

Chapter 4

Quantitative impact of foreign bank entry

Having assessed the country-specific framework in which domestic and foreign banks operate in the previous chapter, this chapter presents in the first section the model used, the hypotheses tested and their underlying rationale, the estimation technique as well as the data, and in the second section the estimation results and a discussion thereof.

4.1 Methodology

4.1.1 Regression model

The model used is based on the approach used by Denizer (2000), and Claessens et al. (1998).

First set of regressions:

Part I

$$(1) NIA_{it} = \beta_{0i} + \beta_1 \mathbf{FOI}_{it} + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

$$(2) OEA_{it} = \beta_{0i} + \beta_1 \mathbf{FOI}_{it} + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

$$(3) ROA_{it} = \beta_{0i} + \beta_1 \mathbf{FOI}_{it} + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

Part II

$$(1) NIA_{it} = \beta_{0i} + \beta_1 \mathbf{FOP}_{it} + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

$$(2) \text{OEA}_{it} = \beta_{0i} + \beta_1 \mathbf{FOP}_{it} + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

$$(3) \text{ROA}_{it} = \beta_{0i} + \beta_1 \mathbf{FOP}_{it} + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

In the first set, these variables are created for domestic-owned and foreign-owned banks incorporated in Thailand.¹ The first set is used to ask whether foreign ownership per se matters in the determination of NIA, OEA, or ROA, controlling for other factors.

Second set of regressions:

Part I

$$(1) \text{NIA}_{it} = \beta_{0i} + \beta_1 \mathbf{FNS}_t + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

$$(2) \text{OEA}_{it} = \beta_{0i} + \beta_1 \mathbf{FNS}_t + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

$$(3) \text{ROA}_{it} = \beta_{0i} + \beta_1 \mathbf{FNS}_t + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

Part II

$$(1) \text{NIA}_{it} = \beta_{0i} + \beta_1 \mathbf{FMS}_t + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

$$(2) \text{OEA}_{it} = \beta_{0i} + \beta_1 \mathbf{FMS}_t + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

$$(3) \text{ROA}_{it} = \beta_{0i} + \beta_1 \mathbf{FMS}_t + \beta_2 \mathbf{SOI}_{it} + \beta_3 \mathbf{LA}_{it} + \beta_4 \mathbf{NPL}_{it} + \beta_5 \mathbf{PLS}_{it} + \beta_6 \mathbf{DA}_{it} + \beta_7 \mathbf{CA}_{it-1} + \beta_8 \mathbf{INT}_t + \varepsilon_{it}$$

In the second set, these variables are created only for domestic-owned banks incorporated in Thailand (i.e. state-owned and domestic-owned private banks incorporated in Thailand).² The second set is used to ask how foreign bank penetration affects these banks in terms of NIA, OEA, or ROA controlling for other factors.

4.1.2 Variables and hypotheses

The variables that underlie the model are as follows³:

◆ Dependent variables (in percent):

(1) NIA_{it} = net interest income / total assets for bank i at time t

(2) OEA_{it} = overhead expenses / total assets for bank i at time t

(3) ROA_{it} = before-tax profit (including extraordinary items) / total assets for bank i at time t , and alternatively

$ROAX_{it}$ = before-tax profit (excluding extraordinary items) / total assets for bank i at time t

◆ Independent variables (in percent, except the dummy variables):

(1) FOI_{it} = foreign ownership dummy variable for bank i at time t

FOP_{it} = percentage share of foreign ownership for bank i at time t

FNS_t = number of foreign banks (defined as foreign-owned banks incorporated in Thailand) / number of total banks at time t , and alternatively

$FNSA_t$ = number of foreign banks (defined as foreign-owned banks incorporated in Thailand and branches of banks incorporated abroad) / number of total banks at time t

FMS_t = assets of foreign banks (defined as foreign-owned banks incorporated in Thailand) / assets of total banks at time t , and alternatively

$FMSA_t$ = assets of foreign banks (defined as foreign-owned banks incorporated in Thailand and branches of banks incorporated abroad) / assets of total banks at time t

- (2) SOI_{it} = state ownership dummy variable for bank i at time t
- (3) LA_{it} = liquid assets / total assets for bank i at time t
- (4) NPL_{it} = non-performing loans / total loans for bank i at time t
- (5) PLS_{it} = dummy variable to account for existing loan transfer, profit/loss sharing and/or yield maintenance schemes for bank i at time t
- (6) DA_{it} = customer deposits / total assets for bank i at time t
- (7) CA_{it-1} = capital-to-assets ratio for bank i at time t-1
- (8) INT_t = nominal interest rate at time t

(variables (2) to (8) are control variables)⁴

β_{0i} are intercepts, β_k coefficients, while ε_{it} is an error term.

Explanatory notes on the dependent variables⁵:

(1) Net interest income / total assets

Net interest income / total assets (i.e. the net interest margin) is measured by interest income⁶ minus interest expenses over total assets.⁷ The net interest margin, reflecting the profitability of a bank's interest-earning business, can also be interpreted as an indicator of the efficiency of bank intermediation and thus provides insights as to how bank customers are affected (i.e. welfare implications for depositors and borrowers).⁸

(2) Overhead expenses / total assets

Overhead expenses are personnel expenses and other non-interest expenses. The overhead expenses / total assets (i.e. the cost margin) variable reflects the bank's overhead expenses associated with its deposit and loan operations as well as any other activity, scaled by total assets, and it can be interpreted as an indicator of operating efficiency. Thus, the variable is

also a measure of the efficiency with which banks perform their main function of channeling funds from savers to investors.⁹

(3) Before-tax profit / total assets

Before-tax profit¹⁰ / total assets is a proxy for bank profitability and it can be derived from the following accounting identity: before-tax profit equals net interest income plus non-interest income minus overhead expenses minus loan loss provisioning.¹¹ As an accounting residual this variable is affected by the variables NIA and OEA. Non-interest income (e.g. fees and commissions) accounts for the fact that many banks also engage in non-lending activities, such as investment banking. Loan loss provisioning accounts for the amount charged to the income statement for general and specific provisioning for the relevant period. The variable before-tax profit / total assets indicates the productive efficiency with which a bank is employing its assets to generate revenues and it provides insights as to how bank shareholders are affected.¹² Thus, it can also be seen as an indicator of the efficiency of the banking system, as it drives a wedge between the interest rate received by savers on their deposits and the interest paid by lenders on their loans.

The variable ROAX is used to exclude extraordinary items, which has the property of eliminating some outliers.

Explanatory notes on the independent variables:

(1) Foreign ownership, percentage share of foreign ownership, and measures of foreign bank penetration

Foreign ownership

Foreign ownership is a dummy variable that takes the value of one if the bank is a foreign-owned bank incorporated in Thailand and zero otherwise. A bank incorporated in Thailand is defined to be foreign-owned, if at least 50 percent of its shares are foreign-owned, to ensure foreign control.

The coefficients of the foreign ownership dummy variable used in the first set are expected to be significant and to have a positive sign. In other words, foreign-owned banks incorporated in Thailand are expected to be more efficient than domestic-owned banks incorporated in Thailand in terms of net interest income and before-tax profit (all scaled by volume of business), because they are less likely to be subject to government interference and to engage in relationship lending, and they are likely to apply more sophisticated banking technologies, outweighing potential information disadvantages they may face. Moreover, due to their global reach and access to international capital markets, foreign-owned banks incorporated in Thailand also have a funding advantage over domestic-owned banks incorporated in Thailand. Foreign-owned banks incorporated in Thailand can be expected to be less efficient than domestic-owned banks incorporated in Thailand in terms of overhead expenses over total assets, as they have to overcome informational disadvantages (e.g. information on customers, business conditions, policy changes, and familiarization with the Thai mentality).

If foreign-owned banks incorporated in Thailand are found to be more efficient than domestic-owned banks incorporated in Thailand, this would then support the notion that there is scope for further enhancing banking sector efficiency through outright sales of domestic banks to foreign investors.

Percentage share of foreign ownership¹³

The variable accounts for the fact that foreign investors have jointly acquired substantial stakes in domestic-owned banks incorporated in Thailand.

The coefficients of the variable percentage share of foreign ownership used in the first set are expected to be significant and to have a positive sign with respect to net interest income and before-tax profit (all scaled by total assets), as increases in the percentage share of foreign ownership are expected to go hand in hand with increasing enforcement of shareholders' rights and orientation towards shareholder value. The coefficient of the variable

percentage share of foreign ownership is also expected to be significant and to have a positive sign with respect to overhead expenses over total assets, due to pressures exerted to streamline operations.

Measures of foreign bank penetration¹⁴:

- Number of foreign banks / number of total banks

The ratio of the number of foreign banks and the number of total commercial banks is the number share of foreign banks in the system. The number penetration measure is an appropriate measure if the number of domestic and foreign banks determines competitive conditions. This would be the case, if domestic-owned banks incorporated in Thailand adjust their pricing as soon as foreign entry occurs to prevent foreign entrants from capturing market share.

- Assets of foreign banks / assets of total banks

The ratio of assets of foreign banks and assets of total commercial banks is the asset share of foreign banks in the system. The asset penetration measure is appropriate, if foreign banks start to have an impact on the pricing of domestic-owned banks incorporated in Thailand only after gaining size.

“Foreign banks“ refers to foreign-owned banks incorporated in Thailand. The variables are denoted FNS and FMS respectively.

However, as there have been two entries and three exits of foreign bank branches, and as their asset share fluctuated during the period in question, in a second step, “foreign banks“ will refer to foreign-owned banks incorporated in Thailand as well as branches of banks incorporated abroad, denoted FNSA and FMSA respectively.

If the number penetration measure exceeds the asset penetration measure this would reflect that foreign banks tend to be smaller than domestic-owned banks incorporated in Thailand.

It is noteworthy that each penetration measure is a measure of actual foreign bank penetration, and thus does not capture the disciplining effects on domestic banks of potential foreign entry.

The coefficients of the measures of foreign bank penetration used in the second set are expected to be significant and to have a negative sign with respect to the variables net interest income, overhead expenses, and before-tax profit – all scaled by the volume of business. Foreign bank entry is expected to increase competition, and thus to improve the efficiency of the domestic commercial banking system. More explicitly, foreign bank entry is expected to lead to a reduction in the net interest margin (in the sense of the gap between what the ultimate saver receives and what the ultimate investor has to pay for funds), and to a reduction of before-tax profit / total assets (i.e. excessive profits associated with oligopolistic or cartelized markets are expected to eventually disappear). Foreign entry is expected to lead to a reduction in overhead expenses / total assets, which in turn would reflect a more efficient management and organizational structure.

As other factors also affect cross-bank variation in net interest income, overhead expenses, and before-tax profit, seven control variables that capture either the incentives of bank managers or the composition of a bank's business are included.

(2) State ownership

State ownership is a dummy variable that takes the value of one if the bank is owned by the government, and zero otherwise. A bank is defined to be state-owned if at least 50 percent of its shares are state-owned. This variable is intended to capture the fact that state-owned banks have frequently been subject to political interference (e.g. directed lending policies, absorption of insolvent banks), and that they benefit from government assistance (and thus implicitly enjoy funding advantages).

However, due to the extremely low asset quality of state-owned banks over most part of the period in question (as a result of the nationalization of several ailing private banks and uncertainty relating to potential legal liability under state enterprise laws of employees involved in debt restructuring and write-offs¹⁵) a negative relationship between this variable and the net interest margin is expected. As a consequence of massive restructuring needs and resulting redundancy expenses a positive relationship between this variable and the cost margin is expected. In view of the afore-mentioned, there should also be a negative relationship between this variable and before-tax profit / total assets.

(3) Liquid assets / total assets

Liquid assets comprise cash, interbank and money market items, and securities purchased under resale agreements (reverse repos). The liquid assets ratio captures the lack of propensity to lend during the period¹⁶ and accounts for the fact that liquid assets held put a wedge between deposit and loan rates. Liquid assets are usually of high quality and thus typically carry lower rates than other financial assets such as loans.

Thus, this variable should exert a negative influence on the net interest margin. As liquid assets require less monitoring than e.g. loan portfolios, a negative relationship between this variable and the cost margin is expected. Consequently, the coefficient of this variable could be positive or negative with respect to before-tax profit / total assets.

(4) Non-performing loans / total loans¹⁷

Since March 1998, a non-performing loan is defined as one which is 90 days or more overdue in payment of interest or principal. Although the Thai government enabled individual banks to set up their own AMCs to manage their bad assets, transfers to subsidiary AMCs, unlike transfers to state-owned asset management corporations such as the TAMC, do not change the bank's position since the bad assets remain on its consolidated books.¹⁸ The ratio of non-performing loans to total loans captures the size of distress.¹⁹

Consequently, this variable should negatively affect the net interest margin as interest on non-performing loans is not forthcoming. Due to more complex administrative and monitoring procedures associated with increased debt restructurings²⁰ and renegotiations, the coefficient of this variable with respect to the cost margin should be positive. The variable is expected to be negatively related to before-tax profit / total assets, primarily due to additional loan loss provisioning requirements and losses on debt restructuring.

(5) Loan transfer, profit/loss sharing and/or yield maintenance schemes

Loan transfer, profit/loss sharing and/or yield maintenance schemes is a dummy variable that takes the value of one if a bank benefits from such an agreement with the FIDF and zero otherwise.

A positive relationship between this variable and the net interest margin is expected, directly due to the decrease in risk exposure and indirectly through the freeing up of management resources to focus on new business opportunities. The relationship between this variable and the cost margin is ambiguous, as some banks continue to manage the defined asset pool, albeit against a management fee paid by the FIDF. Due to the reversal of loan loss provisions, management fee income, and yield maintenance payments (non-interest income) this variable should positively affect before-tax profit / total assets.

(6) Customer deposits / total assets

Customer funding comprises short-, medium-, long-term deposits, and foreign-currency deposits, other than interbank deposits. As funding from core deposits is associated with a large branch network, a high ratio would indicate high maintenance costs and large salary expenses. On the other hand, customer deposits are a relatively cheap source of funds compared to acquiring funds from the interbank or capital markets.²¹ A large branch network gives a bank access to customers in areas where there is little competition for deposits, and interest paid on these deposits will correspondingly be lower. As depositor flight to quality could be observed

early in the period, a high share of customer funding may also be a proxy for a high-quality bank.²²

In light of the afore-mentioned, a positive relationship between this variable and the net interest margin, the cost margin, and before-tax profit / total assets is expected. The last expectation is based on the assumption that a large branch network would not be maintained unless economically justified, although branching decisions have been subject to government restrictions as mentioned in section 3.2.3.

(7) Capital-to-assets ratio

The capital-to-assets ratio (i.e. total shareholders' equity²³ / total assets) lagged one period accounts for different levels of risk across banks, with low ratios indicating relatively risky positions. Banks with low capital-to-assets ratios tend to be more aggressive and take higher risks, expecting high returns, which, however, often fail to materialize. Banks with high capital-to-assets ratios have incentives to lend prudently and thus remain well-capitalized as they tend to face lower funding costs due to lower prospective bankruptcy costs and due to the fact that they simply need to borrow less to support a given level of assets.²⁴

Consequently, this variable is expected to exert a positive influence on the net interest margin. As well-capitalized banks are likely to devote more resources to risk management a positive relationship between this variable and the cost margin is expected. It follows from the afore-mentioned that this variable should positively affect before-tax profit / total assets.

(8) Nominal interest rate

The nominal interest rate is proxied by averaged 14-days repurchase rates, as the 14-days repurchase rate is the key policy rate set by the BOT, signaling shifts in the monetary policy stance. This variable is intended to capture differences in interest rate sensitivity. Banks with more interest rate sensitive assets than liabilities in the maturity bucket will experience lower net interest income when interest rates are falling and higher net interest income when they are rising. On the other hand, banks with more interest rate

sensitive liabilities than assets will experience higher net interest income when interest rates are falling and lower net interest income when they are rising.²⁵

Thus, the coefficient of this variable with respect to the net interest margin could be positive or negative. Hypotheses regarding the cost margin are also not obvious, depending on banks' business and product mix. Also, due to the effects of interest rate changes on the market value of assets and liabilities, the expected sign of the coefficient of this variable with respect to before-tax profit / total assets is ambiguous.

Summarizing, with respect to the first two objectives of the study, the following hypotheses are tested:

- 1st set: ownership (domestic versus foreign) of banks incorporated in Thailand matters in determining net interest income, overhead expenses, and before-tax profit (all scaled by volume of business); more explicitly: $H_0: \beta_1 = 0$, and $H_A: \beta_1 > 0$
- 2nd set: foreign bank entry affects the efficiency (measured by net interest income, overhead expenses, and before-tax profit - all scaled by volume of business) of the domestic commercial banking system; more explicitly: $H_0: \beta_1 = 0$, and $H_A: \beta_1 < 0$,

where H_0 denotes the null hypotheses, and H_A the alternative hypotheses.

Table 5 Summary of expected relationships

| | NIA | OEA | ROA | ROAX |
|-------------|-----------|-----------|-----------|-----------|
| FOI | positive | positive | positive | positive |
| FOP | positive | positive | positive | positive |
| FNS | negative | negative | negative | negative |
| FNSA | negative | negative | negative | negative |
| FMS | negative | negative | negative | negative |
| FMSA | negative | negative | negative | negative |
| SOI | negative | positive | negative | negative |
| LA | negative | negative | ambiguous | ambiguous |
| NPL | negative | positive | negative | negative |
| PLS | positive | ambiguous | positive | positive |
| DA | positive | positive | positive | positive |
| CA | positive | positive | positive | positive |
| INT | ambiguous | ambiguous | ambiguous | ambiguous |

4.1.3 Estimation technique

The dependent variables with respect to both sets are estimated one-by-one using a fixed-effects model²⁶, with N (N denotes the number of cross-section units) added dummy variables to allow for changes in the cross-section intercepts. Dummy variables to allow for changes in time-series intercepts cannot be included as some independent variables do not vary across banks at a given point in time and thus, these measures would then be collinear with the time dummies.

The main assumptions are as follows:

- $\beta_{0it} = \beta_{0i}$ for all t , and $\beta_{kit} = \beta_k$ for all i and t , $k = 1, \dots, K$
- $\varepsilon_{it} \sim N(0, \sigma^2)$,

where K denotes the number of coefficients. Under the normality assumption, the usual t-tests and F-tests can be applied, with $NT-N-K+1$, and $N+K-1$, $NT-N-K+1$ degrees of freedom respectively.

To test whether the fixed-effects model is appropriate, i.e. to test whether there are any individual effects at all, Wald tests are performed, comparing the error sum of squares associated with two estimation techniques (fixed-effects model and ordinary least squares model). If the error sum of squares changes substantially, the fixed-effects model is chosen. The test statistic to test the null hypothesis of no individual effects ($H_0: \beta_{01} = \beta_{02} = \dots = \beta_{0N}$) is:²⁷

$$F_{N-1, NT-N-K+1} = (ESS_1 - ESS_2) / (N-1) / (ESS_2) / (NT-N-K+1),$$

where ESS_1 and ESS_2 are the error sum of squares using the ordinary least squares model and the fixed effects model, respectively.²⁸ If the null hypothesis of no individual effects cannot be rejected, the ordinary least squares model is chosen ($\beta_{kit} = \beta_k$ for all i and t , $k = 0, \dots, K$), with $NT-K$ degrees of freedom.

4.1.4 Data

The data used is secondary, bank-level data for 13 commercial banks incorporated in Thailand, namely BAY, BBL, BMB, UBB/BT, KTB, SCB, SCIB, TFB, TMB, BOA, TDB/DTDB, NTB/SCNB, LTB/RSB/UOBR, for the time period 1997:2 to 2002:1, using quarterly data. The data has been compiled from the SET's Listed Company Info and the SET's information systems, R-SIMS and I-SIMS, which contain quarterly reports of individual banks. BMB's financial statements for the first quarter 2002 have been obtained from the BOT ([online] Available from: http://www.bot.or.th/bothomepage/databank/financial_institutions/npl_fi/254506/ecb.htm. [2002, June 13]) and the SET ([online] Available from: http://www.set.or.th/set/en/company/company_u2.jsp. [2002, June 13]). Data on the number and aggregate assets of branches of banks incorporated abroad, and data on the 14-days repurchase rate have been obtained from the BOT ([online] Available from: http://www.bot.or.th/bothomepage/databank/Financial_Institutions/New_Fin_Data/CB_Menu_E.htm [2002, August 06] and <http://www.bot.or.th/bot/homepage/databank/EconData/Econ&Finance/index1e.htm>. [2002, July 17]), whereas data on the percentage share of foreign ownership has been compiled by staff of the MOC on the basis of year-end declarations submitted by banks. The number of observations amounts to 260 (20*13) with respect to the first set of regressions and to 180 (20*9) with respect to the second set. A ranking of the 13 commercial banks by assets as well as the raw data and descriptive statistics can be found in Appendices III and IV respectively.

Note, that the objectivity of the data is impeded by a lack of transparency. The data is further complicated by the manifold reforms of the regulatory framework that occurred during the period in question as outlined in section 3.2. Whereas other studies²⁹ use unconsolidated financial statements to ensure consistency, in this study, both consolidated and unconsolidated financial statements are used, with unconsolidated financial statements only being referred to if consolidated financial statements are not available. Using

unconsolidated financial statements would be misleading, especially due to the establishment of subsidiary AMC's by several banks.

4.2 Estimation results

4.2.1 Differences in terms of efficiency between domestic-owned and foreign-owned banks incorporated in Thailand

The accounting variables for domestic-owned and foreign-owned banks incorporated in Thailand are presented in Table 6. Ratios are calculated for each bank, then averaged for domestic-owned and foreign-owned banks incorporated in Thailand separately on a quarterly basis, and finally averaged over the period 1997:2 to 2002:1. Corresponding graphs can be found in Appendix V.

Table 6 Accounting variables: domestic-owned versus foreign-owned banks incorporated in Thailand³⁰

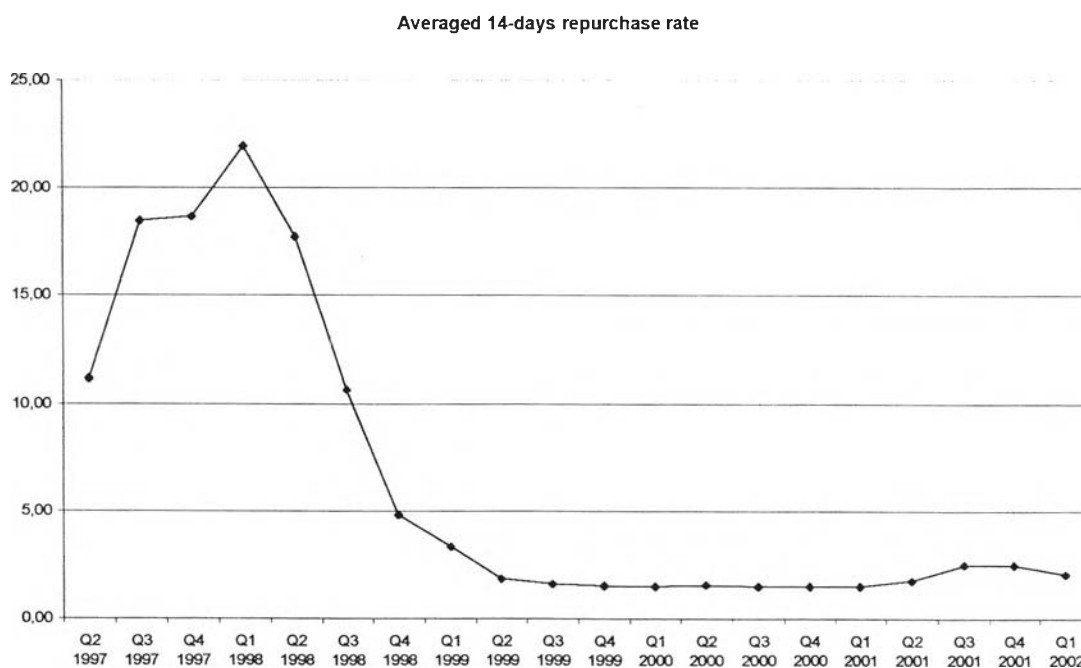
| | Domestic-owned banks incorporated in Thailand | Foreign-owned banks incorporated in Thailand |
|------|--|---|
| NIA | 0.19 | 0.31 |
| OEA | 0.66 | 0.76 |
| ROA | -0.91 | -0.67 |
| ROAX | -1.19 | -0.67 |
| LA | 15.73 | 18.04 |
| NPL | 32.91 | 26.09 |
| DA | 79.13 | 78.36 |
| CA | 4.56 | 6.41 |

The data in Table 6 show that foreign-owned banks incorporated in Thailand achieved on average higher net interest income and before-tax profit, and incurred on average higher overhead expenses, all scaled by total assets, than their domestic-owned counterparts. The non-performing loans ratio and the ratio of customer deposits over total assets were on average higher for domestic-owned banks incorporated in Thailand, the magnitude of the latter

reflecting the strong foothold of commercial banks incorporated in Thailand in the retail banking sector. On average foreign-owned banks incorporated in Thailand sustained a higher capital-to-assets ratio and recorded a higher liquid assets over total assets ratio.

Figure 6 shows the averaged 14-days repurchase rate over the period. After having reached a peak of 22 percent in the first quarter 1998, the 14-days repurchase rate fell substantially, reaching a low of 1.503 percent in the first quarter 2000.

Figure 6 Averaged 14-days repurchase rate³¹



Running the regressions with respect to the first set³² yielded the results as summarized in Tables 7 and 8. Detailed regression results, including the estimated individual dummy variable coefficients, can be found in Appendix VI.

Table 7 Estimation results: 1st set of regressions, Part I

(Panel: 13 commercial banks incorporated in Thailand, i.e. 9 domestic-owned and 4 foreign-owned commercial banks)

| | NIA (OLS) | OEA (FE) | ROA (FE) | ROAX (FE) |
|---|-----------------------|----------------------|-----------------------|-----------------------|
| FOI | 0.017 (0.095) | -0.101 (-0.565) | 0.970 (0.740) | 2.562 (2.079)** |
| SOI | -0.001 (-0.006) | -0.452 (-2.252)** | 5.375 (3.642)*** | 5.097 (3.675)*** |
| LA | -0.006 (-1.355) | 0.002 (0.534) | 0.103 (4.327)*** | 0.050 (2.246)** |
| NPL | -0.013 (-3.178)*** | 0.0004 (0.166) | -0.045 (-2.296)** | -0.042 (-2.258)** |
| PLS | -0.326 (-1.135) | -0.139 (-0.672) | 0.180 (0.119) | -0.949 (-0.664) |
| DA | 0.007 (0.913) | 0.018 (3.874)*** | -0.134 (-3.883)*** | -0.099 (-3.052)*** |
| CA(-1) | 0.047 (3.415)*** | -0.018 (-2.278)** | -0.191 (-3.273)*** | -0.093 (-1.698)* |
| INT | -0.014 (-1.328) | 0.009 (1.432) | -0.104 (-2.222)** | -0.091 (-2.074)** |
| R ² | 0.153 | 0.193 | 0.295 | 0.207 |
| F-statistic | 5.378 | 7.738 | 13.487 | 8.418 |
| WT | 0.660 | 2.455*** | 2.829*** | 2.104** |
| (t-statistics in parentheses) | | | | |
| *** 1 percent significance level ($t_c=2.576$, WT: $f_c=2.18$) | | | | |
| ** 5 percent significance level ($t_c=1.960$, WT: $f_c=1.75$) | | | | |
| * 10 percent significance level ($t_c=1.645$) | | | | |

The results show that the foreign ownership dummy variable is not related to net interest income, overhead expenses, and before-tax profit (including extraordinary items), all scaled by total assets, in a significant way, although the coefficients enter with the expected sign, except in the case of overhead expenses over total assets. This might be due to the fact that foreign-owned

banks incorporated in Thailand have introduced sophisticated managerial structures and operational processes outweighing information disadvantages.

The coefficient of the foreign ownership dummy variable, however, is significant at the 5 percent level and positive with respect to before-tax profit (excluding extraordinary items) over total assets, suggesting that foreign-owned banks incorporated in Thailand are more efficient than their domestic-owned counterparts in terms of before-tax profit (excluding extraordinary items) over total assets, as expected. The null hypothesis, $\beta_1 = 0$, is rejected. It is intuitive that the foreign ownership dummy variable is significantly related to before-tax profit (excluding extraordinary items) over total assets, but not to before-tax profit (including extraordinary items) over total assets, as only domestic-owned banks incorporated in Thailand, and especially state-owned banks, recorded substantial extraordinary (mostly income) items over the period in question.³³ Among the control variables, it is interesting that the coefficient of the state ownership dummy variable is highly significant, but enters with a positive sign, which is contrary to the expectation. It suggests that the benefits of government interference outweigh any associated disadvantages. The coefficient of the variable liquid assets over total assets is significant and positive, which might be due to the high quality of liquid assets and the low level of required loan loss provisioning. As expected, the variable non-performing loans over total loans enters with a significant and negative coefficient. Interestingly, the coefficient of customer deposits over total assets is negative and significant, suggesting that high maintenance costs and salary expenses associated with a large branch network outweigh funding advantages and that the decision to maintain a large branch network is not only based on economic reasoning as already mentioned in section 3.2.3. Contrary to the expectation, the coefficient of the lagged capital-to-assets ratio enters with a negative sign, albeit at the 10 percent significance level only, which might indicate that well-capitalized banks are more prudent and tend to have more adequate loan loss provisioning.³⁴ The nominal interest rate enters with a significant and negative coefficient, which indicates that banks had more interest rate sensitive liabilities than assets, and longer-term assets than

liabilities. Although not significant, it is interesting that the PLS dummy variable enters with a negative sign, which is counterintuitive. The R^2 of 0.207 is rather low. However, in cross-sectional studies, a low R^2 may occur also in good models, because of the large variation across individual units of observation. Performing an F-test of the null hypothesis that all the coefficients are jointly equal to zero, shows that with an F-statistic of 8.418, with 21 and 226 degrees of freedom, this hypothesis can be rejected at the 1 percent level.

Turning to Part II of the first set, the regression results are summarized in Table 8.

Table 8 Estimation results: 1st set of regressions, Part II

(Panel: 13 commercial banks incorporated in Thailand, i.e. 9 domestic-owned and 4 foreign-owned commercial banks)

| | NIA (OLS) | OEA (FE) | ROA (FE) | ROAX (OLS) |
|---|-----------------------|----------------------|-----------------------|-----------------------|
| FOP | 0.002 (0.754) | -0.0002 (-0.080) | -0.030 (-1.876)* | -0.018 (-1.476) |
| SOI | 0.081 (0.382) | -0.411 (-2.057)** | 3.802 (2.605)*** | -0.176 (-0.217) |
| LA | -0.007 (-1.438) | 0.002 (0.532) | 0.104 (4.383)*** | 0.034 (1.897)* |
| NPL | -0.013 (-3.245)*** | 8.54E-05 (0.032) | -0.048 (-2.474)** | -0.050 (-3.256)*** |
| PLS | -0.336 (-1.281) | -0.186 (-0.979) | 0.607 (0.438) | -1.018 (-1.015) |
| DA | 0.007 (0.855) | 0.018 (3.815)*** | -0.123 (-3.589)*** | -0.049 (-1.678)* |
| CA(-1) | 0.047 (3.425)*** | -0.018 (-2.258)** | -0.201 (-3.447)*** | -0.071 (-1.350) |
| INT | -0.012 (-1.077) | 0.010 (1.423) | -0.146 (-2.967)*** | -0.169 (-3.965)*** |
| R ² | 0.155 | 0.192 | 0.304 | 0.126 |
| F-statistic | 5.461 | 7.683 | 14.087 | 4.275 |
| Wald test | 0.636 | 2.422*** | 2.693*** | 1.681 |
| (t-statistics in parentheses) | | | | |
| *** 1 percent significance level ($t_c=2.576$, WT: $f_c=2.18$) | | | | |
| ** 5 percent significance level ($t_c=1.960$, WT: $f_c=1.75$) | | | | |
| * 10 percent significance level ($t_c=1.645$) | | | | |

The variable percentage share of foreign ownership is not significantly related to the net interest margin and overhead expenses over total assets, but to before-tax profit (including extraordinary items) over total assets at the 10 percent level of significance. The sign of the coefficient, however, is negative, which is contrary to the expectation. This might be due to the fact that primarily state-owned banks incorporated in Thailand, which have a low percentage share of foreign ownership, were among those recording extraordinary income items over the period in question. Once extraordinary items are excluded, the variable percentage share of foreign ownership turns out not to be significantly related to before-tax profit, although the coefficient still enters with a negative sign.

The coefficients of the control variables, except the coefficient of the PLS dummy variable, which enters with an expected positive sign, are all statistically significant. As in Part I, the state ownership dummy variable and the liquid assets over total assets variable enter with a positive sign (note, that the state ownership dummy variable enters with an expected negative, albeit insignificant coefficient with respect to before-tax profit (excluding extraordinary items) over total assets), whereas non-performing loans over total loans, customer deposits over total assets, and the nominal interest rate enter with a negative sign. Interestingly, the lagged capital-to-assets ratio again enters with a negative coefficient, suggesting that increases in the capital-to-assets ratio lagged one period go together with decreasing profitability, which is counterintuitive. Again, this might reflect that well-capitalized banks tend to be prudent and thus to maintain more adequate loan loss provisioning.³⁵ Perhaps the negative sign also partially reflects the increased issuance of CAPS and SLIPS, which are rather costly compared to common equity as explained in section 3.2.4. Whereas the capital-to-assets ratio is significantly related to before-tax profit (including extraordinary items) over total assets, it is not significant with respect to before-tax profit (excluding extraordinary items) over total assets, again underlining the importance of extraordinary items. The results have to be interpreted with caution, because the quality of the data with respect to the percentage share of foreign

ownership variable is impeded as mentioned in endnote 13. The R^2 of 0.304 is satisfying, and the F-statistic of 14.087 is significant at the 1 percent level.

The empirical findings show that foreign ownership matters in the determination of profitability, but not in the determination of the net interest margin or the cost margin. Foreign ownership of more than 50 percent, i.e. a majority stake, is positively related to before-tax profit (excluding extraordinary items) over total assets, whereas the percentage share of foreign ownership is negatively related to before-tax profit (including extraordinary items) over total assets. More explicitly:

- before-tax profits (excluding extraordinary items) over total assets of foreign-owned banks incorporated in Thailand were on average 2.56 percent higher than those of their domestic-owned counterparts, and
- a one percentage point increase (decrease) in the percentage share of foreign ownership on average decreased (increased) before-tax profits (including extraordinary items) over total assets by 0.03 percent over the period,

other variables held constant.

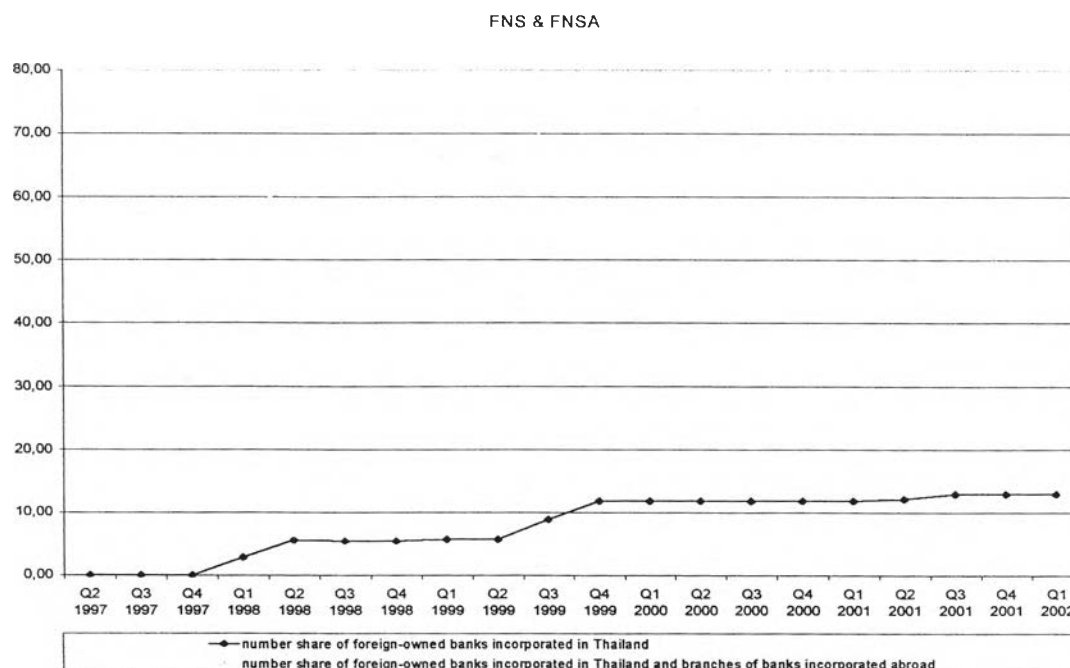
In light of the first objective of the study, the results thus support the expectation that foreign-owned banks incorporated in Thailand are more efficient than domestic-owned banks incorporated in Thailand in terms of before-tax profit (excluding extraordinary items) over total assets, and hence there seems to be scope for further enhancing banking sector efficiency through outright sales of domestic banks to foreign investors, especially since the results also suggest that a majority stake is of importance.

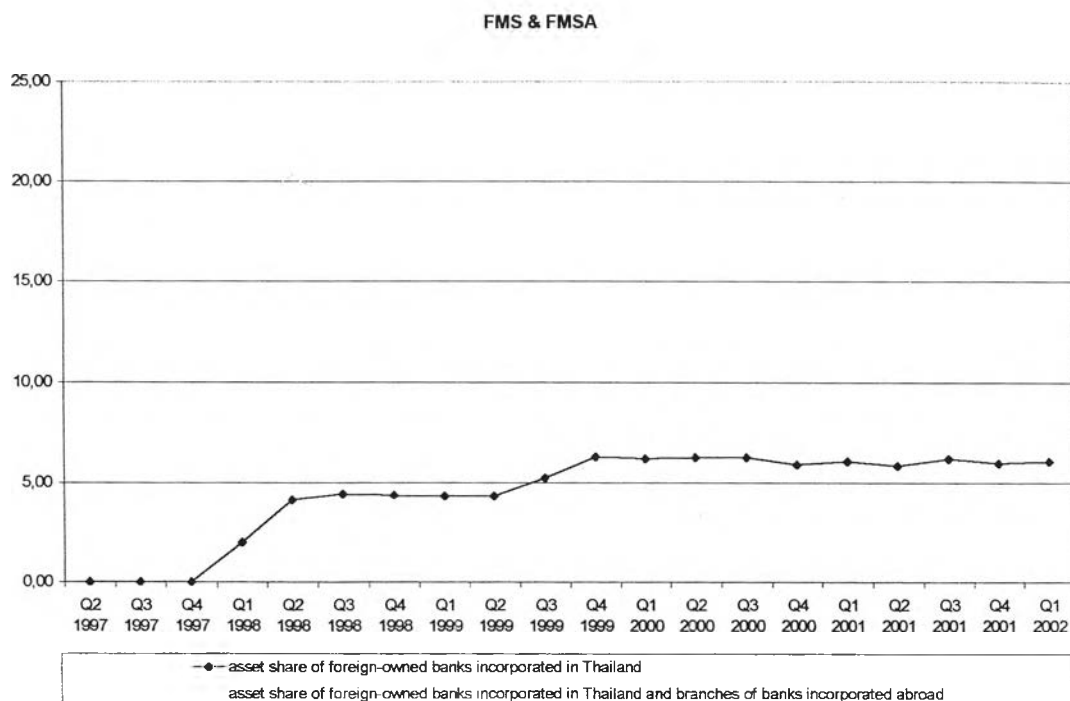
4.2.2 Effects of foreign entry on the efficiency of the domestic commercial banking system

Testing the impact of foreign bank entry on the efficiency of the domestic commercial banking sector³⁶, yields the results as summarized in tables 9, 10, 11 and 12. Detailed regression results can be found in Appendix VI.

As outlined in section 4.1.2, four different measures of foreign bank entry are used, namely FNS (number share of foreign-owned banks incorporated in Thailand), FNSA (number share of foreign-owned banks incorporated in Thailand and branches of banks incorporated abroad), FMS (asset share of foreign-owned banks incorporated in Thailand), and FMSA (asset share of foreign-owned banks incorporated in Thailand and branches of banks incorporated abroad).

Figure 7 Number and asset share of foreign banks in Thailand³⁷





As the number penetration measure exceeds the asset penetration measure, it can be inferred that foreign banks are smaller than domestic-owned banks incorporated in Thailand.³⁸ Furthermore, the figures suggest that branches of banks incorporated abroad exhibit a slight tendency to “cut and run” during crisis times. First, three branches of foreign banks were closed in 2001, namely Sakura Bank, Dresdner Bank, and Industrial Bank of Japan, although the latter two had only been granted licenses in 1996, suggesting that these branches failed to meet set targets during the crisis. Second, consolidated assets of foreign bank branches declined during the crisis, which might have been due to credit lines to domestic borrowers being cut.

Table 9 Estimation results: 2nd set of regressions, Part I

Panel: 9 domestic-owned banks incorporated in Thailand

Measure of foreign bank penetration: number share of foreign-owned banks incorporated in Thailand

| | NIA (OLS) | OEA (FE) | ROA (OLS) | ROAX (OLS) |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| FNS | -0.048 (-1.241) | 0.001 (0.099) | -0.126 (-1.087) | -0.072 (-0.759) |
| SOI | 0.412 (1.219) | -0.398 (-2.029)** | 1.719 (1.711)* | 1.581 (1.919)* |
| LA | 0.008 (0.842) | 0.004 (0.859) | 0.122 (4.233)*** | 0.013 (0.538) |
| NPL | -0.023 (-2.811)*** | 0.005 (1.449) | -0.095 (-3.938)*** | -0.077 (-3.921)*** |
| PLS | -1.131 (-1.951)* | 0.146 (0.554) | -2.769 (-1.607) | -3.051 (-2.161)** |
| DA | 0.012 (1.161) | 0.019 (4.125)*** | -0.035 (-1.146) | 0.002 (0.086) |
| CA(-1) | 0.073 (3.246)*** | -0.037 (-3.823)*** | -0.178 (-2.684)*** | 0.030 (0.548) |
| INT | -0.040 (-1.655)* | 0.023 (2.429)** | -0.195 (-2.713)*** | -0.168 (-2.853)*** |
| R ² | 0.160 | 0.334 | 0.276 | 0.170 |
| F-stat. | 3.850 | 11.010 | 7.719 | 4.142 |
| Wald test statistic | 0.125 | 3.519*** | 1.447 | 1.751 |
| (t-statistics in parentheses) | | | | |
| *** 1 percent level of significance ($t_c=2.576$, WT: $f_c=2.51$) | | | | |
| ** 5 percent level of significance ($t_c=1.960$, WT: $f_c=1.94$) | | | | |
| * 10 percent level of significance ($t_c=1.645$) | | | | |

Estimating the equations shows that the number share of foreign-owned banks incorporated in Thailand does not have a significant impact on the net interest margin, overhead expenses over total assets, or profitability. The coefficients enter with a negative sign as expected, except with respect to overhead expenses over total assets, which might be due to the fact that foreign bank entry induces domestic-owned banks incorporated in Thailand to restructure and rationalize their operations, initially resulting in higher overhead expenses.

Table 10 Estimation results: 2nd set of regressions, Part I

Panel: 9 domestic-owned banks incorporated in Thailand

Measure of foreign bank penetration: number share of foreign-owned banks incorporated in Thailand and branches of banks incorporated abroad

| | NIA (OLS) | OEA (FE) | ROA (OLS) | ROAX (OLS) |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| FNSA | -0.022 (-0.698) | -0.009 (-0.784) | 0.001 (0.013) | 0.011 (0.145) |
| SOI | 0.375 (1.108) | -0.374 (-1.932)* | 1.505 (1.493) | 1.437 (1.744)* |
| LA | 0.008 (0.864) | 0.004 (0.976) | 0.121 (4.173)*** | 0.012 (0.502) |
| NPL | -0.021 (-2.624)*** | 0.004 (1.177) | -0.086 (-3.602)*** | -0.071 (-3.666)*** |
| PLS | -1.143 (-1.946)* | 0.096 (0.359) | -2.632 (-1.508) | -2.943 (-2.062)** |
| DA | 0.010 (0.967) | 0.019 (4.378)*** | -0.043 (-1.401) | -0.002 (-0.088) |
| CA(-1) | 0.073 (3.253)*** | -0.037 (-3.842)*** | -0.172 (-2.567)** | 0.035 (0.630) |
| INT | -0.033 (-1.161) | 0.015 (1.353) | -0.132 (-1.550) | -0.124 (-1.781)* |
| R ² | 0.154 | 0.336 | 0.271 | 0.167 |
| F-stat. | 3.695 | 11.140 | 7.517 | 4.059 |
| Wald test statistic | 0.097 | 3.612*** | 1.485 | 1.753 |
| (t-statistics in parentheses) | | | | |
| *** 1 percent level of significance ($t_c=2.576$, WT: $f_c=2.51$) | | | | |
| ** 5 percent level of significance ($t_c=1.960$, WT: $f_c=1.94$) | | | | |
| * 10 percent level of significance ($t_c=1.645$) | | | | |

The estimation results do not reveal any significant impact of the number share of foreign-owned banks incorporated in Thailand and branches of banks incorporated abroad on the net interest margin, overhead expenses over total assets, or profitability. Including the branches of banks incorporated abroad interestingly results in the coefficient of the foreign penetration measure having the expected negative sign with respect to overhead expenses over total assets. However, it enters with a positive sign with respect to before-tax

profit over total assets, which is counterintuitive and contrary to the expectation. It is important to keep in mind, however, that branches of banks incorporated abroad and commercial banks incorporated in Thailand do not compete on a level playing field as outlined in Chapter 3. Most branches of banks incorporated abroad focus on wholesale banking as they have better access to foreign businesses in Thailand due to their broad customer base and network in foreign countries. Although statistically not significant, the result that increases in the number share of foreign-owned banks incorporated in Thailand *and* branches of banks incorporated abroad go together with lower net interest margin and greater profitability could be interpreted to mean that increased competition in both retail and wholesale banking forces domestic-owned banks incorporated in Thailand to develop their fee-based business (running an additional regression and regressing non-interest income over total assets on the independent variables indeed shows that the coefficient of the variable number share of foreign-owned banks incorporated in Thailand and branches of banks incorporated abroad enters with a positive sign, albeit at the 10 percent level of significance only³⁹).

Turning to Part II of the second set of regressions, the regression results are summarized in tables 11 and 12.

Table 11 Estimation results: 2nd set of regressions, Part II

Panel: 9 domestic-owned banks incorporated in Thailand

Measure of foreign bank penetration: asset share of foreign-owned banks incorporated in Thailand

| | NIA (OLS) | OEA (FE) | ROA (OLS) | ROAX (FE) |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| FMS | -0.183 (-2.120)** | 0.061 (1.841)* | -0.488 (-1.893)* | -0.576 (-2.735)*** |
| SOI | 0.388 (1.177) | -0.466 (-2.404)** | 1.661 (1.691)* | 4.994 (4.053)*** |
| LA | 0.009 (0.886) | 0.003 (0.815) | 0.123 (4.296)*** | -0.007 (-0.268) |
| NPL | -0.021 (-2.739)*** | 0.006 (1.688)* | -0.090 (-3.975)*** | -0.055 (-2.602)*** |
| PLS | -1.094 (-1.908)* | 0.148 (0.576) | -2.674 (-1.567) | -1.227 (-0.750) |
| DA | 0.015 (1.465) | 0.016 (3.628)*** | -0.027 (-0.854) | 0.010 (0.365) |
| CA(-1) | 0.073 (3.327)*** | -0.037 (-3.864)*** | -0.176 (-2.680)*** | 0.002 (0.031) |
| INT | -0.056 (-2.359)** | 0.035 (3.903)*** | -0.239 (-3.386)*** | -0.198 (-3.471)*** |
| R ² | 0.175 | 0.348 | 0.286 | 0.271 |
| F-stat. | 4.286 | 11.734 | 8.131 | 8.183 |
| Wald test statistic | 0.143 | 3.474*** | 1.702 | 2.274** |
| (t-statistics in parentheses) | | | | |
| *** 1 percent level of significance ($t_c=2.576$, WT: $f_c=2.51$) | | | | |
| ** 5 percent level of significance ($t_c=1.960$, WT: $f_c=1.94$) | | | | |
| * 10 percent level of significance ($t_c=1.645$) | | | | |

Estimating the equations indicates that the asset share of foreign-owned banks incorporated in Thailand is significantly related to all efficiency measures. As expected, increases in the asset share of foreign-owned banks

incorporated in Thailand reduce the net interest margin in the domestic commercial banking system and also domestic bank profitability. Contrary to the expectation, the asset share of foreign-owned banks incorporated in Thailand enters with a positive, but less significant coefficient, with respect to overhead expenses over total assets. The positive relationship, might be an indicator of the pressures exerted on domestic banks to restructure their operations, which initially leads to higher overhead expenses. As outlined in Chapter 5, restructuring of operations primarily entails organizational overhaul, new product development, downsizing staff and branches, equipment and technology procurement, branch modernization, and spending on public relations campaigns.

Turning to control variables, in line with the expectations, non-performing-loans over total loans is significantly and negatively related to the net interest margin, as interest on non-performing loans is not forthcoming. Interestingly, the PLS dummy variable enters with a significant (although at the 10 percent level only), but negative coefficient, which is counterintuitive, as it suggests that the existence of loan transfer, profit/loss sharing and/or yield maintenance schemes leads to a narrowing of the net interest margin. The lagged capital-to-assets ratio is positively related to the net interest margin as expected. Well-capitalized banks tend to lend more prudently, face lower funding costs, and need to borrow less to support a given level of assets. The nominal interest rate enters with a negative sign, indicating that banks had more interest rate sensitive liabilities than assets. The remaining control variables, namely customer deposits over total assets, the state ownership dummy variable, and liquid assets over total assets are not significantly related to the net interest margin and the coefficients of the latter two variables do not have the expected sign. The R^2 of 0.175 is rather low, whereas the F-statistic of 4.286 is significant at the 1 percent level.

Contrary to the expectation, the state ownership dummy variable is significantly and negatively related to overhead expenses over total assets, which might indicate that state-owned banks restructure to a lesser extent than assumed. Non-performing loans over total loans with respect to the cost

margin enters with a positive and significant coefficient as expected (albeit at the 10 percent level only) which is due to the fact that non-performing loans need to be renegotiated and restructured and thus require more complex administrative procedures. As expected, there is a significant and positive relationship between customer deposits over total assets and overhead expenses over total assets, due to high maintenance and salary expenses associated with a large branch network. Interestingly, the lagged capital-to-assets ratio is significantly and negatively related to the cost margin, probably suggesting that well-capitalized banks have a more efficient organizational structure. The nominal interest rate enters with a positive and significant coefficient. The PLS dummy variable and the variable liquid assets over total assets are neither significantly related to the cost margin, nor does the latter enter with the expected sign. The R^2 of 0.348 is satisfying and the F-statistic of 11.734 is significant at the 1 percent level.

The results show a positive and significant relationship between the state-ownership dummy variable and before-tax profit (including extraordinary items) over total assets (albeit at the 10 percent level of significance only), again indicating that the benefits from government interference outweigh any disadvantages. The liquid assets over total assets ratio with respect to before-tax profit (including extraordinary items) over total assets enters with a positive and highly significant coefficient, which might be an indicator for lower associated loan loss provisioning requirements. As expected non-performing loans over total loans and before-tax profit (including extraordinary items) over total assets are significantly and negatively related, which is due to the loss in interest income, high overhead expenses, and high loan loss provisioning requirements associated with non-performing loans. The lagged capital-to-assets ratio enters with a negative sign, which is counterintuitive. This might be due to (i) the fact that primarily (low-capitalized) state-owned banks recorded extraordinary income items, especially since the variable enters with a positive, albeit insignificant coefficient with respect to before-tax profit (excluding extraordinary items) over total assets, and (ii) well-capitalized banks being more prudent and thus maintaining more adequate loan loss

provisioning.⁴⁰ The nominal interest rate and before-tax profit (including extraordinary items) over total assets are significantly and negatively related, which indicates that domestic-owned banks incorporated in Thailand had more interest rate sensitive liabilities than assets, and longer-term assets than liabilities. The variable customer deposits over total assets and the PLS dummy variable are neither significantly related to before-tax profit (including extraordinary items) over total assets, nor do they have the expected sign. The R^2 of 0.286 is rather low, but the F-statistic of 8.131 is significant at the 1 percent level.

The results also show a significant and positive relationship between the state ownership dummy variable and before-tax profit (excluding extraordinary items) over total assets. As expected, non-performing loans over total loans is significantly and negatively related to before-tax profit (excluding extraordinary items) over total assets. The nominal interest rate enters with a significant and negative coefficient, which again indicates that domestic-owned banks incorporated in Thailand had more interest rate sensitive liabilities than assets, and longer-term assets than liabilities. The remaining control variables are not significantly associated with before-tax profit (excluding extraordinary items) over total assets. The R^2 of 0.271 is rather low, but the F-statistic of 8.183 is significant at the 1 percent level.

Table 12 Estimation results: 2nd set of regressions, Part II

Panel: 9 domestic-owned banks incorporated in Thailand

Measure of foreign bank penetration: asset share of foreign-owned banks incorporated in Thailand and branches of banks incorporated abroad

| | NIA (OLS) | OEA (FE) | ROA (OLS) | ROAX (OLS) |
|--|----------------------|-----------------------|-----------------------|-----------------------|
| FMSA | -0.126 (-1.247) | 0.048 (1.257) | -0.637 (-2.135)** | -0.555 (-2.277)** |
| SOI | 0.355 (1.069) | -0.409 (-2.137)** | 1.631 (1.668)* | 1.567 (1.964)** |
| LA | 0.009 (0.913) | 0.003 (0.714) | 0.126 (4.416)*** | 0.017 (0.718) |
| NPL | -0.020 (-2.571)** | 0.005 (1.623) | -0.087 (-3.889)*** | -0.073 (-4.010)*** |
| PLS | -1.140 (-1.964)** | 0.182 (0.698) | -2.937 (-1.721)* | -3.237 (-2.323)** |
| DA | 0.011 (1.100) | 0.018 (4.001)*** | -0.033 (-1.074) | 0.007 (0.276) |
| CA(-1) | 0.076 (3.423)*** | -0.038 (-3.937)*** | -0.166 (-2.528)** | 0.039 (0.726) |
| INT | -0.011 (-0.730) | 0.021 (3.365)*** | -0.108 (-2.420)** | -0.111 (-3.048)*** |
| R ² | 0.160 | 0.340 | 0.291 | 0.193 |
| F-stat. | 3.852 | 11.347 | 8.298 | 4.834 |
| WT | 0.101 | 3.429*** | 1.463 | 1.787 |
| (t-statistics in parentheses) | | | | |
| *** 1 percent level of significance ($t_c=2.576$, WT: $f_c=2.51$) | | | | |
| ** 5 percent level of significance ($t_c=1.960$, WT: $f_c=1.94$) | | | | |
| * 10 percent level of significance ($t_c=1.645$) | | | | |

Estimating the equations shows that the asset share of foreign-owned banks incorporated in Thailand and branches of banks incorporated abroad is significantly and negatively related to profitability at the 5 percent level of significance, but it is neither significantly related to the net interest margin, nor to the cost margin. The decrease in significance underlines the fact that branches of banks incorporated abroad and domestic-owned banks incorporated in Thailand do neither compete in the same lines of business nor on a level playing field.

Among the control variables, the state ownership dummy variable enters with a significant and positive sign, indicating that benefits from government interference outweigh associated disadvantages. Whereas liquid assets over total assets is significantly and positively related to before-tax profits (including extraordinary items) over total assets, the coefficient enters with an insignificant coefficient with respect to before-tax profits (excluding extraordinary items) over total assets, which might be due to the fact that state-owned banks maintained a high level of liquid assets, and the fact that also state-owned banks recorded extraordinary income items over the period in question. As expected, non-performing loans over total loans and profitability are significantly and negatively associated. The PLS dummy variable enters with a significant, but negative coefficient, which is contrary to the expectation and counterintuitive. Contrary to the expectation, the lagged capital-to-assets ratio is significantly and negatively related to before-tax profit (including extraordinary items) over total assets. Interestingly, it enters with a positive, but insignificant coefficient, with respect to before-tax profit (excluding extraordinary items) over total assets. Again, the reason might be (i) that mostly state-owned banks recorded extraordinary income items, some of which experienced low or even negative capital-to-assets ratios over the period in question, and (ii) that well-capitalized banks tend to be more prudent in terms of loan loss provisioning.⁴¹ The nominal interest rate enters with a significant and negative coefficient with respect to profitability. Customer deposits over total assets is not significantly related to profitability. The R^2 of 0.291 and 0.193 respectively are rather low, but the F-statistics of 8.298 and 4.834 are significant at the 1 percent level.

Summarizing, the findings show that⁴²

- (1) each 1 percentage point increase (decrease) in the asset share of foreign-owned banks incorporated in Thailand on average:
- decreased (increased) the net interest margin in the domestic commercial banking system by 0.183 percent
 - decreased (increased) profitability in the domestic commercial banking system by 0.488 (ROA) or 0.576 (ROAX) percent
 - increased (decreased) the cost margin in the domestic commercial banking system by 0.061 percent, whereas
- (2) each 1 percentage point increase (decrease) in the asset share of foreign-owned banks incorporated in Thailand and branches of banks incorporated abroad reduced (increased) profitability in the domestic commercial banking system by approximately 0.6 percent (ROA: 0.637 percent, ROAX: 0.555 percent),

other variables held constant.

From this, it can be inferred that the size of foreign banks rather than their number determines competitive conditions in the domestic commercial banking sector. The results further suggest that foreign entry through the acquisition of local banks has a stronger impact on the efficiency of the domestic commercial banking system than through the establishment of branches.

The results are interpreted to mean that foreign bank entry leads to greater efficiency in the Thai domestic commercial banking sector. In general, high net interest margins and excessive profits reflect the absence of competition. Thus, the narrowing of net interest margins, i.e. the gap between what the ultimate saver receives and what the ultimate investor has to pay for funds, reflects greater competition in the domestic commercial banking sector, with positive welfare implications for depositors and borrowers. Decreases in

domestic bank profitability indicate the elimination of excessive profits associated with oligopolistic markets, negatively affecting bank owners. High cost margins may reflect less efficient management and organizational structures. However, given the relatively short period of time elapsed since the easing of ownership restrictions on equity participation in Thailand, increases in cost margins could also reflect rationalization and restructuring efforts due to pressures exerted by foreign banks, which initially translate into higher overhead expenses.