0506 |
| (0.0679)         | (0.102) | (0.0948) | (0.0663) |
| Log(Population)  | −0.156*** | −0.0771 | −0.0640 | −0.0314 |
| (0.0635)         | (0.0707) | (0.0612) | (0.0243) |
| Constant         | 1.607*** | 2.086*** | 1.663*** | 0.686* |
| (0.371)          | (0.599) | (0.463) | (0.367) |

Observations 41,192 73,705 761,091 164,304
R-squared 0.018 0.012 0.009 0.012
Number of Firms 15,969 33,598 218,458 48,377
Clustered at Region Region Region Region
Year Dummy Yes Yes Yes Yes

COEs = collective-owned enterprises, FIEs = foreign-invested enterprises, GDP = gross domestic product,
POEs = privately owned enterprises, SOEs = state-owned enterprises, *** = p < 0.01, ** = p < 0.05,
* = p < 0.1.

Note: The dependent variable is the log of total factor productivity. Robust standard errors in parentheses.
Source: Authors’ computations.

where \( \text{Index}_{i}^{exd} \) represents the demand for external funds of industry \( j \) that firm \( i \) is part of. Because the actual external financing demand in the PRC is not observable, we follow Rajan and Zingales (1998) in using the dependence of US firms on external financing as a proxy for the demand for external funds in the PRC. There is a detailed discussion on why this is a reasonable approach in Rajan and Zingales (1998), who used this dependency index as a proxy for external financing dependency in developing countries.

In Equation (3), based on our hypothesis above, we expect \( \beta_1 \), the coefficient for the interaction term of \( \text{Index}_{i}^{exd} \) and \( \text{Foreign}_{it} \), to be positive in the regression of private firms. This means that foreign bank entry benefits firms in industries that have high dependency on external financing; in other words, foreign bank entry eases the damage of financing constraints on the efficiency of private firms. This is exactly what the estimation results reveal (Table 5).

B. Increasing Competition in the Banking Sector

To investigate the relationship between the effect of foreign bank entry on banking competition and in turn on firm TFP, we apply a two-step approach to
construct the link, following Klein and Olivei (2008) and Acemoglu and Can- toni (2011). First, we use provincial data to regress a bank competition index
(BankCompt) on foreign bank entry (Foreign). Second, we regress TFP on the esti-
mated value of BankCompt, which is the calculated change in the bank competition
index due to foreign bank entry.

The two-step model consists of the following specifications:

\[
\text{BankCompt}_{pt} = c + \alpha_p + \mu_t + \gamma_0 \text{Foreign}_{pt} + \varepsilon_{pt} \quad \text{(First step)} \tag{4}
\]

\[
\log(TFP)_{it} = c + \alpha_i + \mu_t + \beta_0 \text{BankCompt}_{pt} + \gamma_0 X_{it} + \varepsilon_{it} \quad \text{(Second step).} \tag{5}
\]

The bank competition index used in this paper is based on Fan, Wang, and Zhu
(2003, 2004, 2007, 2010), who compute the NERI Index of Marketization for
provinces in the PRC. The index is the share of deposits in non-state-owned financial
institutions. Since financial institutions in the PRC are almost all banks, we use this
index to reflect the competiveness in the banking sector.

Table 6 summarizes the estimation results for Equation (4). Foreign bank
entry actually intensifies banking competition based on the significantly positive
coefficient estimates. To check if the conclusion is model-dependent, we also include
provincial GDP and provincial population (both in log form) as control variables
and add a time trend to the equation. In all these exercises, the main finding remains
unchanged.
Empirical results of Equation (5) confirm that increases in bank competition brought about by foreign bank entry positively impact industrial efficiency for POEs but negatively for SOEs. The effects are not significant for COEs and FIEs (Table 7). The result is consistent with literature. The effect of foreign bank entry is often indirect, not affecting accumulation but rather allocative efficiency.

VI. Concluding Remarks

This study finds that foreign bank entry following the WTO accession generally had a positive effect on the efficiency of Chinese industry. At the disaggregated level, however, the impact differed across ownership groups: significantly positive for private enterprises, significantly negative for state and collective industries, and insignificant for foreign companies. While the above overall impact is consistent with predictions based on economic theory, the contrasting effects on state versus private sectors are somewhat surprising.

The general positive effect seems to support the theory in literature that foreign bank entry in emerging markets can improve domestic banking efficiency. However, the negative impact on SOEs is contradictory to the so-called cream-skimming effect and the impact of information asymmetry problems highlighted in the literature, such as Bonin and Huang (2002), and at odds with our hypothesis. Our analysis of transmission channels proves that foreign bank entry does raise competition among banks. POEs, which are recognized as being heavily discriminated against by banks and facing severe financial constraints, are positively affected by foreign bank entry. Our channel analysis suggests that foreign bank entry eased financial constraints faced by POEs, which is in line with predictions that foreign bank entry can improve bank efficiency.

The right framework by which to rationalize the above policy effects is that of financial repression. In an economy with seriously repressive financial policies, which is a reasonable depiction of the current situation in the PRC, the state sector is often strongly favored, while the private sector is discriminated against. Introduction of foreign banks reduces the effect of repressive policies and therefore should reverse previous policy effects. This means hurting state enterprises but benefiting private enterprises, other things being equal.

But how does this work? What are the channels given that foreign banks do not really focus on lending to the private sector? In this study, we identify two potential transmission mechanisms—one through financing constraints and the other through bank competition. The two, however, may be interrelated. Most firms face external financing constraints, particularly in the private sector, which hurts firms’ efficiency performance. With foreign bank entry, financing constraints still have a negative impact on efficiency, but the magnitude is significantly reduced. Likewise, foreign bank entry increases competition in the domestic banking
**Table 7. Foreign Bank Entry, Bank Competition, and Firm TFP (Step 2)**

| Variable                  | SOEs  | COEs  | POEs  | FIEs  | SOEs  | COEs  | POEs  | FIEs  |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Estimated BankCompt       | −0.0561** | −0.0454 | 0.130*** | 0.0242 | −0.0479* | −0.0391 | 0.133*** | 0.0219 |
|                           | (0.0282) | (0.0319) | (0.0310) | (0.0539) | (0.0280) | (0.0314) | (0.0306) | (0.0521) |
| Age                       | −0.000188 | −0.000777 | 0.000164 | 0.00331** |
|                           | (0.000694) | (0.000688) | (0.000393) | (0.00144) |
| Log(Assets)               | 0.0313* | 0.0605*** | 0.0236** | 0.179*** |
|                           | (0.0160) | (0.0172) | (0.0111) | (0.0221) |
| Log(GDP)                  | 0.0585 | 0.0142 | 0.0287 | 0.0446 |
|                           | (0.0498) | (0.0788) | (0.0916) | (0.0636) |
| Log(Population)           | −0.203*** | −0.110 | −0.0910 | −0.0279 |
|                           | (0.0477) | (0.0722) | (0.0640) | (0.0219) |
| Constant                  | 0.962*** | 1.424*** | −0.0849 | 0.707 | 1.216*** | 1.257** | −0.0741 | −1.354* |
|                           | (0.223) | (0.277) | (0.278) | (0.484) | (0.338) | (0.502) | (0.601) | (0.767) |
| Observations              | 65,903 | 88,422 | 843,231 | 170,117 | 65,903 | 88,422 | 843,231 | 170,117 |
| R-squared                 | 0.003 | 0.003 | 0.007 | 0.010 | 0.004 | 0.006 | 0.008 | 0.030 |
| Number of Firms           | 24,364 | 40,817 | 247,514 | 51,315 | 24,364 | 40,817 | 247,514 | 51,315 |
| Clustered at              | Region | Region | Region | Region | Region | Region | Region | Region |
| Year Dummy                | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    | Yes    |

COEs = collective-owned enterprises, FIEs = foreign-invested enterprises, GDP = gross domestic product, POEs = privately owned enterprises, SOEs = state-owned enterprises, TFP = total factor productivity. ** = p < 0.01, * = p < 0.05. Note: The dependent variable is the log of TFP. Robust standard errors in parentheses. Source: Authors’ computations.
sector, which in turn improves industrial efficiency. In practical terms, foreign banks probably still deal mainly with large state and foreign companies. By competing for the same businesses with local banks, especially the large state-owned commercial banks, foreign banks force local banks to extend services to those clients not previously covered. Private enterprises’ financing conditions improve as a result.

Our results offer important policy implications. On the one hand, foreign bank entry is generally beneficial for the PRC’s economy. This evidence lends some support to the authorities’ new initiative to achieve greater financial openness. On the other hand, financial opening, which reverses previous repressive policy, may also cause significant corrections, especially in previously protected sectors. Reform programs should be designed with caution to ensure a smooth transition. While the case of foreign bank entry is useful for thinking about future reform steps to take, it is important to remember that opening up to foreign capital is quite different from opening up to foreign banks. However, the risk–reward framework offers the basis for policy deliberation.

The current study has a number of shortcomings. As the study does not use banking data at the micro level, it fails to reveal any information about changes in bank behavior after foreign bank entry, which could help better explain the mechanism by which foreign bank entry affects industrial efficiency. For instance, did foreign bank entry actually increase or reduce banks’ interest rate spread, operating costs, profitability, and credit supply? Meanwhile, as the current policy debate centers around the issue of capital account liberalization, foreign bank entry is probably not the best case study to offer policy advice. Foreign bank entry is akin to direct investment, while capital account liberalization is akin to portfolio investment. These two could be very different in nature but should be the subject of another academic paper.

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*ADB recognizes “China” as the People’s Republic of China.
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Appendix

The two most important variables in our analyses are TFP and ownership. In the above analysis, ownership type is defined by the largest shareholder. As a robustness check, we alter the definition of ownership by only recognizing those with more than 50% stake of firms and then repeating the same regressions (Table A.1). TFP estimates are subject to criticism because they are often dependent on the estimation approach applied. In this study, we used the Olley and Pakes method but, as another robustness check, we also calculate TFP estimates using the Solow residual approach (Gary, Rawski, and Zhang 2008) and repeat the same regressions (Table A.2). Both exercises validate findings of the different effects of foreign bank entry on the four groups of firms with different ownership.

According to Bertrand, Duflo, and Mullainathan (2004), using DID that relies on many years of data may ignore the bias in estimated standard errors that serial correlation introduces. To deal with this problem, we adopt the method of Yu and Liang (2014) by only keeping firms that existed in the dataset both before and after foreign bank entry and then taking averages of all variables before and all variables after foreign bank entry. This way, we construct a two-period balanced panel dataset. We re-estimate Equation (1) using this newly constructed dataset. This time, the estimated effects on SOEs and COEs become insignificant, like those on FIEs. However, the effects on the full sample and on POEs remain significantly positive (Table A.3).
### Table A.1. Robustness Check—Alternative Definition of Ownership

|              | SOEs       | COEs       | POEs       | FIEs       |
|--------------|------------|------------|------------|------------|
| Foreign      | −0.0353*** | −0.0366*** | 0.0466***  | 2.01e-05   |
|              | (0.0130)   | (0.0137)   | (0.0132)   | (0.0229)   |
| Age          | −0.000456  | −0.000879  | 6.78e-05   | 0.00319**  |
|              | (0.000687) | (0.000714) | (0.000412) | (0.00140)  |
| Log(Assets)  | 0.0259*    | 0.0649***  | 0.0253**   | 0.187***   |
|              | (0.0157)   | (0.0189)   | (0.0114)   | (0.0229)   |
| Log(GDP)     | 0.0408     | 0.00199    | 0.0124     | 0.0516     |
|              | (0.0559)   | (0.0833)   | (0.0939)   | (0.0614)   |
| Log(Population) | −0.178*** | −0.0838    | −0.0774    | −0.0269    |
|              | (0.0506)   | (0.0667)   | (0.0636)   | (0.0211)   |
| Constant     | 0.933***   | 0.855*     | 1.077**    | −1.290**   |
|              | (0.304)    | (0.505)    | (0.485)    | (0.547)    |
| Observations | 67,778     | 93,288     | 859,564    | 179,522    |
| R-squared    | 0.004      | 0.007      | 0.007      | 0.033      |
| Number of Firms | 25,113   | 43,080     | 252,275    | 53,394     |
| Clustered at | Region     | Region     | Region     | Region     |
| Year Dummy   | Yes        | Yes        | Yes        | Yes        |

COEs = collective-owned enterprises, FIEs = foreign-invested enterprises, GDP = gross domestic product, POEs = privately owned enterprises, SOEs = state-owned enterprises, TFP = total factor productivity, *** = p < 0.01, ** = p < 0.05, * = p < 0.1.

Note: The dependent variable is the bank competition index (BankCompt). Robust standard errors in parentheses.

Source: Authors’ computations.

### Table A.2. Robustness Check—Alternative Estimates of TFP

|              | SOEs       | COEs       | POEs       | FIEs       |
|--------------|------------|------------|------------|------------|
| Foreign      | −0.0354*** | −0.0379*** | 0.0468***  | 0.00350    |
|              | (0.0127)   | (0.0135)   | (0.0132)   | (0.0219)   |
| Age          | −0.000270  | −0.000578  | 0.000165   | 0.00239*   |
|              | (0.000653) | (0.000646) | (0.000404) | (0.00121)  |
| Log(Assets)  | 0.160***   | 0.195***   | 0.165***   | 0.306***   |
|              | (0.0146)   | (0.0178)   | (0.0107)   | (0.0249)   |
| Log(GDP)     | 0.0367     | 0.00600    | 0.00714    | 0.0286     |
|              | (0.0556)   | (0.0899)   | (0.0950)   | (0.0748)   |
| Log(Population) | −0.167*** | −0.0657    | −0.0661    | −0.0166    |
|              | (0.0483)   | (0.0606)   | (0.0643)   | (0.0243)   |
| Constant     | 0.456      | 0.497      | 0.785      | −1.217*    |
|              | (0.300)    | (0.499)    | (0.483)    | (0.651)    |
| Observations | 68,418     | 93,784     | 860,188    | 179,855    |
| R-squared    | 0.112      | 0.117      | 0.162      | 0.129      |
| Number of Firms | 25,382   | 43,287     | 252,404    | 53,519     |
| Clustered at | Region     | Region     | Region     | Region     |
| Year Dummy   | Yes        | Yes        | Yes        | Yes        |

COEs = collective-owned enterprises, FIEs = foreign-invested enterprises, GDP = gross domestic product, POEs = privately owned enterprises, SOEs = state-owned enterprises, TFP = total factor productivity, *** = p < 0.01, ** = p < 0.05, * = p < 0.1.

Note: The dependent variable is the bank competition index (BankCompt). Robust standard errors in parentheses.

Source: Authors’ computations.
**Table A.3. Robustness Check, Two-period DID Approach**

|                        | Full Sample | SOEs  | COEs  | POEs  | FIEs |
|------------------------|-------------|-------|-------|-------|------|
| Foreign                | 0.219***    | -0.0225 | 0.0446 | 0.315*** | -0.0124 |
| (0.0322)               | (0.0341)    | (0.0552) | (0.0336) | (0.0382) |
| Log(Assets_2p)        | 0.0253*     | 0.124*** | 0.0829*** | -0.00724 | 0.193*** |
| (0.0136)               | (0.0228)    | (0.0252) | (0.0133) | (0.0287) |
| Age_2p                 | -0.000779*** | -0.000736* | -0.000874** | -0.000438** | -0.000973*** |
| (0.000169)             | (0.000401)  | (0.000348) | (0.000196) | (0.000238) |
| Log(Population_2p)    | 0.0946      | -0.237** | -0.123 | 0.238* | 0.00321 |
| (0.103)                | (0.0935)    | (0.123)  | (0.122)  | (0.0704)  |
| Log(GDP_2p)           | -0.346***   | 0.133*   | -0.0695 | -0.515*** | -0.174*** |
| (0.0510)               | (0.0708)    | (0.0849) | (0.0656) | (0.0532) |
| Constant               | 2.291***    | -0.286   | 1.317** | 2.841*** | 0.228 |
| (0.499)                | (0.405)     | (0.559)  | (0.572)  | (0.494) |

| Observations           | 354,632     | 23,538 | 35,458 | 247,770 | 47,866 |
| R-squared              | 0.025       | 0.020  | 0.011  | 0.047   | 0.049 |
| Number of Firms        | 177,316     | 15,991 | 27,622 | 138,781 | 27,061 |
| Clustered at Region    | Yes         | Yes    | Yes    | Yes     | Yes    |
| Year Dummy             | Yes         | Yes    | Yes    | Yes     | Yes    |

COEs = collective-owned enterprises, DID = Difference-in-Difference, FIEs = foreign-invested enterprises, GDP = gross domestic product, POEs = privately owned enterprises, SOEs = state-owned enterprises, TFP = total factor productivity, "***" = p < 0.01, "**" = p < 0.05, "*" = p < 0.1.

Note: The dependent variable is the bank competition index (BankCompt). Robust standard errors in parentheses.

Source: Authors’ computations.

Our analysis exploits time and spatial variations in foreign bank entry. Since the entry process is staged but clustered within just a few years, there are lingering concerns about the extent to which the exact timing of the reform matters for the identified effects. We would also like to rule out the possibility that reform indicators pick up shocks unrelated to foreign bank entry that could be present in some cities. In the placebo exercise, we assign a certain number of foreign bank entries each year to a random selection of cities, with the expectation of the number being equal to the actual value. We repeat this exercise 20 times, finding no absolute t-value and R-squared values of the placebo regression larger than those of the actual regression. This suggests that the special distribution of foreign bank entry indeed drives our results.

There is also concern that although the exogenous gradual policy change can exclude the possibility of reverse causality, there might be a selection bias as there may already be a pre-existing trend in certain areas. Thus, we replaced the indicator variable Foreign in Equation (1) with the trend indicators Before3, Before2, Before1, Before0, After1, After2, and After3, which are dummy variables representing years before or after the policy implementation. The results reveal our conclusion to be robust—there was no significant difference between control groups and experiment groups prior to foreign bank entry that could have affected our previous results (Table A.4).
Table A.4. Robustness Check—Pre-existing Trend

|       | SOEs | COEs | POEs | FIEs |
|-------|------|------|------|------|
| before3 | 0.0393 | -0.0190 | -0.0416 | -0.0459 |
|        | (0.0259) | (0.0402) | (0.0324) | (0.0372) |
| before2 | 0.0205 | -0.0618 | 0.0776* | -0.107 |
|        | (0.0358) | (0.0525) | (0.0529) | (0.0983) |
| before1 | -0.00176 | -0.127* | 0.130 | -0.157 |
|        | (0.0451) | (0.0703) | (0.298) | (0.1696) |
| before0 | -0.0186 | -0.197* | 0.225* | -0.238 |
|        | (0.0635) | (0.102) | (0.1575) | (0.2941) |
| after1 | -0.0492 | -0.312** | 0.359** | 0.234* |
|        | (0.0778) | (0.137) | (0.1812) | (0.169) |
| after2 | -0.0636 | -0.415** | 0.497*** | 0.440 |
|        | (0.0949) | (0.169) | (0.1972) | (0.457) |
| after3 | -0.118 | -0.547** | 0.708*** | 0.551 |
|        | (0.124) | (0.201) | (0.128) | (0.498) |
| Age    | -0.000361 | -0.000705 | 0.000501 | 0.00335** |
|        | (0.000797) | (0.000610) | (0.000664) | (0.00144) |
| Log(Asset) | 0.0272 | 0.0553* | 0.0235 | 0.184*** |
|        | (0.0235) | (0.0272) | (0.0236) | (0.0189) |
| Log(GDP) | 0.0480 | 0.0345 | 0.0941 | 0.107** |
|        | (0.0659) | (0.0855) | (0.0732) | (0.0448) |
| Log(Popu) | -0.170*** | -0.0990 | -0.104** | -0.0354*** |
|        | (0.0440) | (0.0744) | (0.0474) | (0.0117) |
| Constant | 0.828** | 1.151 | 1.255** | -1.263*** |
|        | (0.390) | (0.698) | (0.610) | (0.301) |
| Observations | 68,418 | 93,784 | 860,188 | 179,855 |
| R-squared | 0.005 | 0.016 | 0.024 | 0.036 |
| Number of Firms | 25,382 | 43,287 | 252,404 | 53,519 |
| Clustered at | Region | Region | Region | Region |
| Year Dummy | Yes | Yes | Yes | Yes |

COEs = collective-owned enterprises, FIEs = foreign-invested enterprises, GDP = gross domestic product, POEs = privately owned enterprises, SOEs = state-owned enterprises, TFP = total factor productivity, ***, ** = p < 0.01, *, *= p < 0.05, * = p < 0.1.

Note: The dependent variable is the bank competition index (BankCompt). Robust standard errors in parentheses.

Source: Authors’ computations.