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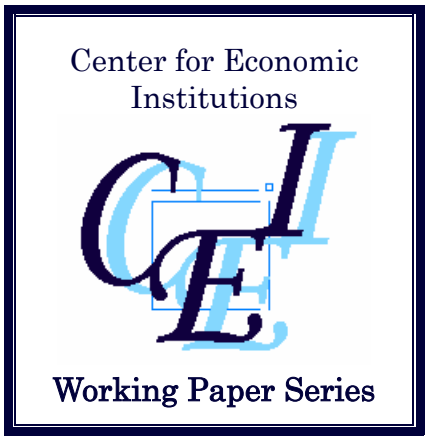

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The Effects of Foreign Bank Entry on the Thai Banking Market: Empirical Analysis from 1990 to 2002[*]

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Abstract

This paper investigates the impact of foreign bank entry on Thai domestic banks by using panel data on 17 domestic commercial banks from 1990 to 2002. The paper examines different factors affecting bank performance, including changes in the foreign ownership of banks, financial regulations, and market structure.

We find that an increase in foreign bank presence leads to a rise in overhead expenses, a decline in profits, and an increase in the interest spreads of domestic banks. In the short run, increased competition from foreign banks negatively affects domestic banks. However, in the long run, domestic banks' performance should improve.

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1. Introduction

Before the financial crisis of 1997, foreign bank entry was strictly regulated in Thailand. However, following the crisis, these restrictions were relaxed as part of the financial reforms, and foreign bank penetration increased substantially. This development is expected to be a significant catalyst for change in the domestic banking industry. Further financial deregulation is expected under the World Trade Organization (WTO) agreements and the presence of foreign financial institutions is expected to continue increasing.

A number of empirical studies have examined the effects of foreign bank entry on bank performance in transitional and emerging market economies. However, most of these relate to central European and Latin American countries, where foreign bank entry intensified from the early 1990s. Except for the pioneering research of Unite and Sullivan (2003), there have been few formal economic studies of the effects of foreign bank entry on Asian banking. To our knowledge, the only academic study on Thai banks is a seminal work by Chantapong (2003).

This paper investigates the impact of foreign bank entry on Thai domestic banks by using panel data on 17 domestic commercial banks from 1990 to 2002. This paper expands the results of Chantapong in three respects. First, Chantapong focuses on the postcrisis period (1995–2001), whereas we examine the entire development period of foreign entry from the 1990s. Second, while Chantapong's approach to estimation is ad hoc and lacks theoretical foundations, the estimated equations in this paper are based on microeconomic analysis. Third, compared with Chantapong's paper, this paper presents a more comprehensive analysis of the factors affecting bank performance. These include changes in the foreign ownership of banks, changes in financial regulations, and changes in market structure.

This paper comprises five sections. In section 2, we briefly review related studies, including recent studies of Asian banking markets and then summarize their major findings and limitations. In section 3, drawing on previous studies, we explain the expected effects of foreign entry on Thai domestic banks. In section 4, we present an overview of the evolution of foreign bank entry in the Thai banking market between 1990 and 2002. In section 5, we present a regression analysis of the impact of foreign entry. In section 6, we summarize the empirical results and offer suggestions for further research.

Our analysis indicates that an increase in foreign bank presence leads to a rise in overhead expenses, a decline in profits, and an increase in the interest spreads of domestic banks. In the short run, foreign bank entry is likely to have negative effects on the operations of domestic banks by increasing competition. In the long run, however, the overall performance of domestic banks is expected to improve.

2. Related Studies

There have been many empirical studies examining the effects of foreign bank entry in developing countries. The studies are based on bank-level panel data from financial statements, which are analyzed by pooling cross-bank time series data with balance-sheet data and income statement ratios for domestic and foreign banks.

Most existing studies relate to eastern and central European countries and Latin American countries, where foreign bank entry became intense in the late 1980s. These studies include those by Barajas et al. (2000), Claessens and Jansen (2000), Bhattacharaya et al. (1997), Clarke et al. (2001), Claessens et al. (2001), Denizer (1999), Levine (1996), and Litan et al. (2001).

These studies can be classified into two groups: those that examine effects across countries, and those that focus on the effects of foreign bank entry on particular countries. Both cross-country and single-country studies use simple regression on an equation of the form shown below. The dependent variables, ***X***, are efficiency or activity indicators that are considered to represent different aspects of bank performance, such as cost efficiency, profit efficiency, lending activity, and loan quality. The independent variables are a set of foreign bank entry indicators, ***FOR***, and other control variables that are expected to affect bank performance. The control variables typically include a vector of bank-specific indicators, ***BS***, a vector of banking-sector structure variables, ***BSD***, and a vector of macroeconomic variables, ***MACRO***.

$$X = f\left(FOR, BS, BSD, MACRO\right)$$

These empirical studies indicate that foreign entry has a positive impact on bank performance in transitional and emerging market economies. According to the World Bank's (2001) summary of these studies, an increased presence of foreign banks in the market has the following effects. (1) It reduces the profits of domestic banks. (2) It improves the operational efficiency of domestic banks in the sense that their operational expenses fall. (3) While foreign bank entry introduces new financial services and new technology into the markets, it also tends to reduce the credit quality of domestic banks, which might generate financial instability.

Since foreign bank entry was strictly regulated in Asian countries before the Asian crisis of 1997, there have been few studies of foreign penetration of the Asian banking industry. Unite and Sullivan's (2003) pioneering work examines the effects of foreign bank entry on domestic banks in the Philippines between 1990 and 1998. Applying the methodology adopted by studies on other emerging markets, Unite and Sullivan found evidence of the following. (1) Interest rate spreads narrow and operating expenses decline as foreign bank entry increases. (2) Foreign bank entry is directly related to increased risk. These findings are similar to those of Denizer (1999), Claessens et al. (2001), and Barajas et al. (2000). From these findings, Unite and Sullivan draw the following conclusions. (1) Foreign competition induces domestic banks to be more efficient. (2) The increased competition induced by foreign entry forces domestic banks to take on less creditworthy customers. (3) Foreign participation induces domestic bank managers to increase spending on modernizing their operations. Overall, Unite and Sullivan conclude that liberalization of the foreign presence has had positive effects on the Philippines' domestic banking market.

The only formal academic study of Thai banks is the seminal work of Chantapong (2001).[1] Applying the methodologies used by Claessens et al. (2000), Weller (1999), and

[1] Chantapong (2001) analyzes descriptively how the operational performances of foreign banks differ from those of Thai domestic banks.

Sabi (1996), Chantapong (2003) used regression analysis to investigate the performance of domestic and foreign banks in terms of their profitability, operational costs, quality of credit, and commitment to the Thai economy. The major findings are as follows. (1) Foreign banks were more profitable than domestic banks. (2) Both domestic and foreign banks improved their profitability following the Asian crisis period. (3) The gap between the profitability of domestic and foreign banks narrowed in the postcrisis period.

Although Chantapong provides suggestive information on the effects of foreign entry on Thai banks, the analysis has limitations. First, Chantapong focuses on the postcrisis period (1995–2001). It does not cover the precrisis period of the 1990s when restrictions on foreign capital inflows were deregulated and the presence of foreign banks increased. Second, Chantapong's classification of foreign banks is problematic. According to Chantapong's classification, only purely foreign-owned banks, which are 100% owned by foreigners, are categorized as foreign banks, whereas joint-venture banks that are majority owned by foreigners are not treated as foreign banks. Purely foreign-owned banks were not allowed to have a branch network in Thailand and, consequently, their business operations focused on the wholesale markets centering on foreign companies operating in Thailand. By contrast, joint-venture banks have between 50 and 60 branches and operate in both retail and wholesale markets. The main competitors to Thai domestic banks are the joint-venture banks that were acquired by foreign investors under the financial reforms following the crisis. Chantapong's classification of Thai banks is not appropriate for examining the effects of foreign bank entry and, consequently, his empirical findings are misleading. Third, as in other studies, Chantapong does not explain the channels through which foreign penetration affects bank performance. In addition, the estimated equations adopted in the empirical analysis are ad hoc and lack theoretical foundations. These limitations make it difficult to interpret the estimation results and weaken the economic implications of the analysis. Fourth, Chantapong's regression analysis only focuses on the effects of foreign bank entry through changes in ownership structure. Effects of foreign entry that operate through different channels, such as changes in market concentration caused by foreign entrants, and changes in the market share of foreign banks, are ignored by Chantapong.

In this paper, we investigate the impact of foreign bank entry on Thai domestic banks by using panel data on 17 domestic commercial banks from 1990 to 2002. This paper represents an extension of that of Chantapong in three respects. First, we examine the entire development period of foreign entry, which was initiated by the financial liberalization of the early 1990s and accelerated by the financial reforms following the financial crisis. Second, to avoid using ad hoc empirical analysis, we carefully categorize banks and choose variables for the estimated equations on the basis of microeconomic foundations. Third, in this paper, we examine more comprehensively different factors that affect bank performance including changes in foreign ownership of banks, changes in financial regulations, and changes in market structure.

3. Predicted Effects of Foreign Entry on the Thai Banking Market

The entry of foreign banks affects the operational behavior of domestic banks through different routes. We briefly explain the paths through which increases in foreign penetration affect the business behavior of domestic banks.[2]

3. 1 The impact of foreign bank entry

If foreign banks are no different from existing domestic banks, the effect of foreign bank entry is merely an increase in the number of market players. However, foreign banks are generally recognized to have characteristics that domestic banks do not possess. Hence, the entry of foreign banks is expected to have an impact on the domestic banking market that cannot be explained by traditional theories such as the structure-conduct-performance (SCP) paradigm and the efficiency hypothesis.

An important feature associated with foreign bank entry is that it introduces new financial services and advanced management skills, which existing domestic banks lack. The new technology and skills introduced by foreign banks include new financial products, advanced IT technology, and sophisticated bank management techniques. These are expected to contribute to lower operational expenses, increased profitability, and improvements in bank risk management. Motivated by market competition, domestic banks may imitate the new financial products and management skills.

Another important feature of foreign banks is their pursuit of the profit motive. They are also independent of the vested interests of other banks because they do not form coalitions to make excessive profits. On the other hand, existing domestic banks lack effective monitoring procedures and depend on relational banking practices. Foreign penetration is expected to weaken vested interests between domestic banks and promote market competition.

The influence of foreign banks on the market environment

Entry by foreign banks affects the market environment in a way that entry by domestic banks cannot. Unlike domestic entrants, foreign entrants enhance the market by introducing new technology and management skills. Facing new foreign competitors, domestic banks are forced to react to new market entrants that differ substantially from existing domestic banks. In this context, in addition to a change in the market concentration ratio, the presence of foreign market players is significant.

One measure of the influence of foreign penetration in a banking market is the proportion of foreign banks in the banking market. In existing studies, the proportion of foreign banks has been measured in terms of the number of banks or in terms of total assets, loans, and deposits. If foreign and domestic bank entries have different effects on market competition, an increase in the foreign presence in the market is expected to affect domestic bank performance in a way that cannot be explained by either the SCP paradigm or the efficiency hypothesis.

[2] Although the effects of foreign bank entry have been estimated in many studies, some do not explain clearly the channels through which the effects of foreign bank entry operate.

The change in ownership structure

In addition to the impact on the market environment, majority ownership of domestic banks by foreign investors is likely to affect the business performance of domestic banks through restructuring and reorganization. Although banks are not majority owned by foreign investors, increased foreign ownership is expected to have a substantial impact on domestic bank performance.[3] Following the financial crisis in 1997, foreign bank penetration increased substantially in Asian countries. Arguably, this would have been a significant catalyst for change in the domestic banking industry. The commonly used measure of the influence of foreign investors is the percentage of foreign ownership of individual banks. This measure is recognized as an indicator of external monitoring activity, which is expected to improve bank practices.

This hypothesis is supported if the degree of foreign ownership significantly affects the performance of banks. When foreign ownership is measured as the percentage of foreign shareholders, greater foreign ownership is expected to contribute to changing bank performance by, for example, modernizing operations and improving business efficiency.

3. 2 The factors to be controlled for

Changes in domestic market structure

The effects of foreign entry can be overestimated because foreign entry may be associated with other effects on the market. First, foreign penetration changes the degree of market concentration, which in turn affects the performance of domestic banks. This effect is supported by traditional hypotheses such as the SCP paradigm and the efficiency hypothesis. According to the SCP paradigm, the degree of market concentration has a direct influence on the degree of competition between banks in the market. The intensified competition caused by the entry of foreign banks changes the behavior of banks. The greater is market competition, the greater is the pressure on domestic banks to reduce their operational costs and accept lower profits. This hypothesis is supported if the degree of market concentration positively affects profits.

Unlike the SCP paradigm, the efficiency hypothesis recognizes that the relationship between market structure and the performance of individual banks is explained by bank efficiency.[4] According to this hypothesis, efficient banks gain market share and this increases market concentration. As foreign entry increases market competition, domestic banks that improve their operational efficiency expand their market share and, consequently, market concentration increases. This hypothesis is supported if the performance of individual banks positively affects market shares.

Changes in financial regulations

Barajas et al. (2000) suggest that other liberalization factors should be controlled for to avoid overstating the positive effect of foreign bank entry. As Unite and Sullivan

[3] According to a provision of the Thai corporate charter, 25% of a company's outstanding shares constitutes a controlling interest (Stock Exchange of Thailand, 1997). However, a shareholder with at least 20% of the company's shares has effective control.

[4] According to the contestable-markets hypothesis, the degree of market competition cannot be measured by the market concentration ratio. According to this hypothesis, market competition is measured by how easily outsiders can enter the market. The easier it is for outsiders to enter the market, the more competitive is the market in the sense that incumbents cannot earn excessive profits.

(2003) also point out, it is important to consider the regulatory factors affecting the impact of foreign entry. When using time-series data, it is difficult to distinguish the effects of foreign bank entry from other effects of financial reforms that have taken place simultaneously or following foreign penetration.[5] In studies that focus on individual countries, the effects of foreign entry and ownership on bank performance cannot easily be disentangled from those of other concurrent financial reforms.

In the case of Thailand, this problem cannot be ignored. In Thailand, financial liberalization was introduced in 1992, whereas the entry of foreign banks increased substantially following the 1997 Asian crisis. In the context of financial liberalization, the effect of foreign bank entry is supposed to be separable from the effects of financial reforms. However, after the financial crisis, when foreign penetration increased substantially, the restructuring of domestic banks and a strengthening of prudential regulations occurred simultaneously. The influence of these financial reforms must be controlled for in the regression analysis.

3.3 Expected changes in bank performance

As in previous studies, we evaluate the impact of foreign entry on bank operations in terms of the effects on operational costs, profitability, and interest rate spreads.

As the market influence of foreign banks increases, domestic banks are forced to give up their sheltered "quiet life" and to exert greater effort to improve cost efficiency (Claessens et al. (2001), Berger and Hannan (1998)). Moreover, foreign bank entry introduces advanced techniques and skills that are expected to improve the operating efficiency of domestic banks. Therefore, in the long run, we can expect increased foreign bank presence to increase the cost efficiency of domestic banks. However, improved operational efficiency occurs gradually. Immediately after entry by foreign banks, domestic banks must invest in modernization. In the short run, as the foreign presence increases, the operational costs of domestic banks may increase.

Hypothesis 1. An increase in the foreign presence in the market or in the foreign ownership of individual banks increases the operational costs of banks in the short run. However, in the long run, it reduces banks' operational costs.

The rise in the influence of foreign banks leads to greater competition in the domestic banking sector. Banks are forced to respond to this increasing competition and, consequently, they cease to earn the excessive profits made before foreign bank entry, at least in the short run. Therefore, as Barajas et al. (1999) and Claessens et al. (2001) predict, accounting profits are expected to decline. However, the increased influence of foreign banks makes domestic banks more profit oriented and more efficient. In the long run, as they find alternative income sources to compensate for the loss of traditional banking income, the profitability of domestic banks increases again.

Hypothesis 2. An increase in the foreign presence in the market or in foreign ownership of individual banks reduces accounting profits in the short run. However, in the long run, the profitability of banks tends to increase again.

[5] In cross-country studies, it is difficult to separate the effects of foreign bank entry from the effects attributed to differences in economic and regulatory factors between countries.

Third, interest rate spreads are defined as the difference between the interest earnings ratio (interest earnings divided by total lending) and the interest expense ratio (interest expenses divided by the sum of deposits and borrowings). The interest rate spread, defined in terms of interest rate income, interest rate expenses, or both, is expected to decline immediately following a rise in foreign ownership (Barajas et al. (2000), Claessens et al. (2001), Unite and Sullivan (2003)).

Hypothesis 3. An increase in the foreign presence in the market or in foreign ownership of individual banks reduces interest rate spreads in the short run. However, in the long run, the profitability of banks tends to increase again.

4. Development of Foreign Bank Entry in the Thai Market

4.1 Development of foreign bank entry

Before conducting empirical analysis of the Thai domestic banking market in the next section, we provide a brief overview of the main features of the changes in the Thai banking market from early 1990s to 2002.

The Thai financial system changed considerably following the financial liberalization of the early 1990s. The financial liberalization measures incorporated the following elements of deregulation. In 1990, Thailand accepted the International Monetary Fund (IMF)'s Article VIII and abandoned foreign exchange controls on current account transactions. Then, in 1991, most restrictions on capital account transactions were abandoned. In 1993, to facilitate international borrowing and encourage inflows of funds, the Bangkok International Banking Facility (BIBF) was established. In 1994, regulations on outward direct investment, travel expenditure, and other channels of cross-border payments were relaxed. Along with these reforms, deregulation measures were introduced in Thai banking markets. Commercial banks were permitted to undertake new business, and finance and securities companies were allowed to engage in new forms of operation. These reforms were pursued under the presumption that financial liberalization would promote market competition and improve the Thai financial market.

However, new foreign banks play less of a role in the financial market than do domestic banks. Although the establishment of the BIBF led to increased entry by new participants from abroad, these participants were not allowed to provide a full range of financial services. The amount of lending by the BIBF and branches of foreign banks expanded dramatically and a large amount of foreign capital went into the Thai economy. Competition between Thai commercial banks and other nonbank financial institutions increased because of the liberalization measures. However, foreign penetration in the Thai banking market was limited and foreign banks were segmented from Thai domestic banks.

A significant change in the Thai financial market occurred as part of the financial restructuring program following the financial crisis of 1997. That is, the regulation on the foreign shareholding limit in Thai commercial banks was relaxed. Following the crisis, Thai authorities increased the proportion of shares that foreign investors could hold in Thai commercial banks for up to 10 years from 25% to 49%.

As a result, family ownership of Thai banks, which was dominant, significantly declined while the share of foreign ownership in domestic commercial banks gradually increased. Four of the 15 commercial banks are majority owned by foreign investors; that is, foreigners own more than 50% of the shares.[6] The rise in foreign ownership is expected to increase competition and affect domestic banks' performance, positively or negatively.

4.2 Data on the Thai banking industry

Using panel data on 17 domestic commercial banks from 1990 to 2002, below we describe key banking sector indicators to examine descriptively the effects of the foreign bank presence on domestic bank performance. **Table 1** describes the ownership of foreign banks and shows how foreign entry has evolved in the Thai banking system. Defining foreign-owned banks as those in which foreign investors own more than 50% of the total equity implies that all banks were domestically owned before the financial crisis of 1997. After the crisis, 13 of 17 banks remained domestically owned and the other four were acquired by foreign investors under the financial restructuring reforms that followed the crisis. In this sense, given the legal restrictions in place before the crisis, foreign entry only occurred from 1998. Market shares and the proportion of foreign banks increased following the crisis. However, foreign investors owned equity in some domestic banks before the financial crisis and foreign participation in some domestic banks increased substantially following the crisis.

Table 1. Evolution of Foreign Bank Entry

Table 2 presents statistics for the interest rate spreads, accounting profits, and operating expenses of the 17 domestic Thai banks for the period 1991–2002. These data highlight the following points. First, operating expenses rose substantially and, at the same time, varied widely between banks after the financial crisis. What is interesting is that the operating expenses of foreign-owned banks were clearly higher than those of domestic banks. Second, interest rate spreads fell following the crisis. As with operational expenses, the interest rate spreads of foreign-owned banks were higher than those of domestic banks. Third, profit ratios fell during the crisis period but recovered quickly along with the Thai economy. However, even in 2002, profits were substantially below their precrisis levels. Although these figures must be interpreted carefully, the profit ratios of foreign-owned banks appear lower than those of domestic banks.

Table 2. Descriptive Statistics on Selected Variables

These descriptive statistics suggest that foreign-owned banks have higher operational expenses ratios, higher interest rate spreads, and lower profit ratios than their domestic counterparts. Although these findings differ from those for central European and Latin American countries, they may reflect the fact that, in Thailand, foreign-owned banks had the disadvantage of starting their business operations by acquiring failed domestic banks.

[6] The four banks are the UOB Radanasin Bank, the Bank of Asia, the Standard Chartered Nakornthon Bank, and the DBS Thai Danu Bank.

5. Empirical Analysis

We use panel data on 17 domestic commercial banks from 1990 to 2002 to examine the effect of foreign bank presence on domestic bank performance. Balance sheet data, incomes statements, and ownership data are obtained from the I-SIMS database of the Stock Exchange of Thailand. The sample period covers the period of financial liberalization in Thailand in the first half of the 1990s and the 1997 financial crisis.

5.1 Variable definitions and estimated equations

Foreign ownership is measured as the percentage of foreign shareholders holding more than 50% of all bank stock. In 2002, four of 15 commercial banks were majority owned by foreign investors; that is, foreigners owned more than 50% of the shares. Although the common stock of the remaining domestic banks is not completely owned by foreign banks, the level of foreign ownership has increased considerably, especially since the 1997 financial crisis. The rise in foreign ownership is expected to affect domestic bank performance.[7] In addition, we control for other factors that may affect bank performance, including bank-level variables, market-structure variables, and macroeconomic variables. We investigate the effect of foreign bank presence on the operations of domestic banks. Three indicators of bank operations are the overhead expenses ratio, the profit ratio, and the interest rate spread.

Overhead expenses ratio

First, overhead expenses (***OE***) are noninterest expenses, which comprise personnel expenses, premises and equipment expenses, fees and services expenses, and other noninterest expenses. β_0 is the constant term (fixed cost). Log (***LOAN***) is the logarithm of the total amount of loans. Wages (***WAGE***) are personnel expenses per employee. ***K*** is the ratio of premises and equipment expenses to total assets. The coefficients of output, β_1, and those of input prices, β_2 and β_3, are expected to be positive. ***HI*** is the Herfindahl index, which measures the effect of changes in market structure on domestic banks. If the market-structure hypothesis is supported, β_4 is positive.[8]

CRISIS is a crisis dummy that equals 1 if t = 1997–1999 and 0 otherwise. We expect the coefficient of the crisis dummy, β_5, to be positively related to operating expenses. Banks are expected to face higher operating costs in the postcrisis period. ***DUMC*** is a financial reform policy dummy, which is equal to 1 if t = 1997–2002 and 0 otherwise. Since more stringent prudential regulations were imposed as part of the new financial reforms following the Asian crisis, we expect the coefficient of the crisis dummy, β_6, to be positively related to operating expenses. Banks are expected to face higher operating costs in the postcrisis period. In addition, we addressed the effect of government ownership by including a government dummy (***GOV***), which is equal to 1 if government owns more than 50% of the bank, and 0 otherwise.

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[7] See footnote 3.

[8] If the efficiency hypothesis is supported, the coefficient β_4 is negative. If the contestable-markets hypothesis is supported, there is no significant relationship between Herfindahl index and operating expenses.

Lastly, operating costs are expected to decline with the increase in foreign ownership, ***FOWN***. Domestic banks are forced to give up their sheltered "quiet life" and make greater efforts to improve cost efficiency (Claessens et al. (2001), Berger and Hannan (1998)). Moreover, foreign bank entry introduces advanced techniques and skills that are expected to improve the operating efficiency of domestic banks. Thus, we expect the coefficient β_8 to be negative.

$$OE_{it} = \beta_0 + \beta_1 \log(LOAN)_{it} + \beta_2 WAGE_{it} + \beta_3 K_{it} + \beta_4 HI_t + \beta_5 CRISIS_t + \beta_6 DUMC + \beta_7 GOV_{it} + \beta_8 FOWN_{it} + \varepsilon_{it} \quad (1)$$

Bank profitability

Second, we consider the effect on bank profitability of changes in foreign ownership. We use the ratio of earnings before tax to total assets as the proxy for bank's profitability (***PROFIT***). Wages (***WAGE***) are personnel expenses per employee. ***K*** is the ratio of premises and equipment expenses to total assets. ***IEX*** is the ratio of interest expenses to total deposits. Input prices are expected to be negatively related to the profit ratio. Therefore, the coefficients β_1, β_2, and β_3 should be negative. ***SPREAD*** is the difference between the ratio of interest income to total loans and the ratio of interest expenses to total deposits. Since the interest spread is the main component of a bank's profit, an increase in the interest spread increases profits, and vice versa. Hence, the coefficient β_4 is expected to be positive. ***TA*** is the total assets of the bank; its coefficient, β_5, is expected to be positive if large banks make larger profits than small banks.

If the coefficient on ***HI*** (the Herfindahl index), β_6, is positive, the market-structure hypothesis is supported.[9] Since ***CRISIS*** is expected to adversely affect a bank's profitability, the coefficient β_7 is expected to be negative. The effect of government ownership is represented by the government dummy, ***GOV***, which is equal to 1 for banks that are more than 50% owned by the government and 0 otherwise. The effect of foreign ownership (***FOWN***) on a bank's profitability is represented by the coefficient, β_{10}. Hence, this coefficient is expected to be negative in the short run and positive in the long run.

$$PROFIT_{it} = \beta_0 + \beta_1 WAGE_{it} + \beta_2 K_t + \beta_3 IEX_{it} + \beta_4 SPREAD_{it} + \beta_5 \log(TA)_{it} + \beta_6 HI_t + \beta_7 CRISIS_t + \beta_8 DUMC_{it} + \beta_9 GOV_{it} + \beta_{10} FOWN_{it} + \varepsilon_{it} \quad (2)$$

Interest rate spread

Third, the interest rate spread (***SPREAD***) is defined as the difference between the interest earnings ratio (interest earnings divided by total lending) and the interest expense ratio (interest expenses divided by the sum of deposits and loans). ***NIA*** is noninterest earnings divided by total assets. Because banks have concentrated more on noninterest

[9] If the efficiency hypothesis is supported, the coefficient β_6 is negative. If the contestable-markets hypothesis is supported, β_6 is zero.

earning assets than their traditional interest earnings, the coefficient β_1 is expected to be positive. ***FND*** is the ratio of the sum of deposits and nondeposit loans to total assets and ***OE*** is the ratio of overhead expenses to total assets. We expect a negative relationship between ***FND*** and ***SPREAD*** and a positive relationship between ***OE*** and ***SPREAD***. ***RSZ*** is relative bank size, which is defined as the bank's total assets as a percentage of total assets for all commercial banks. Since large banks are likely to acquire higher interest spreads than small banks, the coefficient β_4 is expected to be positive. Next, consider the macroeconomic variables. We include ***INF*** (defined as the percentage change in the CPI) and ***GDP*** (defined as the percentage change in real GDP). Higher inflation and higher GDP growth are expected to be associated with a higher spread. Thus, the coefficients β_5 and β_6 are expected to be positive. ***RR*** is the reserve requirements ratio. A stricter (higher) reserve requirement ratio is expected to lead to lower interest spreads by compelling banks to retain more of their equity rather than lending the funds to earn interest. Thus, the reserve requirements ratio is expected to be negatively related to the interest spread.

As we expect the effects of crisis (***CRISIS***) and financial restructuring (***DUMC***) on banks' interest spreads to be negative, β_8 and β_9 are expected to be negative. As in the cost and profit regressions, government ownership is represented by the government dummy, ***GOV***. The interest rate spread, based on interest rate income, interest rate expenses, or both, is expected to decline immediately following a rise in foreign ownership (***FOWN***) (Barajas et al. (2000), Claessens et al. (2001), Unite and Sullivan (2003)). Thus, the coefficient β_{11} is expected to be negative. The bad-debt ratio is controlled for by the inclusion of ***BADRA***, which is defined as the ratio of nonperforming loans to total assets.

$$\begin{aligned} SPREAD_{it} = {} & \beta_0 + \beta_1 NIA_{it} + \beta_2 FND_t + \beta_3 OE_{it} + \beta_4 RSZ_{it} + \beta_5 INF_t + \beta_6 GDP_t \\ & + \beta_7 RR_t + \beta_8 CRISIS_{it} + \beta_9 DUMC_t + \beta_{10} GOV_{it} + \beta_{11} FOWN_{it} \\ & + \beta_{12} BADR_{it} + \varepsilon_{it} \end{aligned} \tag{3}$$

5.2 Results

Overhead costs

As shown in **Table 3**, consistent with the cost-function theory, the coefficients of output prices (***LOAN***) and input prices are positive and most are statistically significant. First, the relationship between wages (***WAGE***) and the operating expenses ratio is positive and statistically significant. The higher are wages, the larger are overhead expenses. The coefficients of the equipment expenses ratio (***K***) are positive and most are statistically significant. The coefficients of output prices (***LOAN***) are positive but not all are statistically significant. The coefficients of output prices are less than 1, which suggests the existence of scale economies in the commercial bank market. The Herfindahl index (***HI***), which is a market-structure variable, is significantly negatively related to cost. The evidence is not consistent with the SCP hypothesis. Rather, the

evidence supports the efficiency hypothesis.[10] A highly efficient bank that provides better services increases its market share in a more highly concentrated market. Thus, such banks have higher profits and lower operating costs.

Table 3. Operating Expenses

Consider now the effects of the macroeconomic variables on banks' operating costs. The coefficient of the crisis dummy (***CRISIS***) is positive but not statistically significant. This is because, given significant changes in the amount of loans and in interest rates, the introduction of new regulations, and changes in the environment following the crisis, it is difficult to clearly ascertain the impact of the crisis on operating expenses. However, the positive sign of the crisis dummy implies that banks, in general, tended to have higher operating expenses in the aftermath of financial crisis, although the coefficient is not statistically significant. On the other hand, the financial restructuring variable (***DUMC***) is positive and significantly related to the cost ratio. This emphasizes the effect of financial restructuring on banks' operating expenses. In the postcrisis period, since numerous banks laid off employees and adopted early retirement programs (to reduce long-run personnel expenses), banks, at least in the short run, had higher personnel expenses. In addition, to compete with new foreign bank entrants, new and advanced technologies and equipment were introduced, and this led to higher initial operating expenses.

Unlike in previous studies, we find a positive and statistically significant relationship between foreign bank presence (***FOWN***) and operating costs. As shown in **Table 3**, a rise in the foreign bank presence leads to an increase in operating costs for domestic banks. This may be because the entry of foreign banks has forced domestic banks to invest in new facilities and advanced technologies. At the same time, although domestic banks have improved cost efficiency to enable them to compete in the new environment, they are still in the process of restructuring by, for example, laying off employees and making provisions for nonperforming loans. Consequently, at least in the short term, the operating costs ratio tends to increase in response to the entry of foreign banks. The effects of foreign bank entry do not change when we control for the impact of the economic environment by including the financial restructuring dummy in the regression equation.

Bank profits

According to **Table 4**, as expected, wages (***WAGE***) and interest expenses (***IEX***) are significantly negative related to before-tax profit ratios. The higher are expenses (wages and interest expenses), the lower are profits. Also as expected, the interest rate spread (***SPREAD***) is statistically significant and positively related to the profit ratio. However, the coefficient of the equipment expenses ratio (***K***) is not statistically significant. Total assets (***TA***) are significantly positively related to the profit ratio, which suggests the presence of scale economies. The results support the efficiency hypothesis. Given a more competitive market, following financial deregulation, highly efficient banks increased

[10] According to the efficiency hypothesis, the relationship between market structure and performance is determined by the efficiency of the firm. A highly efficient firm can increase its market share and this can lead to increased concentration. Consequently, overall performance is improved.

their market shares and improved their profitability. Inefficient banks were unable to compete, and their market shares and profits declined.

Table 4. Bank profits

Like in the cost function, the crisis dummy (***CRISIS***) is not statistically significant, but the effect of financial restructuring (***DUMC***) on banks' profit ratios is significantly negative. As already mentioned, the introduction of new equipment and technology, given bad debts and losses from debt restructuring, reduced profitability following the crisis.

Profit is significantly and negatively related to an increase in the foreign bank presence (***FOWN***). As already mentioned, an increase in foreign ownership increases competition in the banking market. Consequently, the market shares and profitability of banks (particularly the uncompetitive and inefficient ones) fell initially as foreign ownership increased. Consistent with the arguments of existing surveys, we suggest that, because of the introduction of new technologies and financial products (following the entry of foreign banks), expenses were incurred and thus, at least in the short term, profits declined. Including the crisis dummy or the financial restructuring dummy made no significant difference to our results.

Interest rate spread

Next, we examine the regression for the interest rate spread. We find evidence that a reduction in the noninterest earnings assets ratio (***NIA***) is associated with a decline in the interest spread. This is because banks become more conservative in their lending and search for new income sources so that they do not have to rely on traditional interest earnings. However, in a highly competitive environment, it is difficult to find new sources of income. The coefficient of the funding ratio (***FND***) is not significantly related to the interest spread. The overhead expenses ratio (***OE***) is positively related to the spread but is not statistically significant.

Table 5. Interest Rate Spread

The coefficient of ***RSZ*** indicates that relatively smaller banks have smaller interest spreads. That is, smaller banks have lower interest spreads than larger banks. Larger banks tend to be able to raise funds more cheaply than smaller banks. Hence, large banks have higher interest spreads than small banks.

Turning to the macroeconomic variables, the coefficients of the inflation rate and GDP growth are negative but not statistically significant. Because higher reserve requirements (***RR***) reduce the level of funds available for earning interest, the spread is expected to decline as ***RR*** increases. However, we find a positive relationship between interest rate spreads and the reserve requirement. Following Unite and Sullivan (2003), this may be related to the timing of changes in the reserve requirements by the Central Bank. The Bank of Thailand increases reserve requirements when bank interest rate spreads are increasing and decreases reserve requirements when bank interest rate spreads are declining.

Although we find that ***CRISIS*** has a statistically significant negative effect on interest rate spreads, we also find that financial restructuring (***DUMC***) has a statistically significant positive effect on spreads. The effect of the crisis, in the short run, may have reduced the ability of banks to obtain high interest rate spreads. Banks may have found it more difficult to gain higher interest earnings than before because of the increase in market competition. However, given the strict financial restructuring, banks might be able to gain higher spreads (either from greater interest income or from lower interest expenses) in the longer term.

We find that the presence of foreign banks (***FOWN***) has a significantly positive effect on interest rate spreads. The greater is the extent of foreign ownership of banks, the greater are the interest rate spreads of domestic banks. As in the context of the cost and profit regressions, our estimation results are essentially unaffected by the inclusion of the crisis dummy and the financial restructuring dummy. An increase in spreads can be due to either an increase in interest income, a decline in interest expenses, or both. Interest expenses may fall as the large domestic banks that remain attract the major share of deposits, particularly following the crisis, whereas new foreign banks might need more time to compete effectively in the market. Interest income increases because foreign banks tend to lend more funds to new customers in order to increase their loan portfolios, whereas domestic banks tend to lend more conservatively because of their problems with nonperforming loans.

An interesting finding is the positive effect on banks' interest spreads of the government dummy (***GOV***). Hence, government-owned banks tend to have higher interest rate spreads than private banks. The effect of the bad debt ratio (***BADRA***) on spreads is not statistically significant.

6. Conclusions

In this paper, we investigated the impact of foreign bank entry on Thai domestic banks by using panel data on 17 domestic commercial banks from 1990 to 2002. We extended the seminal work of Chantapong by enlarging the scope of study and by undertaking a more rigorous and comprehensive analysis. First, whereas Chantapong focuses on the postcrisis period (1995–2001), we examined the entire development period of foreign entry from the 1990s. Second, while Chantapong's approach to estimation is ad hoc and lacks theoretical foundations, in this paper, we estimated equations based on microeconomic analysis. Third, compared with Chantapong's study, we examined the effects of a wider range of factors affecting bank performance; we included changes in the foreign ownership of banks, change in financial regulations, and changes in market structure.

We found that an increase in foreign bank presence leads to a rise in overhead expenses, a decline in profits, and an increase in the interest rate spreads of domestic banks. In the short run, foreign bank entry is likely to negatively affect the operations of domestic banks by increasing competition. In the long run, however, the overall performance of banks is expected to improve.

In addition to increased foreign entry, we also found that market structure, represented by the market concentration ratio, affects bank performance. We also found evidence that other aspects of regulation significantly affected bank behavior. Following

the financial crisis, the introduction of more stringent financial regulations tended to increase banks' operating costs and reduced profit ratios. These results support recent studies of the Thai banking industry by Intarachote (2002) and Okuda (2004).

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Table 1. Evolution of Foreign Participation

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
BOA	n.a.	n.a.	4.2	6.4	4.3	5.8	4.6	3.6	76.5	76.4	77.6	78.8	78.8
BAY	n.a.	n.a.	n.a.	9.8	8.0	16.6	7.6	10.6	8.2	6.0	13.2	11.1	7.6
BB	n.a.	n.a.	n.a.	13.6	12.8	13.6	12.7	17.9	11.4	32.8	32.1	31.8	30.4
BBC	n.a.	n.a.	0	0	21.1	23.8	12.7	2.7	0	–	–	–	–
BMB	n.a.	n.a.	n.a.	5.8	11.0	11.5	10.7	1.3	0	0	0	0	0
BT	–	–	–	–	–	–	–	26.9	0	0	0	0	2.0
DTDB	n.a.	n.a.	n.a.	7.1	7.1	7.1	8.4	8.4	58.1	57.	56.8	58.1	55.5
FBCB	n.a.	n.a.	n.a.	2.6	19.1	20.4	22	20.8	–	–	–	–	–
KTB	n.a.	n.a.	n.a.	5.8	5.9	7.1	11.0	5.9	4.7	0	0.7	1.2	0.5
LTB	n.a.	n.a.	n.a.	n.a.	0	0	5	15.6	–	–	–	–	–
SCB	n.a.	n.a.	18.3	13.9	12.8	14.1	16	20	26.2	24.3	25.7	27.5	34.2
SCIB	n.a.	n.a.	5.5	10.9	10	17.4	16	14.8	–	–	–	–	–
SCNB	n.a.	n.a.	5.9	5.9	5.9	5.7	4.4	9.6	15.3	75	75	75	75
TFB	n.a.	n.a.	n.a.	n.a.	n.a.	14.6	16	16.4	36	15.7	34.9	33.6	30.8
TMB	n.a.	n.a.	20.3	8.9	17.5	18	16	15.2	4.6	3.6	4.6	0.9	0.7
UB	n.a.	n.a.	n.a.	n.a.	18.4	18.4	18	–	–	–	–	–	–
UOBR	–	–	–	–	0	0	5	15.6	100	75	75	75	75

(Source) The I-SIMS database of the Stock Exchange of Thailand.
(Notes) 1. BOA = Bank of Asia (ABN-AMRO); BAY = Bank of Ayudhya; BBL = Bangkok Bank; BBC = The Bangkok Bank of Commerce; BMB = Bangkok Metropolitan Bank; BT = BankThai; DTDB = The DBS Thai Danu Bank; FBCB = First Bangkok City Bank; KTB = Krung Thai Bank; LTB = The Laem Thong Bank; SCB = The Siam Commercial Bank; SCIB = The Siam City Bank; SCNB = Standard Chartered Nakornthon Bank; TFB = Thai Farmers Bank (Kasikornbank); TMB = The Thai Military Bank; UB = The Union Bank of Bangkok; UOBR = UOB Radanasin Bank.

Table 2. Descriptive Statistics on Selected Variables

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Operating Expenses Ratio													
Mean	1.50	1.96	1.64	1.59	1.64	1.54	1.52	1.96	3.05	2.90	3.50	2.25	2.10
Standard Deviation	0.31	1.61	0.42	0.39	0.42	0.39	0.33	0.58	2.22	1.06	3.88	0.73	0.97
Maximum	1.86	7.21	2.19	2.31	2.34	2.16	2.08	3.04	9.75	4.79	15.60	4.36	4.46
Minimum	0.71	0.64	0.62	0.64	0.65	0.63	0.65	0.78	1.14	1.77	1.79	1.67	0.94
Profit Ratio													
Mean	0.01	0.01	0.02	0.02	0.02	0.02	0.02	–0.02	–0.12	–0.07	–0.03	–0.01	0.00
Standard Deviation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.12	0.04	0.04	0.01	0.01
Maximum	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.01	–0.01	–0.01	0.01	0.01	0.01
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	–0.15	–0.12	–0.35	–0.17	–0.14	–0.02	–0.02
Interest Rate Spread													
Mean	0.03	0.02	0.03	0.03	0.04	0.03	0.03	0.02	–0.01	0.00	0.01	0.02	0.02
Standard Deviation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.01	0.01	0.01
Maximum	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.03	0.03	0.05
Minimum	0.01	0.01	0.01	0.01	0.02	0.01	–0.01	0.01	–0.07	–0.04	–0.01	–0.01	0.00

(Source) The I-SIMS database of the Stock Exchange of Thailand

Table 3. Operating Expenses

	1	2	3	4
Log***(LOAN)***	0.066	0.090	0.063***	0.062
	(0.381)	(0.226)	(0)	(0.393)
WAGE	1.615***	1.403***	1.329***	1.329*
	(0)	(0.001)	(0)	(0.002)
K	0.259**	0.281**	0.233**	0.193
	(0.029)	(0.018)	(0.044)	(0.106)
HI	–9.249***	–11.446***	–5.704**	–5.173***
	(0)	(0)	(0.015)	(0.027)
CRISIS	0.110		0.085	0.080
	(0.103)		(0.202)	(0.229)
DUMC			0.203***	0.226
			(0)	(0.008)
GOV				–0.000001
				(0.723)
FOWN	0.005***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.002)	(0.002)
OBS	135	135	135	134
R^2	0.947	0.946	0.949	0.950

Note: Log (***LOAN***) is the logarithm of total loans. ***WAGE*** is personnel expenses per employee. ***K*** is the ratio of premises and equipment expenses to total assets. ***HI*** is the Herfindahl index. ***CRISIS*** is a crisis dummy that equals 1 if t = 1997–1999 and 0 otherwise. ***DUMC*** is a financial restructuring dummy that equals 1 if t = 1997–2002 and 0 otherwise. ***GOV*** represents state ownership and equals 1 for banks that are more than 50% owned by government and 0 otherwise. ***FOWN*** is the percentage of foreign ownership. Values in parentheses are p-values. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

Table 4. Profit Ratio

	1	2	3	4	5
WAGE	–0.036***	–0.038***	–0.033**	–0.025*	–0.122**
	(0.006)	(0.004)	(0.016)	(0.074)	(0.031)
K	0.012	0.015	0.013	0.014	0.010
	(0.439)	(0.342)	(0.403)	(0.356)	(0.532)
IEX	–0.631***	–0.535***	–0.680***	–1.131***	–0.712***
	(0)	(0)	(0)	(0)	(0)
SPREAD	2.552***	2.531***	2.361***	1.997***	2.385***
	(0)	(0)	(0)	(0)	(0)
LOG(TA)	0.059***	0.061***	0.062***	0.062***	0.063***
	(0)	(0)	(0)	(0)	(0)
HI	0.653***	0.446	0.323	0.249	0.379
	(0.001)	(0.129)	(0.307)	(0.373)	(0.235)
CRISIS		0.011	–0.003	0.030	–0.001
		(0.329)	(0.796)	(0.132)	(0.915)
DUMC			–0.013	–0.049**	–0.018
			(0.473)	(0.033)	(0.205)
GOV					–0.0000001
					(0.836)
FOWN	–0.0005**	–0.0005**	–0.0005**	–0.0004*	–0.0004*
	(0.011)	(0.011)	(0.022)	(0.057)	(0.046)
DUMC*FOWN			–0.0004		
			(0.632)		
OBS	135	135	135	135	134
R^2	0.759	0.759	0.759	0.766	0.757

Note: The profit ratio is defined as earnings before tax divided by total assets. Log (***TA***) is the logarithm of total assets. ***WAGE*** is personnel expenses per employee. ***K*** is the ratio of premises and equipment expenses to total assets. ***IEX*** is defined as the ratio of interest expenses to total deposits. ***SPREAD*** is the difference between the ratio of interest income to total loans and the ratio of interest expenses on total deposits. ***HI*** is the Herfindahl index. ***CRISIS*** is a crisis dummy that equals 1 if t = 1997–1999 and 0 otherwise. ***DUMC*** is a financial restructuring dummy that equals 1 if t = 1997–2002 and 0 otherwise. ***GOV*** represents state ownership and equals 1 for banks that are more than 50% owned by government and 0 otherwise. ***FOWN*** is the percentage of foreign ownership. Values in parentheses are p-values. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

Table 5. Interest Spread

	1	2	3	4
NIA	0.506***	0.376**	0.348**	0.367**
	(0.001)	(0.030)	(0.040)	(0.030)
FND	0.022	0.019	0.025	0.036
	(0.357)	(0.443)	(0.309)	(0.194)
OE	0.021	0.034	0.033	0.026
	(0.713)	(0.558)	(0.551)	(0.642)
RSZ	0.105**	0.101***	0.101***	0.100**
	(0.011)	(0.004)	(0.005)	(0.006)
INF	–0.0008		–0.0008	–0.0009
	(0.371)		(0.408)	(0.357)
GDP	0.0002		0.0002	0.0001
	(0.749)		(0.683)	(0.830)
RR	2.992***	2.804***	2.889***	2.933***
	(0)	(0)	(0)	(0)
CRISIS	–0.014***	–0.018***	–0.014***	–0.014***
	(0)	(0)	(0)	(0)
DUMC	0.011**	0.014***	0.012**	0.011**
	(0.019)	(0)	(0.011)	(0.017)
GOV		–0.011***	–0.011***	–0.011***
		(0.007)	(0.007)	(0.008)
FOWN	0.0001**	0.0009*	0.00009*	0.0001**
	(0.012)	(0.081)	(0.062)	(0.044)
BADRA				–0.002
				(0.430)
NOB	135	134	135	135
R^2	0.516	0.596	0.602	0.590

The dependent variable is ***SPREAD***, which is defined as the difference between the ratio of interest income to total loans and the ratio of interest expenses on total deposits. ***NIA*** is the ratio of noninterest earnings to total assets. ***FND*** is the sum of deposit funding and nondeposit funding of total assets. ***OE*** is the ratio of overhead expenses to total assets. ***RSZ*** is relative bank size, which is defined as the assets of each bank as a percentage of total assets for all commercial banks. ***INF*** is the percentage change in the CPI. ***GDP*** is the percentage change in real GDP. ***RR*** is the reserve requirements ratio. ***CRISIS*** is a crisis dummy that equals 1 if t = 1997–1999 and 0 otherwise. ***DUMC*** is a financial restructuring dummy that equals 1 if t = 1997–2002 and 0 otherwise. ***GOV*** represents state ownership and equals 1 for banks that are more than 50% owned by government and 0 otherwise. ***FOWN*** is the percentage of foreign ownership. ***BADRA*** is the bad-debt ratio, which is defined as the ratio of bad debts to total loans. Values in parentheses are p-values. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.