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Efficiency of foreign banks: Evidence from selected (Association of Southeast Asian Nations) ASEAN countries

Sok-Gee Chan[1]* and Mohd Zaini Abd Karim[2]

[1]Institute of China Studies, Universiti of Malaya, 50603 Kuala Lumpur, Malaysia.
[2]College of Arts and Sciences, Universiti Utara Malaysia, 06010 Sintok Kedah, Malaysia.

This study examined foreign banks efficiency in selected ASEAN countries (Indonesia, Malaysia, the Philippines, and Thailand) for the period of 2001 to 2008 by using the parametric stochastic frontier analysis (SFA) approach. The results indicate that foreign banks originating from developed countries are more cost and profit efficient as compared to foreign banks from developing countries. The results also show that foreign banks in Malaysia are the most cost and profit efficient while foreign banks in Indonesia are the least. The result is consistent with the difference in index of economic freedom over the years between the countries studied. Hence, to attract foreign banks into the ASEAN countries, authorities should liberalize their banking sector. Less restrictive banking sector will allow healthy competition between foreign and local banks in the developing countries resulting in higher overall banking industry efficiency.

Key words: Bank efficiency, foreign bank, stochastic frontier, tobit regression, Association of Southeast Asian Nations (ASEAN).

INTRODUCTION

The number of foreign banks in the ASEAN countries has expanded dramatically during the past decades due to worldwide financial globalization and liberalization. Financial liberalization contributes to significant shift in economic policy arising in international agreements which increased international capital mobility (Lim, 2004). This can be seen in a massive flow of capital into the emerging markets. In the past, the primary aim of multinational banking is for defensive expansion whereby banks follow their customers abroad to provide financing services to multinational firms. Today, foreign banks are encouraged to operate in emerging markets, partly, as a way to develop a more resilient financial system in the host country through advancement in terms of resource allocation, risk management, and corporate governance. Undeniably, foreign banks (particularly from the developed countries) in the emerging markets such as in the Asian region provide technology spillovers into the banking system of the host countries.

Nevertheless there are concerns on foreign banks efficiency in the emerging markets especially when they decide on their expansion strategy. This is due to the constraints imposed on expansion policies as these banking markets are characterized with tight rules and regulations. This might lead to increase in the cost of operations and thus, prevent foreign banks to operate more efficiently.

As pointed out by Hymer (1976), foreign firms might face competitive disadvantages as compared to domestic firms because domestic firms have better access to information of the host countries in terms of the country's economy, language, law and politics. This is because the distance in terms of location and culture between the parent company and its local subsidiaries lead to less reliable accounting information from the borrowers. This eventually leads to asymmetric information problem and difficulties of the foreign banks' in designing policies to

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*Corresponding author. E-mail: sokgee@um.edu.my. Tel: 603-79565663. Fax: 603-79565114

improve their performance in the developing countries. Lensink et al. (2008) argued that foreign banks might suffer from bad institutional framework which is prominent in the less developed financial system. This is supported by Mian (2006) in highlighting the issues of higher informational, agency, and enforcement costs due to the effect of institutional distance.

Notwithstanding a large recent literature on foreign bank efficiency, relatively little attention has been paid to comparing foreign banks efficiency across countries and the influence of foreign banks country of origin on efficiency. Hence, this study examines the efficiency of foreign banks in selected ASEAN countries. By doing so, the study can also determine whether there are differences in efficiency level among foreign banks across ASEAN countries and whether foreign bank's country of origin has any influence on efficiency.

The importance of foreign banks to the host country

The role played by foreign banks in the emerging markets is undeniably important as it brings in new technology especially in terms of innovation in financial products and risk management practices (Levine, 1996; Detragiache et al., 2006; Sturm and Williams, 2008). This enables them to provide better quality, pricing and more variety of products and services as compared to the domestic banking in the host country (Dages et al. 2000; Detragiache and Gupta, 2004). From risk management perspective, the technology brought by the foreign banks allow for greater diversification of exposures as more products are being introduced to the local market.

Apart from that, the entry of foreign banks into the emerging economies will insert more competitive pressure to the domestic financial institutions and thus, indirectly boost the efficiency of domestic banks. Furthermore, the utilization of modern technology and human capital from the parents companies indirectly improve banking practices and hence, efficiency in the host country as the domestic banks is exposed to the use of modern technology and expertise from a more developed banking system.

Foreign banks entry also provides alternative funding to the host country as it enables firms in the host country, access to international capital (Moreno and Villar, 2006). Consequently, foreign banks allow for wider and cheaper access of business funding which will eventually attract more clients (Dages et al., 2000; Hawkins and Mihatjek, 2001; Bonin et al., 2005). As pointed out by Moreno and Villar (2006) and Detragiache et al. (2006), foreign bank entry helps the host country to recapitalize their banking system especially after an economic shock as the foreign banks are backed by their parent banks and their accessibility to international financial markets. Besides that, foreign banks are able to diversify against country-specific risks across different geographical regions and hence, they are less sensitive to the host countries

economic cycles (Moreno and Villar, 2006). As highlighted by Kroszner (1998), foreign banks contribute to the improvement of banking practices in the emerging markets as they are less politically connected in their lending activities.

Foreign entry into the local banking market also contributes to a better corporate governance practices. This is especially true when there are foreign shareholdings in the domestic banks as their foreign counterparts require more transparency in their reporting. This will contribute towards more transparent corporate practices in the domestic banks and finally, contribute to increase efficiency in the overall banking industry in the host countries.

LITERATURE REVIEW

The analysis of foreign bank efficiency in the host countries mainly focuses on comparison between domestic and foreign banks. Fries and Taci (2005) analyzed cost efficiency of 289 banks in fifteen East European countries for the period of 1994 to 2001. They found that foreign ownership contributes to the improvement in banks cost efficiency. Besides that, state-owned banks were found to be the least cost efficient. Bonin et al. (2005) found similar results in their study on the impact of foreign ownership on banks efficiency in eleven transition countries. Their results suggest that foreign-owned banks are more cost efficient as they are able to provide better services with the aid of their strategic foreign owners.

Kraft et al. (2006) compare the efficiency between state-owned, private, and foreign banks in Croatia. Their results show that reputable foreign banks were able to exploit their expertise and consequently, more efficient as compared to state-owned and domestic banks.

Using data from 340 banks in 40 African countries as the sample, Figueira et al. (2006) examined the relationship between performance and ownership structure. They found evidence of foreign-owned banks superior efficiency compared to domestically-owned banks.

Nevertheless, there are results that show otherwise. Yao and Jiang (2007) in their analysis of technical efficiency of Chinese banks found that foreign banks in the Chinese markets seem to exhibit lower efficiency as compared to state-owned banks. Lensink et al. (2008) also found similar result. They argue that foreign banks are less efficient than domestic banks due to the institutional distance between the host and home country. Sturm and Williams (2008) found that increase in domestic market incumbency, reduce foreign banks efficiency level. However, they also argue that banks from home countries which are more financially sophisticated will be able to take advantage of the economic environment in the host country market and result in higher level of efficiency.

One could not ignore the impact of foreign banks on the domestic banking industry. Claessens et al. (2001) studied

the difference in performance between domestic and foreign banks. They found that while foreign bank entry reduces profitability, they also reduce overhead expenses of domestic banks. In other words, the entrance of foreign banks resulted in improvement in cost efficiency level of domestic banks. This is supported by Boubakri et al. (2005) in their analysis on profitability, economic efficiency, risk taking behavior and capital adequacy of newly privatized banks after controlling for ownership structure. Their results show that foreign banks' entry benefited domestic banking industry by bringing in sound bank's risk management strategy.

METHODOLOGY AND DATA

Cost efficiency deals with the basic economic concept of firm's cost minimization in the production of output. A cost efficient firm is said to operate at the costs near the "best practice" or the least cost firm. Clark and Siems, (2002) and Berger et al. (1997) states that the cost function of bank includes prices of the input vectors, quantities of outputs, and any fixed input or output that is needed for banking operation including environmental factors and random error that affect the bank's costs.

On the other hand, profit efficiency is a wider concept as compared to cost efficiency as it takes into consideration both costs and revenues in the analysis of efficiency. In the profit generation process, banks are not only required to control their operation cost, but also to decide on their pricing strategy in order to generate more revenue.

The two concepts being used in estimating profit efficiency are the standard profit and alternative profit. The standard profit function takes output prices as given while the banks are allowed to determine their output and input quantities in order to maximize profit. On the other hand, alternative profit function takes output quantities as given, but banks can have some market power to determine the market price of their products in the profit maximization process (Pulley and Humphrey, 1993; Berger et al., 1996). This study utilize the concept of alternative profit concept as it is believed that banks in Malaysia have, to some extent, market power, in setting price of financial services and products.

This study employs the parametric stochastic frontier approach (SFA) proposed by Aigner et al. (1977), Meeusen and van den Broeck (1977) in estimating the banks cost and profit efficiency. The cost and profit function is defined as a function of vector of outputs produced by the banks, vector of input prices, and a set of control variables. The general cost and profit specification are given thus:

$$\mathrm{TC}_{kt} \text{ or } \pi_{kt} = \mathrm{f}(\mathrm{P}_{kt}, \mathrm{Y}_{kt}, \mathrm{Z}_{kt}) + \varepsilon_{kt}$$ (1)

where: TC_{kt} = operating and financial costs for bank k at time t; π_{kt} = profit for bank k at time t; P_{kt} = vector of input prices for bank k at time t; Y_{kt} = vector of outputs for bank k at time t; Z_{kt} = inefficiency term is negative for profit efficiency and the profit control variables which affect the cost or profit function for bank k attime t; $\varepsilon_{kt} = \mathrm{v}_{kt} + \mathrm{u}_{kt}$ error term in SFA.

The error terms in SFA can be divided into two components; the non-negative random variables (u_{kt}) and random error term (V_{kt}).

u_{kt} captures the production inefficiency in relation to the frontier.

On the other hand, v_{kt} is defined as the measurement error, statistical noise, and random shocks which cannot be controlled by the firms (Williams and Nguyen, 2005).

Translog cost and profit function is used in estimating cost and profit efficiency scores. This function is more flexible as it allows for multiple output technology without violating curvature conditions (Guala, 2002). In addition, the translog function also avoid the drawbacks of both CES and Cobb-Douglas production function which assume monotonically increasing or decreasing average cost curve (Murray and White, 1983). The multiple translog specification is shown in Equation 2 which is presented thus:

$$\ln TC_{kt} = \alpha_0 + \sum_{i=1}^{3} \alpha_i \ln Q_{ikt} + \frac{1}{2} \sum_{i=1}^{3} \sum_{j=1}^{3} \alpha_{ij} \ln Q_{ikt} \ln Q_{jkt}$$

$$+ \sum_{i=1}^{3} \sum_{i=1}^{3} \phi_{ij} \ln Q_{ikt} \ln P_{jkt} + v_{kt} + u_{kt}$$

$$+ \sum_{i=1}^{3} \beta_i \ln P_{ikt} + \frac{1}{2} \sum_{i=1}^{3} \sum_{j=1}^{3} \beta_{ij} \ln P_{ikt} \ln P_{jkt}$$

(2)

where: TC_{kt} = overall costs of banking include operating costs plus interest costs of bank k at time t (t=1,2,...T); Q_{ikt} = outputs i (i=1,2,3) of bank k at time t; P_{ikt} = input prices for input factor i (i=1,2,3) of bank k at time t; v_{kt} = random error idd and $N(0, \sigma_v^2)$; u_{kt} = non-negative random variables i.i.d with truncations at zero on $N(u, \sigma_u^2)$ distribution.

The standard symmetry of input prices and outputs vectors are imposed by setting $\alpha_{ij} = \alpha_{ji}$ and $\beta_{ij} = \beta_{ji}$. Next, restrictions for homogeneity of input prices are imposed by setting $\sum_{i=1}^{n} \beta_i = 1$, $\sum_{i=1}^{n} \beta_{ij} = 0$, and $\sum_{i=1}^{n} \phi_{ij} = 0$. The cost efficiency is defined as $\frac{u_{\min}}{u_i}$ where $u_{\min}$ is the inefficiency associated with the best practice banks and u_i is defined as the inefficiency of ith bank. The inefficiency scores can be obtained by $\{E[\exp(u_{kt})|\varepsilon_{kt}]\}^{-1}$.

Profit before taxes is employed in the estimation of profit functions as it closely represents the operating profit of banks. To avoid a negative profit, a constant is added into the profit model. In this context, the dependent variable for the profit function is defined as $\ln(\pi + |\pi^{\min}| + 1)$ where $|\pi^{\min}|$ is the absolute value of minimum profits, Π. The profit efficiency is defined as $\frac{u_i}{u_{\max}}$ where $u_{\max}$ is defined as the inefficiency associated with the best practice banks and u_i is defined as the inefficiency of ith bank. Hence, the sign of efficiency scores can be calculated by $E[\exp(-u_{kt})|\varepsilon_{kt}]$.

To further analyze the inefficiency effects of u_{kt} changed with time, the time-varying inefficiencies as in Battese and Coelli (1992) model is used and is presented thus:

$$u_{kt} = \{\exp[-\eta(t-T)]\}u_k \quad (3)$$

η is the parameter to be estimated and it will determine whether inefficiencies are time-varying or time-invariant; and u_{kt} is assumed to be i.i.d with truncations at zero of the $N(u, \sigma_u^2)$ distribution. If $\eta > 0$, then $-\eta(t-T) = \eta(T-t)$ is positive for $t < T$ and hence, $\exp[-\eta(t-T)] > 1$ that is cost or profit inefficiency decline over time. If $\eta = 0$, then cost and profit inefficiency is said to remain constant. On the other hand, if $\eta < 0$, then $-\eta(t-T) < 0$, this shows that cost and profit inefficiency of the foreign banks increase over time. The time-varying effect is important due to reason that foreign banks might take a longer time-span to realize their efficiency level in the host countries.

This study adopts the value-added approach proposed by Berger and Humphrey (1992) in determining the inputs and outputs vector of the banks. This approach treats deposits as outputs as it provides transaction and safekeeping services (Dietsch and Lozano-Vivas, 2000). Using this approach, three input vectors employed in this study are labor, physical capital and loanable funds which includes fund from deposits and also banks borrowing used in financing the creation of outputs. The price of labor is computed by dividing total personnel expenses with total assets of the banks. On the other hand, the price of physical capital is computed by dividing cost of capital, which is depreciation on fixed assets, with total fixed assets. The price of loanable funds is calculated by dividing total interest expenses incurred in deposits taking and borrowed funds with total loanable funds.

The three outputs vector specified in this study are total loans, total loanable funds that consist of deposits and other borrowed fund and other earning assets that represent the investment portion of the banks. Total cost of banks on the other hand, is obtained by adding up total operating costs and total interest expenses, whereas profit before tax can be obtained directly from the banks' annual reports. All outputs vectors, total costs and profit before taxes value are in USD million.

The sample of this study consist of 54 foreign commercial banks in four countries in the ASEAN region, which are, Malaysia, Indonesia, Philippines, and Thailand for the period of 2001 to 2007. The unbalanced panel data approach is used for the analysis with 327 numbers of observations. All data were obtained from the bank's annual reports in Bankscope.

RESULTS AND DISCUSSION

Table 1 presents the result of the maximum likelihood estimation of the cost efficiency equation using the Battese and Coelli (1992) model. The result is consistent with theory where total cost of commercial banks is positively related with price of inputs. The coefficient of price of labour is positively significant at the 1% level indicating that as the price of labour increase, total costs increase significantly. Eta (η) is positive indicating that foreign banks experience increase in cost efficiency over time (decrease in cost inefficiency). However, the reduction

in cost inefficiency is not significant.

Table 2 present the results of the maximum likelihood estimation of the stochastic profit frontier equation. The results of the estimation are consistent with theory, where the price of inputs is negatively correlated with profit. This holds as price of inputs increase, banks have to incur higher costs for acquiring factors of production and therefore, resulted in lower profits. In addition, Eta (η) is found to be positive and again, this shows that profit efficiency improve overtime (decrease in profit inefficiency). Nevertheless, the improvement in profit efficiency is not significant.

To further analyze the foreign banks efficiency in ASEAN, descriptive statistics are computed and presented in Table 3. Results in Table 3 show that foreign banks in ASEAN are more profit efficient, rather than cost efficient with an average profit efficiency of 76.57%. This means that banks could have increased 23.43% of their profit at the given level of output. In addition, the average cost efficiency scores of 75.90% indicate that foreign banks wasted 24.10% of the inputs in producing output. The results also indicate that the standard deviation is higher for cost efficiency compared to profit efficiency. This means that the variation in cost efficiency is higher as compared to profit efficiency. Results also show that the lowest value of cost efficiency scores is 5.84%.

Next, this study further analyze whether there are significant difference in efficiency scores between foreign banks originated from developed and foreign banks originated from developing countries by using two-sample t-test. The results of the t-test for the differences in average cost and profit efficiency for the two samples are given in Table 4. The t-test for equal variances is used for the analysis as the Levine's test shows that there are no significant differences in the variance of efficiency scores between foreign banks originated from developed and developing countries. The F-statistics based on the Levine's test are 0.4486 and 0.1323 for cost efficiency and profit efficiency, respectively.

The results in Table 4 clearly indicates that foreign banks originated from developed countries, are more cost and profit efficient than the foreign banks originated from developing countries, and it is statistically significant at 5 and 1% level respectively. This might be due to the reason that the foreign banks from developed countries have more efficient management team and are more technologically advanced as compared to foreign banks from developing countries. This enables them to perform better as results of better human resources and technological advancement which is consistent with theory.

To analyze cost and profit efficiency differences of foreign banks across countries, the descriptive statistics is computed and presented in Table 5. The results in Table 5 show that foreign banks in Malaysia are relatively more cost and profit efficient compared to foreign banks in other ASEAN countries. The average cost and profit efficiency reported are 83.15 and 78.57% respectively.

Table1. Maximum likelihood estimates of the stochastic cost frontier.

Dependent variable: Total cost				
Variable	Coefficient	t-ratio	Coefficient	t-ratio
Constant	1.761	2.210**	1.761	0.338
LNSTAFF	0.809	2.129**	0.809	0.362
LNCAP	0.176	1.131	0.176	0.328
LNINT	0.231	1.139	0.232	0.347
LNLOAN	0.330	1.049	0.330	0.278
LNDEP	0.138	0.300	0.138	0.093
LNINV	0.461	2.570	0.461	0.483
STAFF2	0.130	2.648***	0.130	0.620
CAP2	-0.008	-0.761	-0.008	-0.202
INT2	0.126	3.184***	0.125	1.038
LOAN2	0.090	3.055***	0.090	1.235
DEP2	0.417	3.121***	0.417	1.272
INV2	0.094	3.104***	0.095	0.898
STAFFCAP	0.059	1.717	0.059	0.538
STAFFINT	-0.248	-3.139***	-0.248	-1.663
CAPINT	-0.037	-0.723	-0.037	-0.424
LOANDEP	-0.389	-2.727***	-0.389	-1.032
LOANINV	0.163	2.141**	0.163	0.542
DEPINV	-0.375	-3.245***	-0.375	-1.189
STAFFLOA	0.071	0.898	0.071	0.321
STAFFDEP	-0.220	-1.769*	-0.220	-0.825
STAFFINV	0.168	2.688***	0.168	1.012
CAPLOAN	-0.012	-0.245	-0.012	-0.068
CAPDEP	-0.029	-0.382	-0.029	-0.128
CAPINV	0.044	1.477	0.044	0.389
INTLOAND	-0.193	-3.458***	-0.192	-0.787
INTDEP	0.393	4.387***	0.393	1.304
INTINV	-0.237	-5.210***	-0.237	-2.261
Eta (η)			0.010	0.230
λ	63.673	2.669***	2.996	77.868***
σ	0.735	484.284***	0.697	18.438***
σ_υ	0.735		0.735	
σ_ϖ	0.012		0.697	
Log likelihood	-138.272		2.260	

Significant at **5% and ***1% levels.

The results also indicate that cost efficiency varies significantly among banks in Indonesia (scores range from 5.84 to 91.74%) as compared to other countries. Likewise, the profit efficiency scores for foreign banks in Indonesia also vary significantly ranging from 29.06 to 98.05%. To see whether there is a change in efficiency level across time, the annual cost and profit efficiency scores for each country is also presented in Table 6. The average cost and profit efficiency scores show an increasing trend over the period. This is consistent with the maximum likelihood results reported in Tables 1 and 2. In addition, it also confirms that foreign banks in Malaysia are more cost and profit efficiency as compared to the other ASEAN countries.

The t-test for the differences in average cost and profit efficiency are computed for each country and the results are presented in Table 7. The t-test for unequal variances is used for the analysis as the Levine's test shows that there are differences in variances of cost and profit efficiency scores across countries. The reported F-test from Levine's test for cost efficiency is 181.771 and it is statistically significant at 1% level. On the other hand, the F-test for profit efficiency is 261.678 which are also statistically significant at 1% level.

Table 2. Maximum likelihood estimates of the stochastic profit frontier.

	Dependent variable: Total profit			
Variables	**Coefficient**	**t-ratio**	**Coefficient**	**t-ratio**
Constant	5.750	5.418***	5.750	1.088
LNSTAFF	-0.339	-0.718	-0.339	-0.130
LNCAP	-0.144	-0.759	-0.144	-0.295
LNINT	-0.016	-0.06	-0.016	-0.013
LNLOAN	0.035	0.122	0.035	0.060
LNDEP	-0.213	-0.564	-0.213	-0.165
LNINV	-0.083	-0.352	-0.083	-0.069
STAFF2	-0.051	-0.943	-0.051	-0.177
CAP2	-0.009	-0.892	-0.009	-0.376
INT2	-0.017	-0.388	-0.017	-0.175
LOAN2	0.020	0.837	0.020	0.231
DEP2	0.051	0.501	0.051	0.169
INV2	0.029	0.952	0.029	0.317
STAFFCAP	-0.056	-1.501	-0.056	-0.817
STAFFINT	-0.004	-0.062	-0.004	-0.016
CAPINT	0.013	0.323	0.013	0.195
LOANDEP	-0.065	-0.557	-0.065	-0.166
LOANINV	0.006	0.086	0.006	0.029
DEPINV	-0.034	-0.36	-0.034	-0.138
STAFFLOA	-0.009	-0.131	-0.009	-0.035
STAFFDEP	-0.021	-0.23	-0.021	-0.060
STAFFINV	-0.009	-0.175	-0.009	-0.045
CAPLOAN	-0.089	-1.938	-0.089	-1.016
CAPDEP	0.090	1.401	0.090	0.652
CAPINV	-0.016	-0.54	-0.016	-0.193
INTLOAND	-0.017	-0.292	-0.017	-0.087
INTDEP	-0.014	-0.156	-0.014	-0.064
INTINV	0.015	0.289	0.015	0.116
Eta (η)			0.010	0.173
λ	2.801	11.382***	2.801	18.812***
σ	0.467	459.018***	0.440	9.708***
σ_υ	0.440		0.440	
σ_ϖ	0.157		0.157	
Log likelihood	-56.704		-516.950	

Significant at **5% and ***1% levels.

Table 3. Descriptive statistics for cost and profit efficiency across countries from year 2001 - 2008.

Descriptive statistics	**Cost efficiency**	**Profit efficiency**
Mean	0.7590	0.7657
Standard deviation	0.2115	0.0927
Minimum	0.0584	0.2906
Maximum	0.9174	0.9805
Count	327	327

The results in Table 7 clearly indicate that there are significant difference in average cost efficiency between foreign banks in Malaysia and foreign banks in other ASEAN countries. This again confirms the analysis that

Table 4. Two-sample t-test assuming equal variances for cost and profit efficiency of foreign banks from developed and developing countries.

Cost efficiency	Developed	Developing
Mean	0.7743	0.7118
Variance	0.0340	0.0758
Observations	247	80
t-stat	2.3105**	
P(T<=t) two-tail	0.0215	
t Critical two-tail	1.9673	
Profit efficiency		
Mean	0.7813	0.7175
Variance	0.0030	0.0229
t-stat	5.5948***	
P(T<=t) two-tail	0.0000	
t Critical two-tail	1.9673	

Significant at **5% and ***1% levels.

Table 5. Descriptive statistics for cost and profit efficiency for each country from year 2001 – 2008.

Descriptive statistic	Indonesia	Malaysia	Philippines	Thailand
Cost efficiency				
Mean	0.7466	0.8315	0.7397	0.7329
Standard Deviation	0.2613	0.0592	0.0147	0.0432
Minimum	0.0584	0.7183	0.0073	0.6702
Maximum	0.9174	0.9071	0.8701	0.8137
Count	202	56	34	35
Profit efficiency				
Mean	0.7641	0.7857	0.7756	0.7334
Standard Deviation	0.0998	0.0558	0.0389	0.1231
Minimum	0.2906	0.6847	0.6841	0.5310
Maximum	0.9805	0.8862	0.8112	0.8574
Count	202	56	34	35

foreign banks operating in Malaysia exhibit higher cost efficiency as compared to foreign banks operating in other countries in the region. On the other hand, the results show no significant difference in average cost efficiency between foreign banks operating in Indonesia, Philippines, and Thailand. The results also show that there are significant differences in average profit efficiency scores between foreign banks operating in Malaysia with their counterparts in Indonesia and Thailand. Hence, it can be concluded that foreign banks in Malaysia are relatively more cost and profit efficient as compared to foreign banks operating in Indonesia, Thailand, and Philippines.

The findings that foreign banks in Malaysia are more efficient as compared to other countries in the ASEAN region might be due to the relatively high economic freedom in Malaysia over the years. The overall economic freedom index for Malaysia shown in Table 8 increase gradually from 2001 to 2008, while for other countries in the region, it seems to be decreasing and fluctuating over time.

Trade restriction in Malaysia is also relatively less as compared to the other countries. This might also contribute to the efficiency of foreign banks in Malaysia as they are less restriction in bringing in their capital into Malaysia. The investment freedom and financial freedom index indicates that foreign banks in Indonesia are subjected to significant restriction where foreign investors

Table 6. Descriptive statistics for cost and profit efficiency for each country for each year.

Country	2001	2002	2003	2004	2005	2006	2007
Average cost efficiency scores							
Indonesia	0.7208	0.7298	0.7360	0.7246	0.7280	0.7717	0.8142
Malaysia	0.8270	0.8285	0.8300	0.8315	0.8330	0.8345	0.8359
Philippines	0.7716	0.7736	0.7849	0.7249	0.7168	0.7191	0.7533
Thailand	0.7262	0.7284	0.7307	0.7329	0.7351	0.7374	0.7396
Average profit efficiency scores							
Indonesia	0.7523	0.7635	0.7588	0.7596	0.7676	0.7729	0.7715
Malaysia	0.7801	0.7820	0.7839	0.7858	0.7876	0.7895	0.7913
Philippines	0.7949	0.7967	0.7572	0.7713	0.7757	0.7777	0.7763
Thailand	0.7268	0.7290	0.7312	0.7334	0.7356	0.7377	0.7399

Table 7. Two-sample t-test assuming unequal variances.

Country	Indonesia	Malaysia	Philippines
Cost efficiency			
Indonesia			
Malaysia	-4.2395***		
Philippines	0.2943	5.5088***	
Thailand	0.6948	9.1608***	0.4167
Profit efficiency			
Indonesia			
Malaysia	-2.1104**		
Philippines	0.1186	1.010	
Thailand	1.4001	2.3687**	1.9335

Significant at **5% and ***1% levels.

face strict restrictions on access to foreign exchange and international payment since 2004. In addition, there are extensive government influences in the banking sector where government exercise active ownership and control on banks since 2004. All of this might explain a relatively low cost and profit efficiency level for foreign banks in Indonesia. The results support Hymer (1976) claims that foreign firms faced competitive disadvantages due to information asymmetry resulted from restrictions in the emerging countries. Besides that, Lensink et al. (2008) argued that foreign banks might suffer from bad institutional framework in the host country which is especially prominent in the less developed financial system. This explains a relatively low cost and profit efficiency scores in the ASEAN region especially in countries with significant government intervention.

In addition, Hymer (1976) also suggested that foreign firms might lose out in the host country because of the differences with the country's economy, language, law and politics. This is because distance in terms of location and culture between the parent companies and local subsidiaries lead to less reliable accounting information from the borrowers and hence resulted in banks lower efficiency level. This is supported by Mian (2006) highlighting the issues of higher informational, agency, and enforcement costs due to the effect of institutional distance.

The results of this study is consistent with study by Yao and Jiang (2007), Lensink et al. (2008) and Sturm and Williams (2008) where foreign banks are found to be inefficient in the their study on the foreign banking efficiency in the developing countries.

Conclusion

This study examined foreign banks efficiency in ASEAN countries for the period of 2001 to 2008, using the parametric stochastic frontier analysis (SFA) approach. By doing so, the study can also determine whether the

Table 8. Economic freedom index from year 2001 to 2007.

Country	2001	2002	2003	2004	2005	2006	2007	2008
				Overall score				
Indonesia	52.5	54.8	55.8	52.1	52.9	51.9	53.2	53.2
Malaysia	60.2	60.1	61.1	59.9	61.9	61.6	63.8	63.9
Philippines	60.9	60.7	61.3	59.1	54.7	56.3	56.0	56.0
Thailand	68.9	69.1	65.8	63.7	62.5	63.3	63.5	62.3
				Trade freedom				
Indonesia	67.2	72.6	74.6	74.2	77.2	74.6	74.0	73.0
Malaysia	66.0	66.6	73.0	73.4	75.8	76.6	76.8	76.2
Philippines	68.4	71.6	77.4	77.0	79.4	79.8	79.8	78.8
Thailand	77.6	77.8	64.8	65.6	67.6	68.4	74.2	75.2
				Investment freedom				
Indonesia	50	50	50	30	30	30	30	30
Malaysia	30	30	30	30	30	30	40	40
Philippines	50	50	50	50	30	30	30	30
Thailand	70	70	50	50	30	30	30	30
				Financial freedom				
Indonesia	30	30	30	30	30	30	40	40
Malaysia	30	30	30	30	30	30	40	40
Philippines	50	50	50	50	30	50	50	50
Thailand	50	50	50	50	50	50	50	50

foreign bank's country of origin has any influence on efficiency.

Results show that foreign banks originating from developed countries are more cost and profit efficient as compared to foreign banks from developing countries. This is consistent with theory that suggests firms from developed countries are able to perform better in terms of foreign investment as a result of superior management and technological advancement. In addition, the results found that foreign banks in Malaysia are more cost and profit efficient, relative to foreign banks in other ASEAN region. This might be due to the fact that Malaysia has developing countries. The results are also consistent with relatively high economic freedom over the years as compared to the other countries in the region.

Foreign banks in Indonesia are found to be the least cost and profit efficient. This might be due to the restriction faced by foreign banks in expanding their banking operation and to compete freely with the local banks. The results supported Hymer (1976) and Lensik et al. (2008) argument that foreign firms face competitive disadvantages due to poor institutional framework resulting in information asymmetry in less developed countries. This explains the relatively low cost and profit efficiency scores in the ASEAN region, especially in countries with more government intervention. Mian (2006) argued that the issues of higher informational, agency and

enforcement costs due to institutional distance will result in lower efficiency level of foreign banks in the studies by Yao and Jiang (2007), Lensink et al. (2008) and Sturm and Williams (2008).

Hence, to attract foreign banks into the developing countries, it is suggested that the authorities should liberalize the banking system. Less restrictive banking system will allow healthy competition between foreign and local banks in the developing countries resulting in higher overall banking industry efficiency. Besides that, foreign banks should consider the rules, regulations and the host country's characteristics before entering foreign market. It is suggested that future studies should include the host country's characteristics as factors in influencing efficiency of foreign banks.

REFERENCES

Aigner D, Lovell C, Schmidt P (1977). Formulation and estimation of stochastic frontier production function models. J. Econom., 6: 21-37.
Battese GE, Coelli TJ (1992). Frontier production functions, technical efficiency and panel data with application to paddy fanners in India. J. Prod. Anal., 3: 153-169.
Berger AN, Humphrey DB (1992). Measurement and efficiency issues in commercial banking in Output Measurement in the service sectors (Ed.) Z. Griliches, National Bureau of Economic Research, Studies. In: Income and Wealth, University of Chicago Press, Chicago, 56: 24-79.
Berger AN, Humphrey DB, Pulley LB (1996). Do consumers pay for

one-stop banking? Evidence from an alternative revenue function. J. Bank. Finan., 20: 1601-1621.

Berger AN, Leusner JH, Mingo JJ (1997). The efficiency of bank branches. J. Monetary Econ., 40: 141-162.

Bonin JP, Hasan I, Wachtel P (2005). Bank performance, efficiency and ownership in transition countries. J. Bank. Finan., 29: 31-53.

Boubakri N, Cosset JC, Fischer K, Guedhami O (2005). Privatization and bank performance in developing countries. J. Bank. Finan., 29: 2015-2041.

Claessens S, Demirgüç-Kunt A, Huizinga H (2001). How does foreign entry affect domestic banking markets? J. Bank. Finan., 25: 891-911.

Clark JA, Siems TF (2002). X-efficiency in the banking: Looking beyond the balance sheet. J. Money Credit Bank., 34: 987-1013.

Dages G, Goldberg L, Kinney D (2000). Foreign and domestic bank participation in emerging markets: Lessons from Mexico and Argentina. FRBNY Econ. Pol. Rev., 6(3): 17-37.

Detragiache E, Gupta P (2004). Foreign banks in emerging market crises: Evidence from Malaysia. IMF Working Paper (WP/04/129).

Detragiache E, Gupta P, Tressel T (2006). Foreign banks in poor countries: Theory and evidence. Paper presented at the 7th Jacques Polak Annual Research Conference, International Monetary Fund, Washington, DC.

Dietsch M, Lozano-Vivas A (2000). How the environment determines banking efficiency: A comparison between French and Spanish industries. J. Bank. Finan., 24: 985-1004.

Figueira C, Nellis J, Packer D (2006). Does ownership affect the efficiency of African banks? J. Dev. Areas, 40: 37-63.

Fries S, Taci A (2005). Cost efficiency of banks in transition: Evidence from 289 banks in 15 post-communist countries. J. Bank. Finan., 29: 55-81.

Guala FA (2002). Measuring economies of scale and scope for the Argentine bank industry: A comparative analysis, 1996-1999. UIUC Department of Economics Working Paper. [Online]. Available: http://ssrn.com/abstract=314442.

Hawkins J, Mihaljek D (2001). The Banking industry in the emerging market economies. BIS Paper, (http://www.bis.org/publ/bispapers.htm)

Hymer S (1976). The international operations of national firms: A study of direct foreign investment. MIT Press, Cambridge, Massachusetts.

Kraft E, Hofler R, Payne J (2006). Privatization, foreign bank entry and bank efficiency in Croatia: A fourier-flexible function stochastic cost frontier analysis. Appl. Econ., 38: 2075-2088.

Kroszner RS (1998). Political economy of banking and financial reform in emerging markets. Res. Fin. Serv., 10: 33-51.

Lensink R, Meesters A, Naaborg I (2008). Bank efficiency and foreign ownership: Do good institutions matter? J. Bank. Finan., 32: 834-844.

Levine R (1996). Foreign banks, financial development, and economic growth. In: Claude, E., Barfied, (Eds.), Int. Finan. Mark., AEI Press, Washington, DC.

Lim S (2004). Foreign capital entry in the domestic banking market in Korea: Bitter medicine or poison. Paper presented at the annual meeting of the American Political Science Association, Hilton Chicago and the Palmer House Hilton, Chicago, IL Online <.PDF>. 2009-05-26 from http://www.allacademic.com/meta/p61786_index.html.

Meeusen W, van den Broeck J (1977). Efficiency estimation from Cobb-Douglas production functions with composed error. Int. Econ. Rev., 18: 435-44.

Mian A (2006). The limits of foreign lending in poor countries. J. Finan., 61: 1465-1505.

Moreno R, Villar A (2006). The increased role of foreign bank entry in emerging markets. BIS Papers, 23, See http://www.bis.org/publ/bppdf/bispap23a.pdf

Murray JD, White RW (1983). Economies of scale and economies of scope in multi product financial institutions: A study of British Columbia credit unions. J. Finan., 38: 887-902.

Pulley L, Humphrey D (1993). The role of fixed costs and complementarities in determining scope economies and the cost of narrow banking proposals. J. Bus., 66: 437-462.

Sturm JE, Williams B (2008). Characteristics determining the efficiency of foreign banks in Australia. J. Bank. Finan., 32: 2346-2360.

Williams J, Nguyen N (2005). Financial liberalization, crisis, and restructuring: a comparative study of bank performance and bank governance in South East Asia, J. Bank. Finan., 29 (8-9): 2119-2154.

Yao S, Jiang C (2007). The effects of governance changes on banking efficiency in China: A stochastic distance function approach. GEP Research Paper, 07/19, the University of Nottingham, pp. 1-37.