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The Determinants of Bank Profitability and the Effects of Foreign Ownership

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Abstract

We study the profitability of banks operating in Lebanon between 1996 and 2007 and examine the effect of micro- and macroeconomic variables on it.

We find that foreign control deteriorates bank ROA, and foreign banks (FBs) have better profitability than banks with majority domestic ownership (MDO).

Our results show that ROE and ROA are determined differently among banks. For instance, larger MDO generate higher ROE and ROA, unlike banks with majority foreign ownership (MFO) and FBs. MDO benefit from OBS activities, whereas FBs and MFO lose from this business. A negative correlation between MDO and MFO bank capital and profitability is found, but the opposite for FBs. This suggests that profitable domestic banks hold lesser capital, whereas better capitalization allows FBs to engage in more profitable (risky) businesses. Concentration and economic condition of the host market do not influence FBs, whereas MDO and MFO seem to be negatively affected by concentration, but benefit from the economic growth of the host market.

قمنا بدراسة ربحية المصارف العاملة في لبنان بين عامي 1996 و 2007، وفحص تأثير المتغيرات الاقتصادية الجزئية والكلية عليها. وجدنا أن للملكية الاجنبية في المصارف المحلية تأثيراً سلبياً على العائد على الأصول، في حين أن المصارف الاجنبية تحقق ربحية أفضل من المصارف ذات الملكية المحلية. كما أظهرت نتائجنا ان العائد على الأصول والعائد على حقوق الملكية يتحددان بطرق مختلفة عبر المصارف بحسب ملكيتها. على سبيل المثال، فالمصارف المحلية الاكبر تحقق عائداً أعلى، على عكس المصارف ذات الملكية الاجنبية والمصارف الاجنبية. كما تستفيد المصارف ذات الملكية المحلية من البنود خارج الميزانية، على عكس المصارف الاخرى. بالنسبة لمعدل الرسملة، فهو يرتبط بشكل عكسي مع الربحية لدى المصارف المحلية بغض النظر عن ملكيتها، على عكس المصارف الاجنبية. قد يكون سبب هذا الامر أن المصارف المحلية الاكثر ربحية تحتفظ برأسمال أقل، في حين ان معدل الرسملة العالي يسمح للمصارف الاجنبية بالدخول في استثمارات عالية الربحية (وعالية الخطر). تؤثر نسبة التركيز المصرفي بشكل سلبي على ربحية المصارف المحلية، في حين انها لا تؤثر على ربحية المصارف الاجنبية. اما بالنسبة للنمو الاقتصادي للبلد، فهو يؤثر بشكل ايجابي على المصارف المحلية، في حين لم نجد له تأثير على ربحية المصارف الاجنبية.

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1 Introduction

The increased international trade flows and foreign direct investment activities and the globalization of capital markets, combined with the liberalization of domestic financial markets have caused international banking activity to grow rapidly. The internationalization of banking activities involves cross-border activities or expansion of banks outside their home country (i.e. establishing foreign banks). Thus, the increases in foreign banking were due to the implementation of financial liberalization policies by many countries since early 1990s, allowing foreign banks to set up subsidiaries and branches and domestically-owned banks to become foreign-owned. Foreign banks differ according to the mode of entry: newly established foreign banks (greenfield banks), and domestic banks sold to foreign investors (takeover banks). Greenfield banks are integrated with parent institutions and depend on them for capital and apply their risk and investment management techniques. On the other hand, when taking-over a bank, foreign investors inherit personnel, infrastructure and loan portfolio.

This entry of foreign banks has triggered the interest of policy makers (regulators) and academics. The debate mainly focuses on: (i) the reasons behind foreign entry, (ii) the competitive effects of foreign bank entry on domestic bank efficiency, (iii) the effect of foreign bank entry on the availability and stability of credits to small and medium-sized firms, and (iv) the efficiency differences between foreign and domestic banks.

This paper employs the Lebanese banking system as a case study and tries to explore the issue of foreign banking in emerging markets by proposing two questions: (i) what is the effect of foreign ownership on the performance of banks? And (ii) what is the effect of microeconomic factors and the host market macroeconomic conditions on the performance of foreign banks?

Choosing this specific market was based on the significant foreign banking presence, and its long history of openness to the entry of foreign banks. This case study allows performing several empirical tests: (i) testing the effect of foreign participation (control) on domestic bank performance, (ii) detecting the profitability differences between domestic and foreign banks, and (iii) understanding why domestic and foreign banks achieve different returns.

Therefore, we are going to compare the profitability of foreign and domestic banks operating in Lebanon between 1996 and 2007, and detect any profitability differences between these banks. Besides, we will analyze the effect of bank characteristics and the economic development on this profitability.

To our best knowledge, no previous empirical studies have been conducted on the effect of foreign ownership on bank profitability in an emerging market, specifically in the MENA region. Thus, this study will try to extend the literature

on emerging markets' banking in several dimensions. Firstly, it will try to detect the effect of foreign acquisition on the performance of local banks, and if acquired banks realize better performance (profitability). Additionally, it will compare the profitability of domestic banks with the subsidiaries of foreign banks. Secondly, the study will try to detect the profitability determinants of banks, taking into consideration the effect of ownership structure (foreign vs. domestic). The results of this study may suggest an entrance strategy for foreign banking in an emerging market. i.e. trying to show if the best method for expansion is acquiring an existing player or establishing a bank (subsidiary).

The paper proceeds as follows: we describe the characteristics of the Lebanese banking in section 2. In section 3 we present the literature on foreign banking. We explain the empirical methodology in section 4. The employed data is illustrated and analyzed in section 5. Finally, the empirical results of this paper are presented in section 6.

2 An overview of the Lebanese banking system

The Lebanese economy is a typical model of an open and service-oriented economy where the service sector accounts for about 60% of GDP, with extensive links abroad, an unrestricted exchange and trade system, free access to foreign investment and perfect capital and labor mobility. The banking sector is the centerpiece of the Lebanese economy, and banks represent a very active segment because of the limited role of other financial intermediaries. Prior to the civil war (1975-1990), the Lebanese banking sector was the most advanced banking sector in the Middle East. But it has been seriously affected by the war. By the end of 1990, banks were lagging behind in terms of infrastructures and services, their capitalization levels dropped dramatically and their assets and liabilities became (and still) highly dollarized after a severe depreciation of the Lebanese currency in late 1980s and early 1990s. Since early 1990s, the Lebanese banks have been implementing restructuring and modernization programs and procedures, along with increasing capital, service diversification, debt issuing, and mergers and acquisitions. As a result, the sector has overcome its problems, grown at fast rates and become capable of regaining its leading position in the region. Moreover, the sector has witnessed the return of foreign banks, and the establishment of large number of investment banks to pursue the development of the emerging domestic and regional capital markets. The Lebanese banking sector employs about 1.2% of the total domestic workforce and contributes about 5% of the GDP. More than 80% of the sector's total assets are invested domestically.¹

¹ Source: the Association of Banks in Lebanon.

The Lebanese banking system has several features that represent advantages among the other banking systems in the Middle East and the other emerging markets. These features are:

- a- A free exchange system and a free movement of capital and earnings.
- b- The banking secrecy law, which was implemented in 1956.
- c- The money laundering law and the Due Diligence Convention set up by the Association of Banks in Lebanon to prevent any money-laundering operations.
- d- A free banking zone, which was established in 1975.
- e- Openness to foreign banking.

The Lebanese banking system has a long record of foreign banking. After the First World War, and until the independence in 1943, the banking system was dominated by the foreign banks. Starting with the independence era and the establishment of the central bank (Banque du Liban) in 1964, the banking system has witnessed prosperity and development, which has encouraged the establishment of more domestic banks. Consequently, foreign banks lost their domination and domestic banks became important players in the market. The Lebanese banking sector remains very open to foreign banking and the acquisition of domestic banks by foreign investors is permitted. Foreign banks can receive deposits from the public and perform credit and fiduciary operations and portfolio management on the behalf of other parties. Moreover, foreign banks can carry out brokerage activities on Beirut Stock Exchange. On the other hand, foreign banks are prohibited from: (i) carrying out any activity other than banking, (ii) participating in industrial, commercial or agricultural institutions or any other institutions except within the limits of the private funds, (iii) carrying out any derivatives operations, and (vi) reducing its capital or buying back any part of it.²

Currently, there are 54 commercial banks operating in the Lebanese market with total assets of about \$121 billion.³ These banks can be classified into three categories: (i) 33 banks with majority domestic control (with total assets of about

² Regarding capital adequacy, all banks in Lebanon are required to adopt Basel II rules. Banque du Liban classifies banks operating in Lebanon into 4 categories: Lebanese banks with majority domestic ownership, Lebanese banks with majority foreign ownership, the subsidiaries of foreign banks from countries that do not apply Basel II rules, and the subsidiaries of foreign banks from countries that apply Basel II rules. The first three categories of banks are required to implement Basel II rules similarly to the last category of banks that are required by their home regulators to adopt Basel II rules. Concerning reserve requirements, only Lebanese banks (with majority domestic or foreign control) are subject to this type of regulation, whereas the subsidiary of foreign banks are required to submit a letter (upon the establishment) from the parent company of its willingness to channel liquidity to its subsidiary whenever needed.

³ Source: Central Bank of Lebanon, July 2010. We mention here that the Lebanese banking sector is one of the largest in the world compared to its domestic economy, where the consolidated assets of banks are equal to about four times the GDP.

\$102 billion), (ii) 11 banks with majority foreign control (with total assets of about \$11.5 billion), and (iii) 10 foreign banks (with total assets of about \$7.5 billion). Moreover, there are representative offices of another 14 foreign banks.

All the above cited characteristics of the Lebanese banking system make it an interesting case study for analyzing the effect of foreign ownership on bank performance and analyzing the effect of micro- and macroeconomic variables on this performance taking into consideration the issue of ownership.

3 Foreign banking: an overview of the literature

3.1 Reasons for foreign bank entry

On the determinants of foreign bank entry in the United States, Goldberg and Saunders (1981) and Hultman and McGee (1989) found that interest differential is the most important factor determining foreign bank presence and growth in the U.S. Grosse and Goldberg (1991) claim that foreign investment in the United States, foreign trade with the United States, and the size of the banking sector in the foreign country are positively correlated with the country's bank presence in the United States. Fisher and Molyneux (1996) found that countries with large banking markets have the largest banking presence in London. They found in addition that banks whose home countries are more risky than the UK will have more tendency to conduct business through London. Brealey and Kaplanis (1996) found a positive correlation between the size of a foreign bank and the GDP of its home country. They argue that large economies are large exporters of banks. Dopico and Wilcox (2001) claim that countries that were more economically liberal as measured (i) by their openness to foreign banking, (ii) by permitting banks to undertake more activities, and (iii) by their involvement in international trade, tend to have more foreign banks. Moreover, they found that countries that had smaller domestic banking sectors (relative to their own GDP) tended to have more foreign banks. Finally, Magri, Mori and Rossi (2005) cited four factors that affect foreign banking: (i) trade has a positive effect on foreign bank entry, (ii) the difference of interest spreads, (iii) the level of openness of the host country, and (iv) banks come mainly from larger countries with more developed financial systems.

3.2 The effect of foreign bank entry on the efficiency of domestic banks

Studies have found that the entry of foreign banks motivates domestic banks to reduce costs, increase efficiency and increase the diversity of financial services. The entrance of foreign banks forces domestic banks to improve the quality of their services to retain their market shares, which may improve the quality of

financial services of domestic banks, but at the same time lower their interest margins and profits. Besides, foreign banks may introduce new financial services which stimulate domestic banks to develop such new services. Foreign banks may also introduce modern and more sophisticated banking techniques that are new to domestic banks that may copy those techniques.

Empirically, Claessens, Demirguc-Kunt, and Huizinga (2001) and Clarke et al. (2003) found that foreign bank entry increases the efficiency of domestic banks. Yildirim and Philippatos (2007) state that a higher degree of foreign bank participation is associated with a higher level of competitiveness and efficiency in domestic markets and reduced bank margins and profitability. They also found that domestic bank returns are negatively linked to foreign bank participation. Unite and Sullivan (2003) argue that entry of foreign banks leads to a decline in operating expenses and an increase in domestic banks' risk, where, due to the foreign bank entry, domestic banks may become forced to take on less creditworthy customers due to the increased competition. Levy Yeyati and Micco (2007) observed that foreign penetration may lead to a less competitive environment and thus allows banks to increase profits. Finally, Lensink and Hermes (2004) claimed that foreign bank entry is associated with falling costs, profits and interest margins of domestic banks especially at higher economic development.

3.3 The effect of foreign bank entry on credit availability

Detragiache and Gupta (2006) claim that a larger foreign bank presence is associated with less credit to the private sector and slower credit growth in low income countries, but not in other countries. They stated that foreign banks are better than domestic banks at screening large, transparent borrowers, but are worse at evaluating more opaque borrowers. De Haas and Van Lelyveld (2006) examined the reaction of foreign and domestic banks in Central and Eastern Europe to business cycles and banking crises. Their empirical analysis showed that during crisis periods domestic banks contract credit, whereas greenfield foreign banks play a stabilizing role by keeping their credit base stable. They also found a significant and negative relationship between home country economic growth and host country credit by foreign bank subsidiaries.

3.4 The efficiency differences between foreign and domestic banks

Why would the efficiency of a foreign bank differ from that of a domestic bank? The literature on foreign banking suggests that there are two important reasons for this. First, foreign banks may be less subject to domestic credit allocation rules than domestic banks. Second, domestic banks may have informational advantages

relative to foreign banks. Berger et al. (2000) differentiate between home field advantages and global advantages. The global advantage hypothesis states that foreign banks might benefit from competitive advantages relative to their domestic peers. Foreign banks use more advanced technologies, are more competitive, and have access to an educated labor force that is able to adapt new technologies. Foreign banks could better deal with a systemic crisis because they may find it easier to raise capital or liquid funds on international financial markets during periods of distress. Finally, foreign banks employ more sophisticated risk management techniques and have a better system of internal controls. According to the home field advantage hypothesis, domestic banks' efficiency advantage is sourced in costs borne by the foreign institution; these costs are often called the liability of foreignness.

Another debate has emerged concerning the determinants of foreign bank profitability and the impact of ownership structure on bank performance. It has been argued that foreign banks may be differently affected than domestic banks by the same factors (micro or macro). For instance, they are less sensitive to domestic economic conditions, but on the other hand, they are influenced by additional factors compared to domestic banks, like their home country economic conditions and the strategies of their parent institutions. These factors, among many others, cause the difference in performance between foreign and domestic banks. In the following two sections we cite some of the empirical findings on these differences in the developed and the developing countries.

3.4.1 Foreign banks in developed countries

In general, foreign banks operating in the developed countries have been found to have a poorer performance than domestic ones. For instance, DeYoung and Nolle (1996) observed that foreign banks operating in the U.S. were less efficient than domestic banks. Despite a little difference between the two categories in terms of output efficiency, foreign banks had disadvantages in input efficiency, mainly caused by the excess expenditures on acquired funds. Elyasiani and Mehdian (1997) found that in the U.S., foreign banks were as efficient as domestic banks. Berger et al. (2000) performed an analysis of cross-border banking efficiency in France, Germany, Spain, the UK, and the U.S. They found that foreign banks were less efficient than domestic ones, and the latter had higher cost efficiency and profit efficiency than foreign banks operating in those countries. They also found that the relative efficiency of foreign versus domestic institutions appears to depend on host and home country conditions. Elyasiani and Rezvanian (2002) examined the efficiency difference between foreign and domestic banks in the U.S. Their results showed that although the cost structure of the two categories of banks is different, scale and scope economy measures for the two groups were similar. Finally, Kosmidou et al. (2006) studied the performance of

foreign banks in the UK. They found that foreign banks operate with lower return on equity than domestic banks.

3.4.2 Foreign banks in less developed countries

In less developed countries, the results were somehow conflicting. Demirguc-Kunt and Huizinga (1999) found that foreign banks have higher margins and lower profitability than their domestic counterparts. Sturm and Williams (2004) compared the efficiency of foreign and domestic banks operating in Australia. They show that foreign banks were more input-efficient than domestic ones, mainly due to the superior scale efficiency. However, this fact did not result in superior profitability for foreign banks. Havrylchyk (2006) states that foreign banks were more efficient than their domestic peers. However, their higher (technical and allocative) efficiency were due to the better performance of greenfield banks, whereas acquired banks did not appear to have enhanced efficiency. Sensarma (2006) found that both efficiency and productivity of foreign banks have been lower than those of domestic banks. They explained this by the fact that foreign banks incur huge expenditures in paying high salaries and the use of technology. Yildirim and Philippatos (2007) found that foreign banks operating in Central and Eastern Europe were less efficient than domestically owned private and state-owned banks. Van Horne (2007) claims that developing countries' banks have a competitive advantage dealing with countries with weak institutional climate, and foreign banks coming from developing countries realize higher interest margin (less profitable though) than foreign banks from high-income countries. Sturm and Williams (2008) found that foreign banks were on average less efficient than domestic banks due to increasing expenditures on inputs.

Detragiache and Gupta (2006) analyzed the effect of Malaysian crises on banks and provided evidence on the performance of foreign banks during extreme financial conditions. They found that foreign banks were not homogeneous with respect to their performance during the crisis, and the main distinction was between "regional" foreign banks (banks with operations concentrated in Asia) and "non-regional" ones. They found that non-regional foreign banks had relatively low non-performing loans, and their profitability and capitalization even improved during the crisis and performed better in terms of profitability and interest margin than domestic banks.

4 Methodology

4.1 Variables specification

The profitability of a bank is determined by two sets of variables: internal and external variables. Our objective is to detect the degree of importance of the two sets of factors on foreign and domestic bank performance.

Among the internal variables, we cite the size of the bank (the assets), its investments, its off-balance sheet activities, its efficiency, its ownership structure, etc... On the other hand, the main external variables that affect the bank's profitability are the macroeconomic development, demand and supply conditions, cost of inputs, concentration and competition, regulation (or deregulation), etc... The dependent and the explanatory variables employed in our study are the following.⁴ First, and as mentioned earlier, we will use ROE and ROA as proxy for bank profitability. The asset size (SIZE) of a bank will be utilized to control the effect of scale and scope economies. Off-balance sheet activities (OBS) and private sector loans as proportion of total assets (LOAN) are proxies for banks' investment opportunities/decisions. Customer deposit growth (DEP) represents the growth opportunities/strategies. Capitalization level (CAP) is employed to detect the effect of capital requirements/decision on banks' profitability. Also, the liquidity (LIQ) will control the effect of reserve requirements on banks' profitability. BADEBT will control the effect of credit risk on banks' profitability. The net interest margin (IRS) will control the effect of competition on bank revenues. Cost-to-income ratio (CI) and staff expenses ratio (STAFF) will control the efficiency of bank management. To proxy the effect of the monopolistic behavior of banks, we utilize the proportion of the top 5 banks' assets of the entire banking sector's assets (CONC5). For foreign ownership, we define a bank as "foreign" if it has more than 50% of its equity under foreign control. This implies having two types of foreign banks: (1) domestic banks with majority foreign control (i.e. more than 50% on the bank equity is owned by foreigners), and the subsidiaries of foreign banks. We proxy for the effect of the two variables by two dummy variables: MFO for domestic banks with majority foreign control, and FB for the subsidiaries of foreign banks. To control the effect of income generated by nontraditional banking activities, we utilize the ratio of non-interest income to total income (NII). Finally, to control the effect of the host market economic environment on banks' profitability, we exploit the growth rate of gross domestic product (GDPG).

The above cited variables are the most important determinants of bank profitability used in the literature on bank performance such as Boyd et al. (2001), Peters et al. (2004), Iannotta et al. (2007), Hirtle and Stiroh (2007), and Hauner (2008).

⁴ For the calculation of variables and their expected signs, see Appendix A.

4.2 Model specification

The most popular model for evaluating firm performance is the Return on Equity Model. It is a measure of the rate or return to the bank's shareholders. ROE measures the profitability from the shareholders perspective, and it measures bank accounting profits per dollar of book equity capital. Additionally, we employ the return on assets, which is an indicator of the managerial efficiency and shows how the bank's management converted the institution's assets under its control into earnings. The variables affecting bank profitability and the proposed equation relating ROE and ROA to (some of) their determinants are as following:

$$ROE_{it}(ROA_{it}) = f(SIZE_{it}, OBS_{it}, DEP_{it}, CAP_{it}, LIQ_{it}, BADEBT_{it}, IRS_{it}, CI_{it}, STAFF_{it}, LOAN_{it}, NII_{it}, CONC5_{it}, GDPG_{it}, MFO_{it})$$

The data set under study is a cross-section and time-series (panel data). The first possible applicable estimation in such cases is the Ordinary Least Squares method (OLS). But, since the cross-sectional unites (banks) included in our sample are widely dispersed in terms of efficiency and are drawn from a larger population, the OLS method is not suitable, because it does not tackle these issues. The Fixed Effects (FE) method solves the first problem and allows taking into consideration the firm-specific effects in regression estimates, where they include an individual constant for each firm. The FE method controls for all time-invariant differences between the entities (banks), so the estimated coefficients of the FE models cannot be biased because of omitted time-invariant characteristics. Another applicable method is the Random Effects (RE), which allows for two types of unobserved effects affecting the dependent variable: an idiosyncratic (firm-specific) time-constant effect, which is random, and an idiosyncratic time-varying random error. Unlike the FE model, the RE assumes that the variation across entities is random and uncorrelated with the independent variables included in the model. An advantage of RE is the possibility of including time invariant variables (e.g. ownership), whereas in the FE model these variables are absorbed by the intercept. Additionally, the RE model assumes that the cross-sections included are drawn from a larger universe and they have a common mean value for the intercept and the individual differences in the intercept values of each company are reflected in the error term.⁵

⁵ The test for the appropriate model will be based on Hausman (1978) and will be presented later.

5 Data

5.1 Source of data

To estimate the determinants of bank profitability, we use a sample of unbalanced panel data of 57 commercial banks operated in Lebanon between 1996 and 2007 (33 banks with majority domestic ownership, 11 banks with majority foreign ownership, and 13 foreign banks). Very few banks operating in Lebanon were excluded from our sample due to missing data for some variables. Information about banks is extracted from BilanBanques.⁶ We employ annual accounting data (balance sheet and income statement) for banks for the period 1996-2007 (i.e. 12 years). Finally, the macroeconomic data are taken from the International Financial Statistics, IMF.

5.2 Descriptive statistics

In order to understand the data set under study, we present some descriptive statistics for the three categories of banks in Table 1.⁷ We note that the number of MDO banks included ranges from 32 banks in 1996 to 29 banks in 2007 (with a maximum of 33 banks in 1997, 1998, and 1999); the number of MFO banks ranges from 9 in 1996 to 8 in 2007 (with a maximum of 11 banks in 2002, 2003 and 2004); and the number of FBs included ranges from 11 banks in 1996 to 8 banks in 2007 (with a maximum of 13 banks in 1999 and 2000). The number of included banks depended on the availability of data.

Table 1 shows that FBs recorded the highest average ROE and ROA among the three categories of banks, with the highest variation though (represented by its SD). By considering the annual variation of the ratios, we noticed that that average ROE and ROA for the three groups of banks witnessed a decrease during the period under study. This shows that banks operating in the Lebanese market were under pressure especially after 1998, which resulted in lower returns.

MFO banks have recorded the highest ratios for deposit growth, capitalization, liquidity, credit risk, and reliance on non-interest income. The growth rate of deposits at MDO and MFO witnessed an overall – steady – decline. We also note that MDO banks have attracted – in general – more deposits than the other banks.

⁶ An annual report published by BankData (Lebanon) with the collaboration of the Association of Banks in Lebanon. This report contains the (audited) annual financial statements of all banks operating in Lebanon.

⁷ We will also proceed in the empirical part by decomposing our dataset into three sub-samples: the first contains MDO banks, the second contains MFO banks, and the last contains FBs.

Regarding NII precisely, we mention that MDO banks have increased their reliance on fee-based services between 1996 and 2007 as a plan to diversify their revenues.

FBs that have the highest IRS among the three groups of banks seem to have higher pricing power, which may be a result of the distinguished products and services they offer. However, for the three categories of banks, there was a decline in this ratio during the period under study. This may imply that the Lebanese market had witnessed an increase in competition which forced banks (foreign and domestic) to adopt lower spreads. FBs also recorded the highest average cost-to-income, staff expenses, and lending ratios.

An interesting remark regarding the dispersion of indicators: we observe that FBs have more dispersed ratios, shown by their standard deviations. This suggests that MDO and MFO banks operating in the Lebanese market are more homogenous than FBs. This could be explained by the fact that foreign banks operating in Lebanon come from different countries with different banking cultures and practices.

Finally, we present a correlation matrix (Table 2) for the entire sample to detect the correlations among all variables (dependent and independent) presented previously in the methodology section. This table shows the (preliminary) correlation of the independent variables with the dependent variables. Besides, these correlations will be used in determining the regression models in the following section.

6 Empirical results

6.1 The effect of foreign ownership on bank profitability

In this section, we will try to identify the profitability differences between banks with majority domestic ownership and the other two categories of banks. The purpose of this is to detect/discover the effect of foreign control on domestic bank performance and if this control has any constructive effect on profitability. Besides, we will try to observe if foreign banks have any performance superiority over domestic banks.⁸ The foreign control of domestic banks is represented by a dummy variable (MFO) that takes a value of 1 for banks with foreign ownership that exceeds 50%, zero otherwise. Foreign banks are represented by another dummy variable (FB) that takes the value of 1 for foreign banks, zero otherwise. The regression estimations are presented in Table 3.

We will present different regression models in each section (and table), where each of these models does not include all the control variables. We do this to

⁸ We will not compare the profitability of MFO banks and FBs since this is beyond the scope of the study.

avoid any multicollinearity that exists among some regressors. Therefore, the regressions models that are based on the correlations presented in Table 2, do not combine the variables with high coefficient of correlation in one model.

Before analyzing the effect of the independent variables separately, we look at the significance of the overall models in Table 3. These models seem to be satisfactory for estimating the determinants of banks' profitability, proved by their adjusted R-squared; besides the F-statistics show the significance of the overall models. Regarding the appropriate model for our estimates, the Hausman tests (presented at the end of each table) suggest that the Random Effects Method is the applicable method.

We notice that the foreign control (MFO) seems to have negative (insignificant) effect on bank profitability. This suggests that MFO banks have (a slight) lower ROE, but significant lower ROA than MDO banks, and thus, the shareholders of MDO realize some higher returns than those of MFO banks. As a conclusion, in contrast to the theory of "eliminating inefficient management", the foreign acquisition of domestic banks does not improve their performance (profitability), and may even deteriorate this performance due to the implementation of "inapplicable" management and investment models in the bank.

On the other hand, we notice that the variable representing foreign banks (FB) has a significant positive effect on both ROE and ROA. These results may suggest that foreign banks operating in Lebanon do have superior profitability over their domestic counterparties. This consists with the majority of studies done on emerging markets, which find that foreign banks have better profitability than domestic ones. This better performance results in higher returns received by foreign bank shareholders.

Nevertheless, our empirical results do not match those of Havrylchuk (2006), who found that both Greenfields and acquired banks have better performance than domestic ones (to a different level though). Our findings also contradict Demirguc-Kunt and Huizinga (1999) who found that foreign banks have lower profitability than domestic banks in developing countries, and Sturm and Williams (2004) who did not find any superior profitability for foreign banks over domestic ones.

6.2 The determinants of bank profitability

After having performed a comparison between the profitability of MDO banks and that of MFO banks and FBs and having found evidence about the existence of differences among them, we proceed to find out the causes of these differences. We do this by detecting the effects of several microeconomic and macroeconomic factors that shape the profitability of banks. In the following sections we present

several regression estimates that show the relationship between profitability (represented by ROE and ROA) and the variables that control this profitability for each category of banks.

6.2.1 The profitability determinants of banks with majority domestic ownership (MDO)

In this section we present and analyze the determinants of MDO banks' ROE and ROA. The empirical results are presented in Table 4.

First, the models' adjusted R-squared range from a minimum of 63% for ROE and 60% for ROA, to a maximum of 71% for ROE and 79% for ROA. Thus, these models show high ability to explain the variability of MDO profitability. Besides, the F-statistics show the significance of the models. With respect to the individual coefficients and their significance we observe the following results.

To start with, we add one more variable, which is the (one period) lag ROE and lag ROA (LAGROE and LAGROA). The purpose of this is to detect the "persistence" of profitability at banks. We notice that lag ROE captures a significant effect (at the 1% level) in all ROE and ROA models. This shows that MDO's profitability is strongly persistent and banks that realize higher returns in one year will continue to have such high returns in the following years.

The size of MDO banks has a positive effect on both their ROE and ROA in many of the models presented in Table 4, although the effect of size on ROA is less significant than on ROE. The significant effect on ROE and ROA shows that larger MDO are more profitable than their smaller counterparties. This may be due to the effect of scale and scope economies, the better use of technological innovations, and the ability to expand business abroad, where almost all large Lebanese banks have branch networks and banking operations overseas.

MDO banks benefit significantly from OBS activities. This variable captures positive and significant effect in one of ROE's models and all ROA's models. Domestic Lebanese banks are relying more on this type of business to improve their profitability.

Deposit growth does not seem to have a beneficial effect on MDO. This could be explained by the limited investment opportunities in the (small) Lebanese market. Besides, domestic banks are subject to firm regulations regarding overseas lending and also forbidden from investing in risky derivatives instruments.

The empirical results show a negative correlation between CAP and both ROE and ROA. This shows that profitable MDO tend to have lower capitalization, whereas less profitable ones tend to keep higher capital. This is due to the ability of profitable banks to provide new capital when needed by relying on their profits.

Liquidity seem to add value to MDO profits, where they tend to invest large amounts of their funds in Lebanese government T-bills with relatively high rate of return.

BADEBT shows the expected effect on ROE and ROA: MDO banks with higher bad debts and poor credit profiles suffer from lower profitability (this variable captures a significant effect at the 1% in the presented models). IRS increases MDO profits, where those with distinguished products have the ability to increase their profits (the effect of this variable is at the 1% level in all the presented models). CI lowers MDO profitability: MDO banks that are unable to control their expenses will also suffer lower profits.

On the other hand, STAFF is positively correlated with both ROE and ROA. This may be interpreted that spending on skilled personnel does not represent a burden for MDO banks, but income generating.

It seems that MDO that expand their activities in business related to fees and commissions are able to increase their ROE and ROA. This is shown by the positive sign (significant at the 1% level) captured by NII. On the other hand, lending does not enhance bank earnings same as fee-based activities, which is shown by the effect of LOAN, which is significant at the 10% level in one of ROE models and one of ROA models.

Banking concentration has a strong negative effect on MDO banks. This may show that the increasing concentration and competition puts pressure on MDO banks and forces them to lower their yields and consequently, lowers their ROE and ROA.

Finally, GDPG has the same positive and significant effect on ROE and ROA. Thus, MDO banks are strongly influenced by the economic conditions of their home markets since the majority of their investments and businesses are concentrated locally, due to the foreign expansion restrictions imposed by the central bank. Thus, MDO profitability perfectly matches the domestic economic cycle: improves during booms and depresses during recessions.

6.2.2 The profitability determinants of banks with majority foreign ownership (MFO)

The empirical results of the determinants of MFO profitability are presented in Table 5. The presented models show higher explanatory power (higher adjusted R-squared) than those of MDO banks, and seem to be satisfactory in explaining the variability of MFO banks' ROE and ROA. ROE adjusted R-squared ranges from 57% to 86%, and ROA adjusted R-squared ranges from 70% to 90%. In addition, the F-statistics show the significance of the overall models. Looking at the individual coefficients, we obtain the following results.

Similarly to MDO banks, the profitability of MFO banks is persistent and banks that realize high ROE and ROA will continue to realize such high returns in the future.

SIZE is positively and significantly correlated to ROE in two out of three models. This suggests that the shareholders of large and small MFO banks achieve higher returns. Turning to ROA, we notice that the size has a destructive effect on MFO bank's ROA. It seems that smaller banks realize higher ROA than larger ones, which may suggest a problem of excess capacity at those banks.

OBS activities show to have a negative effect (insignificant though) on both ROE and ROA. Deposit growth has contradicting impact on MDO ROE and ROA. It improves the returns on equity but deteriorates the returns on assets. This may suggest that deposit growth is matched by an increase in assets, but without a matched increase in profits. Thus, increasing deposits does not add much value to MFO banks, and we may conclude that MFO banks' profitability improves from fees and commissions more than activities related to lending. This is also consistent with the positive and significant effect of the non-interest income (NII) on both ROE and ROA. Thus MFO banks engaging in traditional banking activities tend to have lower returns, whereas those involving in more fee-based activities achieve higher returns. The negative and significant effect of LOAN on ROA shown in one model adds evidence on the negative effect of traditional lending activities on MFO profitability.

Similarly to MDO, capitalization is negatively correlated with MFO's ROE and ROA. This shows that profitable MFO tend to hold lower capitalization since they have the ability to provide new capital when needed by relying on their profits. Liquid assets are significantly correlated to the profitability of MFO banks and higher liquidity results in higher profitability.

BADEBT shows to have the expected impact. This variable has a negative and significant effect in the all presented models (at the 1% level in most models). IRS has a positive and significant effect in all models (at the 1% level in most models). Same as for MDO banks, MFO banks with distinguished products, are able to set higher rates and extract higher returns. CI shows that banks that are unable to control their expenses will suffer lower returns, since this variable captures a negative effect and significant at the 1% level.

Our empirical results show that MFO banks are not affected by banking concentration to the same extent as MDO. CONC5 captures a significant negative effect in only one of ROE models (at the 5% level) and one of ROA models (at the 10% level).

Finally, regarding the effect of GDP growth, we notice that this variable acquires also less effect than in the case of MDO. For ROE the coefficients show a positive and significant impact in three models, whereas for ROA it is significant in one model only. This may suggest that MFO banks are also affected

by the economic development of the Lebanese market, but to a lower extent than MDO. This could be interpreted that a part of MFO banks is located abroad which minimizes the effect of the domestic economic conditions on their profitability.

6.2.3 The profitability determinants of foreign banks (FBs)

The empirical results of the determinants of FBs profitability are presented in Table 6. The presented models show lower explanatory power (lower adjusted R-squared) than those of MDO and MFO banks. However, they seem to be satisfactory in explaining the variability of FBs' ROE and ROA. ROE adjusted R-squared ranges from 29% to 53%, and ROA adjusted R-squared ranges from 45% to 66%. In addition, the F-statistics show the significance of the overall models. Looking at the individual coefficients, we notice the following outcomes.

Firstly, we notice that similarly to MDO and MFO banks, the profitability of FBs is persistent and banks that realize high ROE and ROA will continue to realize such high returns in the future. This is shown by the significant correlation between LAGROE and ROE, and between LAGROA and ROA.

The size of FBs has opposing effects on ROE and ROA. Larger FBs realize higher ROE (maybe because they hold relatively lower capital), but lower ROA maybe due to excess capacity.

OBS activities does not have an effect on foreign bank profitability, and those that engage more in OBS activities will not realize higher returns.

Deposit growth does not have any effect on ROE, but some positive effect on ROA. Thus, increasing deposits does not add much value to FBs' ROE, but adds value to their ROA.

Conversely to MDO and MFO, FBs' capital has a positive and significant effect on both ROE and ROA. This may imply that higher capitalized foreign banks are likely to have better performance, since they are able to engage in more risky investment that generate higher returns.

Liquidity has a positive effect on profitability since this variable has a significant effect on both ROE and ROA. We have checked the balance sheet of those banks and found that under "liquid assets" there are considerable items such as deposit with the head office and other financial institutions, which may imply that foreign banks operating in Lebanon tend to channel funds to their parent companies that invest these funds abroad (with high returns), and (a part of) these revenues are channeled back to the subsidiary.

BADEBT shows to have the expected impact on ROE and ROA. IRS has a positive and significant effect in all ROA models, but in none of ROE models. CI and STAFF show a negative and significant effect on both ROE and ROA. This implies that personnel expenses represent a burden for FBs.

The insignificant effect of LOAN implies that lending does not add value to FBs profitability. This is consistent with the effect of LIQ where channeling funds abroad to their parent company is more profitable for foreign banks. NII has a positive and significant effect on ROA, but without any significant impact on ROE.

Our empirical results show that foreign banks are not affected (positively or negatively) by the concentration in the host market. The variable CONC5 did not capture a significant effect in any of the models presented.

Finally, and most interestingly, we notice that GDPG did not gain any effect on ROE and ROA. This may suggest that FBs are not affected at all by the economic development in the host market since the majority of their funds are channeled and invested abroad. This is consistent with the literature that argues that foreign banks are not influenced by the conditions of the host market.⁹ Maybe this is due to the fact that they collect deposits from the host market and channel them to their home market where the investments are more profitable.

7 Conclusion and discussion

We have studied the profitability of banks operating in Lebanon between 1996 and 2007. We were interested in detecting the profitability differences among the three categories of banks: banks with majority domestic ownership, banks with majority foreign ownership, and the subsidiaries of foreign banks. Additionally, we have tested the effect of several micro- and macroeconomic variables on bank profitability to uncover how this profitability is determined. Several internal variables that represent bank's characteristics and two external variables (banking concentration and GDP growth) have been chosen, and their impact on bank ROE and ROA was identified.

Firstly, we have found that foreign control does not add value to domestic bank ROE and this is shown by the negative correlation between foreign control and domestic banks' ROE and ROA. Regarding FBs, the empirical results show that they realize significant higher ROE and ROA than MDO.

Secondly, regarding the determinants of ROE and ROA, we have observed that the impact of the employed independent variables differs according to the category of banks. Consequently, bank profitability in Lebanon is shaped differently among banks.

For instance, the size of MDO banks has a positive impact on their profitability (both ROE and ROA), whereas this variable does not discriminate MFO banks and FBs in the same way: larger MFO and FBs realize higher ROE maybe due to their lower capitalization, but lower ROA may be resulted from

⁹ See for instance Brealy and Kaplanis (1996), Williams (1998) and Molyneux and Seth (1998).

excess capacity. MDO banks benefit from OBS activities, whereas both MFO banks and FBs may lose from this type of business. The results show a negative correlation between MDO and MFO banks' capital and profitability, whereas the opposite was found for FBs. This may suggest that profitable MDO and MFO banks hold lower capital, whereas better capitalization allows FBs to engage in more profitable businesses (more risky).

Staff expenses do not represent a burden for MFO and MDO, which suggests that spending on skilled employees results in generating higher returns, whereas the opposite was found for FBs.

Banking concentration did not have a significant effect on FBs, whereas increase concentration seems to put pressures on the returns of MDO and MFO banks. Finally, foreign banks are not affected by the host market economic circumstances.

Overall, this paper has had two main findings: (1) it has detected the effect of foreign ownership on domestic banks, and (2) it has compared the effect of different variables on bank profitability. Accordingly, it showed that the acquisition of domestic banks by foreign banks/investors does not necessarily improve their performance. In fact, according to our case study, the performance of acquired banks has lower performance (profitability) than domestic banks domestically controlled. This may propose that it is not feasible to implement the investment and business techniques and models by the new (foreign) owners in the acquired bank, maybe because the business structure and culture of the acquired bank cannot absorb these models and techniques.

The second implication of this study is that it might be more reasonable (and feasible) for a bank willing to expand in an emerging market, to establish a subsidiary (Greenfield) rather than acquiring an existing player. This is based on the conclusions of the study that show that the subsidiaries of foreign banks are more profitable than domestic banks with domestic control, whereas the opposite conclusion was found when comparing domestic banks with domestic control with domestic banks with foreign control.

The third implication is that a foreign bank cannot implement the business models of the local banks of the host market. The empirical results of the study imply that what is profitable for a domestic bank is not profitable for a foreign bank. Thus, a foreign bank may adopt different procedures and practices than domestic banks, and yet, achieve higher returns.

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Appendix A
Calculation of control variables

| Variable | Description | Expected sign |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <i>Dependent variables</i> | | |
| ROE | After tax net income-to-average equity | |
| ROA | After tax net income-to-average assets | |
| <i>Independent variables</i> | | |
| SIZE | Natural log of assets | + |
| OBS | Log off-balance sheet (assets side) | + |
| DEP | Customer Deposit growth (percentage) | + |
| CAP | Equity-to-asset ratio | +/- |
| LIQ | Cash and central bank + T-bills + marketable securities + deposits with head office and branches and with the other banks divided by total assets | +/- |
| BADEBT | Bad debts-to-gross loans | - |
| IRS | Net interest margin-to-average assets | + |
| CI | Cost-to-income ratio | - |
| STAFF | Staff expenses-to-average assets | - |
| LOAN | Loan-to-asset ratio | +/- |
| NII | Non-interest income-to-by total revenues | + |
| MFO/FB | Dummy variable | + |
| CONC5 | Assets of top 5 banks-to-sector total assets | + |
| GDPG | GDP growth rate (%) | + |

Table 1
Descriptive statistics for banks operating in Lebanon (1996-2007)

| | | MDO | MFO | FBs |
|--------|------|--------|--------|--------|
| ROE | Mean | 11.41 | 7.66 | 12.55 |
| | SD | 10.22 | 11.67 | 27.66 |
| | Max | 59.31 | 33.55 | 83.33 |
| | Min | -20.22 | -34.37 | -71.98 |
| ROA | Mean | 0.83 | 0.83 | 0.86 |
| | SD | 0.75 | 1.27 | 1.35 |
| | Max | 5.62 | 4.82 | 3.26 |
| | Min | -2.57 | -3.63 | -5.88 |
| DEP | Mean | 16.81 | 25.04 | 9.21 |
| | SD | 21.14 | 54.14 | 39.09 |
| | Max | 237.32 | 346.36 | 380.15 |
| | Min | -98.65 | -68.11 | -40.40 |
| CAP | Mean | 9.38 | 10.78 | 10.19 |
| | SD | 6.84 | 5.57 | 9.63 |
| | Max | 67.46 | 27.01 | 57.15 |
| | Min | 0.68 | 2.82 | 0.72 |
| LIQ | Mean | 65.78 | 72.19 | 61.17 |
| | SD | 10.85 | 15.09 | 14.19 |
| | Max | 89.97 | 93.37 | 96.56 |
| | Min | 36.01 | 26.27 | 25.38 |
| BADEBT | Mean | 0.84 | 2.25 | 1.27 |
| | SD | 1.51 | 5.63 | 4.99 |
| | Max | 8.37 | 47.76 | 42.63 |
| | Min | -8.24 | -3.86 | -17.39 |
| IRS | Mean | 2.48 | 2.94 | 3.39 |
| | SD | 0.99 | 1.33 | 1.37 |
| | Max | 6.97 | 6.71 | 8.26 |
| | Min | 0.09 | 0.19 | -0.06 |
| CI | Mean | 71.86 | 81.93 | 87.62 |
| | SD | 26.14 | 42.46 | 93.57 |
| | Max | 273.38 | 269.66 | 388.77 |
| | Min | 24.81 | 20.89 | 29.54 |
| STAFF | Mean | 1.20 | 1.47 | 1.53 |
| | SD | 0.59 | 0.69 | 0.82 |
| | Max | 3.61 | 4.05 | 5.30 |
| | Min | 0.15 | 0.38 | 0.63 |
| LOAN | Mean | 27.75 | 23.10 | 31.79 |
| | SD | 9.20 | 13.31 | 14.86 |
| | Max | 51.87 | 66.97 | 66.62 |
| | Min | 7.46 | 5.48 | 0.43 |

| | | | | |
|----------------------|------|-------|-------|--------|
| NII | Mean | 26.84 | 27.69 | 24.89 |
| | SD | 11.56 | 14.06 | 13.02 |
| | Max | 89.01 | 82.19 | 102.65 |
| | Min | -5.46 | 5.53 | 3.52 |
| Cross sections (Max) | | 33 | 11 | 13 |

Source: BilanBanques.

Table 2

Correlation matrix for the dependent and independent variables

| | ROE | ROA | SIZE | OBS | DEP | CAP | LIQ | BADEBT | IRS | CI | STAFF | LOAN | NII | CONC5 | GDPG |
|--------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|------|-------|------|
| ROE | 1 | | | | | | | | | | | | | | |
| ROA | 0.66 | 1 | | | | | | | | | | | | | |
| SIZE | 0.20 | 0.05 | 1 | | | | | | | | | | | | |
| OBS | 0.16 | 0.03 | 0.53 | 1 | | | | | | | | | | | |
| DEP | 0.04 | 0.04 | -0.03 | -0.02 | 1 | | | | | | | | | | |
| CAP | -0.21 | -0.05 | -0.48 | -0.33 | -0.03 | 1 | | | | | | | | | |
| LIQ | 0.10 | 0.19 | 0.14 | 0.01 | 0.02 | -0.01 | 1 | | | | | | | | |
| BADEBT | -0.15 | -0.07 | -0.07 | -0.05 | 0.05 | 0.03 | 0.04 | 1 | | | | | | | |
| IRS | 0.25 | 0.38 | -0.42 | -0.11 | 0.15 | 0.41 | -0.13 | 0.13 | 1 | | | | | | |
| CI | -0.60 | -0.65 | -0.21 | -0.10 | 0.00 | 0.03 | -0.21 | 0.12 | -0.15 | 1 | | | | | |
| STAFF | -0.15 | -0.25 | -0.54 | -0.16 | 0.14 | 0.42 | -0.26 | 0.03 | 0.65 | 0.27 | 1 | | | | |
| LOAN | 0.00 | -0.10 | -0.01 | 0.07 | -0.02 | -0.25 | -0.90 | -0.06 | 0.06 | 0.14 | 0.13 | 1 | | | |
| NII | -0.20 | -0.17 | -0.15 | -0.13 | -0.04 | -0.10 | -0.10 | 0.07 | -0.40 | 0.20 | 0.03 | 0.07 | 1 | | |
| CONC5 | -0.15 | -0.08 | 0.26 | 0.10 | -0.21 | 0.04 | 0.26 | -0.10 | -0.35 | -0.02 | -0.27 | -0.27 | 0.07 | 1 | |
| GDPG | 0.22 | 0.20 | -0.08 | 0.04 | 0.01 | 0.02 | 0.00 | -0.01 | 0.20 | -0.10 | 0.16 | 0.00 | 0.06 | 0.14 | 1 |

Table 3

The profitability differences between MDO and both MFO and foreign banks (1996-2007). Method: Random Effects.

| | ROE | | | | | ROA | | | | |
|------------|--------------------|--------------------|---------------------|--------------------|--------------------|----------------------|---------------------|--------------------|---------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (1) | (2) | (3) | (4) | (5) |
| Constant | -7.70 (7.24) | 10.04 (6.52) | -13.15** (6.03) | 17.12*** (2.07) | -14.02** (6.00) | -2.28*** (0.34) | 2.18*** (0.39) | -2.65*** (0.33) | 0.99*** (0.12) | -1.49*** (0.32) |
| LAGROE/ROA | 0.31*** (0.03) | 0.31*** (0.03) | 0.44*** (0.03) | 0.32*** (0.03) | 0.33*** (0.03) | 0.25*** (0.02) | 0.40*** (0.03) | 0.35*** (0.03) | 0.38*** (0.03) | 0.26*** (0.02) |
| SIZE | 1.76*** (0.35) | 0.06*** (0.38) | | | 1.66*** (0.35) | 0.08*** (0.02) | 0.04** (0.02) | | | 0.09*** (0.02) |
| OBS | | | 0.08 (0.12) | 0.04 (0.10) | | | | 0.002 (0.01) | -0.001 (0.01) | |
| DEP | 0.01 (0.01) | 0.02 (0.01) | | 0.02* (0.01) | | 0.001* (0.001) | 0.001* (0.001) | | 0.001** (0.001) | |
| CAP | | | -0.031*** (0.07) | -0.23*** (0.06) | | | | -0.01 (0.004) | | |
| LIQ | 0.01 (0.03) | | 0.11** (0.04) | | | 0.01*** (0.001) | | 0.02*** (0.002) | | |
| BADEBT | -0.56*** (0.12) | -0.46*** (0.12) | -0.79*** (0.14) | | -0.57*** (0.12) | -0.04*** (0.01) | -0.02*** (0.01) | -0.06*** (0.01) | | -0.04*** (0.01) |
| IRS | 1.81*** (0.50) | | 3.34*** (0.57) | | 2.39*** (0.46) | 0.44*** (0.03) | | 0.49*** (0.03) | | 0.41*** (0.02) |
| CI | -0.13*** (0.01) | -0.14*** (0.01) | | -0.16*** (0.01) | -0.13*** (0.01) | -0.01*** (0.0004) | -0.01*** (0.001) | | -0.01*** (0.001) | -0.01*** (0.0004) |
| STAFF | | -0.52 (0.82) | | -0.58 (0.75) | | | -0.05 (0.05) | | -0.04 (0.04) | |
| LOAN | | 0.04 (0.04) | | 0.06 (0.04) | | | -0.003 (0.002) | | -0.001 (0.002) | |
| NII | -0.05 (0.04) | -0.02 (0.03) | -0.01 (0.05) | | -0.08** (0.04) | 0.01*** (0.001) | 0.002 (0.001) | 0.01*** (0.002) | | 0.01*** (0.001) |
| CONC5 | -0.16* (0.09) | -0.19** (0.09) | -0.11 (0.10) | | | 0.002 (0.003) | -0.01 (0.01) | -0.01*** (0.01) | | |

| | | | | | | | | | | |
|--------------------|--------------------|--------------------|-------------------|--------------------|------------------|-----------------|-------------------|-------------------|-------------------|-----------------|
| GDPG | 23.09*** (6.43) | 29.46*** (6.54) | 17.11** (7.65) | 24.25*** (6.49) | | 0.37 (0.29) | 1.83*** (0.37) | 0.32 (0.39) | 1.67*** (0.38) | |
| MFO | -0.07 (1.16) | -0.86 (1.17) | -1.77 (1.35) | -0.08 (1.19) | -0.06 (1.14) | -0.04 (0.05) | -0.11* (0.07) | -0.15* (0.09) | -0.08 (0.07) | -0.05 (0.06) |
| FB | 3.07*** (1.13) | 3.77*** (1.14) | 2.37* (1.29) | 2.65** (1.13) | 2.26** (1.11) | 0.06 (0.05) | 0.13** (0.07) | 0.30*** (0.09) | 0.17*** (0.07) | 0.02 (0.06) |
| Adj.- R^2 | 0.5915 | 0.5836 | 0.4200 | 0.5820 | 0.5855 | 0.7365 | 0.6318 | 0.5409 | 0.6152 | 0.7062 |
| Obs. | 604 | 604 | 586 | 586 | 605 | 604 | 604 | 586 | 586 | 605 |
| F-statistic | 70.87 | 68.62 | 37.93 | 79.13 | 103.43 | 135.86 | 83.79 | 61.09 | 90.69 | 175.28 |
| Prob(F-stat.) | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hausman test | | | | | | | | | | |
| χ^2 statistic | 13.13 | 8.17 | 11.75 | 13.28 | 11.24 | 26.06 | 23.70 | 17.08 | 19.32 | 21.83 |
| Prob(χ^2) | 0.4352 | 0.8917 | 0.4835 | 0.4781 | 0.1843 | 0.1849 | 0.3392 | 0.1592 | 0.1691 | 0.3076 |

Notes:

Standard error in parentheses.

*** Significantly different from zero at the 1% level.

** Significantly different from zero at the 5% level.

* Significantly different from zero at the 10% level.

Table 4

The profitability determinants of banks with majority domestic ownership (1996-2007). Method: Random Effects.

| | ROE | | | | | ROA | | | | |
|------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|--------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (1) | (2) | (3) | (4) | (5) |
| Constant | -5.67 (5.61) | 18.49*** (5.42) | -9.37** (3.87) | 17.99*** (1.73) | -10.27** (4.69) | -0.29 (0.34) | 2.33*** (0.38) | -2.02*** (0.30) | 1.94*** (0.12) | -0.04 (0.30) |
| LAGROE/ROA | 0.36*** (0.03) | 0.39*** (0.03) | 0.47*** (0.03) | 0.37*** (0.03) | 0.41*** (0.03) | 0.10*** (0.03) | 0.18*** (0.03) | 0.38*** (0.03) | 0.11*** (0.03) | 0.18*** (0.03) |
| SIZE | 1.05*** (0.26) | 0.53* (0.28) | | | 0.99*** (0.26) | 0.03** (0.02) | 0.01 (0.02) | | | 0.04** (0.02) |
| OBS | | | 0.27*** (0.08) | 0.04 (0.08) | | | | 0.03*** (0.01) | 0.01* (0.01) | |
| DEP | 0.01 (0.01) | -0.01 (0.02) | | 0.02 (0.01) | | -0.001 (0.001) | -0.0003 (0.001) | | 0.001 (0.001) | |
| CAP | | | -0.26*** (0.05) | -0.17*** (0.04) | | | | -0.01* (0.003) | -0.01* (0.002) | |
| LIQ | 0.07** (0.03) | | 0.08*** (0.03) | | | 0.01*** (0.001) | | 0.01*** (0.002) | | |
| BADEBT | -0.96*** (0.20) | -0.58*** (0.21) | -1.24*** (0.19) | | -0.91*** (0.20) | -0.07*** (0.01) | -0.02 (0.01) | -0.11*** (0.02) | | -0.06*** (0.01) |
| IRS | 2.79*** (0.45) | | 3.49*** (0.39) | | 3.28*** (0.41) | 0.39*** (0.03) | | 0.44*** (0.03) | | 0.37*** (0.03) |
| CI | -0.10*** (0.01) | -0.13*** (0.01) | | -0.20*** (0.01) | -0.10*** (0.01) | -0.01*** (0.001) | -0.02*** (0.001) | | -0.02*** (0.001) | -0.01*** (0.001) |
| STAFF | | 0.62 (0.71) | | 1.59*** (0.54) | | | 0.23*** (0.05) | | 0.34*** (0.04) | |
| LOAN | | 0.01 (0.04) | | 0.06* (0.03) | | | 0.002 (0.002) | | 0.003* (0.002) | |
| NII | 0.09*** (0.03) | 0.003 (0.03) | 0.07** (0.030) | | 0.10*** (0.03) | 0.01*** (0.001) | 0.002 (0.002) | 0.01*** (0.002) | | 0.01*** (0.001) |
| CONC5 | -0.20*** (0.07) | -0.26*** (0.07) | -0.03 (0.07) | | | -0.002 (0.004) | -0.01** (0.004) | 0.01 (0.01) | | |
| GDPG | 19.22*** (4.80) | 26.42*** (5.04) | 11.69** (4.65) | 16.72*** (4.25) | | 0.92*** (0.28) | 1.87*** (0.33) | 0.42 (0.35) | 0.98*** (0.28) | |

| | | | | | | | | | | |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Adj.- R^2 | 0.7052 | 0.6760 | 0.6282 | 0.7075 | 0.6926 | 0.7925 | 0.7074 | 0.6000 | 0.7799 | 0.7796 |
| Obs. | 363 | 363 | 361 | 361 | 364 | 363 | 363 | 361 | 361 | 364 |
| F-statistic | 87.62 | 76.53 | 68.61 | 109.86 | 137.34 | 139.29 | 88.54 | 61.02 | 160.50 | 215.04 |
| Prob(F-stat.) | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hausman test | | | | | | | | | | |
| χ^2 statistic | 14.22 | 8.85 | 12.73 | 14.39 | 12.18 | 28.24 | 25.68 | 18.50 | 20.93 | 23.65 |
| Prob(χ^2) | 0.4903 | 0.8690 | 0.5238 | 0.5169 | 0.1697 | 0.2903 | 0.4108 | 0.1725 | 0.1232 | 0.3325 |

Notes:

Standard error in parentheses.

*** Significantly different from zero at the 1% level.

** Significantly different from zero at the 5% level.

* Significantly different from zero at the 10% level.

Table 5

The profitability determinants of banks with majority foreign ownership (1996-2007). Method: Random Effects.

| | ROE | | | | | ROA | | | | |
|------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|--------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (1) | (2) | (3) | (4) | (5) |
| Constant | 4.72 (9.39) | 11.97 (7.81) | -20.65** (0.57) | 24.32*** (2.52) | 15.96 (9.99) | -1.52** (0.62) | 3.97*** (0.71) | -3.75*** (0.63) | 1.72*** (0.22) | 0.44 (0.56) |
| LAGROE/ROA | 0.27*** (0.04) | 0.28*** (0.05) | 0.57*** (0.06) | 0.28*** (0.05) | 0.26*** (0.04) | 0.24*** (0.03) | 0.37*** (0.04) | 0.49*** (0.05) | 0.26*** (0.05) | 0.28*** (0.03) |
| SIZE | 1.67*** (0.50) | 1.01** (0.51) | | | 0.26 (0.56) | -0.04 (0.03) | -0.15*** (0.04) | | | -0.01 (0.03) |
| OBS | | | -0.02 (0.15) | 0.01 (0.10) | | | | -0.01 (0.01) | -0.02 (0.01) | |
| DEP | 0.01* (0.01) | 0.02** (0.01) | | 0.01 (0.01) | | -0.001** (0.001) | 9.88E-05 (0.001) | | -0.001 (0.001) | |
| CAP | | | -0.55*** (0.17) | -0.50*** (0.10) | | | | -0.02 (0.01) | -0.03*** (0.01) | |
| LIQ | 0.06* (0.04) | | 0.14** (0.06) | | | 0.02*** (0.002) | | 0.02*** (0.004) | | |
| BADEBT | -0.24*** (0.09) | -0.18* (0.09) | -0.46*** (0.14) | | -0.29*** (0.09) | -0.04*** (0.01) | -0.02*** (0.01) | -0.05*** (0.01) | | -0.03*** (0.01) |
| IRS | 1.35** (0.52) | | 3.90*** (0.89) | | 3.23*** (0.59) | 0.44*** (0.04) | | 0.51*** (0.07) | | 0.34*** (0.03) |
| CI | -0.18*** (0.01) | -0.19*** (0.02) | | -0.23*** (0.12) | -0.21*** (0.01) | -0.02*** (0.001) | -0.02*** (0.001) | | -0.02*** (0.001) | -0.02*** (0.001) |
| STAFF | | 0.24 (0.96) | | 1.68* (0.89) | | | 0.12 (0.09) | | 0.11 (0.08) | |
| LOAN | | 0.12** (0.05) | | 0.05 (0.04) | | | -0.01** (0.004) | | -0.003 (0.003) | |
| NII | 0.02 (0.04) | 0.08** (0.04) | 0.16 (1.59) | | 0.13*** (0.05) | 0.03*** (0.002) | 0.01** (0.003) | 0.02*** (0.01) | | 0.02*** (0.002) |
| CONC5 | -0.21** (0.08) | -0.13 (0.09) | -0.11 (0.14) | | | -0.002 (0.01) | -0.002 (0.01) | -0.02* (0.01) | | |
| GDPG | 22.53*** (6.34) | 23.68*** (6.92) | 17.07 (10.68) | 15.94** (6.99) | | 0.25 (0.42) | 0.98 (0.61) | 0.78 (0.77) | 1.34** (0.66) | |

| | | | | | | | | | | |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Adj.- R^2 | 0.8118 | 0.8071 | 0.5725 | 0.8279 | 0.8589 | 0.9025 | 0.8269 | 0.6964 | 0.8117 | 0.8836 |
| Obs. | 119 | 119 | 115 | 115 | 115 | 119 | 119 | 115 | 115 | 119 |
| F-statistic | 51.89 | 50.38 | 17.96 | 69.57 | 70.39 | 110.66 | 57.36 | 30.06 | 62.45 | 150.32 |
| Prob(F-stat.) | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hausman test | | | | | | | | | | |
| χ^2 statistic | 10.05 | 6.26 | 9.00 | 9.82 | 9.13 | 29.15 | 18.15 | 13.07 | 14.78 | 16.69 |
| Prob(χ^2) | 0.3323 | 0.6830 | 0.4501 | 0.2776 | 0.5194 | 0.1416 | 29.04 | 0.2618 | 0.1296 | 0.8649 |

Notes:

Standard error in parentheses

*** Significantly different from zero at the 1% level.

** Significantly different from zero at the 5% level.

* Significantly different from zero at the 10% level.

Table 6
The profitability determinants of foreign banks (1996-2007)
Method: Random Effects.

| | ROE | | | | | ROA | | | | |
|------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|----------|
| | (1) | (2) | (3) | (4) | (5) | (1) | (2) | (3) | (4) | (5) |
| Constant | -63.11* | -31.38 | -22.96 | 20.19** | -57.49** | -4.14*** | 2.41* | -2.28** | 0.88*** | -2.73** |
| | (32.40) | (25.99) | (26.85) | (8.02) | (24.96) | (1.23) | (1.23) | (1.00) | (0.31) | (1.33) |
| LAGROE/ROA | 0.26*** | 0.25*** | 0.39*** | 0.26*** | 0.27*** | 0.28*** | 0.40*** | 0.37*** | 0.32*** | 0.19*** |
| | (0.07) | (0.07) | (0.080) | (0.07) | (0.07) | (0.06) | (0.06) | (0.07) | (0.06) | (0.06) |
| SIZE | 5.33*** | 3.50** | | | 5.18*** | -0.17*** | -0.12* | | | -0.17* |
| | (1.61) | (1.58) | | | (1.52) | (0.06) | (0.07) | | | (0.09) |
| OBS | | | -0.26 | -0.11 | | | | -0.03 | -0.01 | |
| | | | (0.54) | (0.44) | | | | (0.02) | (0.02) | |
| DEP | 0.03 | 0.05 | | -0.06 | | 0.001 | 0.01** | | 0.002 | |
| | (0.05) | (0.05) | | (0.06) | | (0.002) | (0.002) | | (0.002) | |
| CAP | | | 0.68* | 0.19 | | | | 0.004 | 0.05*** | |
| | | | (0.35) | (0.28) | | | | (0.01) | (0.01) | |
| LIQ | 0.02* | | 0.16 | | | 0.02*** | | 0.02** | | |
| | (0.02) | | (0.17) | | | (0.004) | | (0.01) | | |
| BADEBT | -0.81** | -0.70* | -1.17*** | | -0.84** | -0.04*** | -0.03* | -0.05*** | | -0.04*** |
| | (0.37) | (0.37) | (0.44) | | (0.36) | (0.01) | (0.02) | (0.02) | | (0.01) |
| IRS | 1.98 | | 3.26 | | 2.30 | 0.44*** | | 0.43*** | | 0.48*** |
| | (1.76) | | (2.34) | | (1.62) | (0.08) | | (0.11) | | (0.08) |
| CI | -0.13*** | -0.13*** | | -0.13*** | -0.13*** | -0.01*** | -0.01*** | | -0.004*** | -0.01*** |
| | (0.02) | (0.02) | | (0.02) | (0.02) | (0.001) | (0.001) | | (0.001) | (0.001) |
| STAFF | | -3.19 | | -5.61* | | | -0.42*** | | -0.63*** | |
| | | (2.75) | | (2.95) | | | (0.12) | | (0.12) | |
| LOAN | | 0.09 | | 0.16 | | | -0.0002 | | 0.01 | |
| | | (0.13) | | (0.15) | | | (0.01) | | (0.01) | |
| NII | 0.23 | 0.12 | -0.28 | | 0.24 | 0.01** | 0.01 | 0.004 | | 0.01* |
| | (0.16) | (0.13) | (0.20) | | (0.15) | (0.01) | (0.01) | (0.01) | | (0.01) |
| CONC5 | 0.05 | 0.09 | 0.45 | | | 0.01 | 0.02 | 0.02 | | |
| | (0.35) | (0.36) | (0.47) | | | (0.01) | (0.02) | (0.02) | | |

| | | | | | | | | | | |
|--------------------|------------------|------------------|------------------|------------------|--------|-----------------|----------------|----------------|----------------|--------|
| GDPG | 21.98 (27.44) | 35.23 (27.79) | 35.78 (36.34) | 50.37 (31.06) | | -0.83 (1.00) | 1.47 (1.12) | 0.36 (1.28) | 2.34 (2.16) | |
| Adj.- R^2 | 0.5196 | 0.5202 | 0.2867 | 0.4890 | 0.5311 | 0.6639 | 0.6235 | 0.4504 | 0.6652 | 0.6236 |
| Obs. | 122 | 122 | 110 | 110 | 122 | 122 | 122 | 110 | 110 | 122 |
| F-statistic | 14.08 | 14.12 | 5.86 | 14.03 | 23.85 | 24.90 | 21.04 | 10.92 | 28.08 | 34.42 |
| Prob(F-stat.) | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hausman test | | | | | | | | | | |
| χ^2 statistic | 10.94 | 6.81 | 9.79 | 11.07 | 9.37 | 21.72 | 19.75 | 14.23 | 16.10 | 18.19 |
| Prob(χ^2) | 0.3618 | 0.7431 | 0.4029 | 0.3976 | 0.1536 | 0.1541 | 0.3160 | 0.1327 | 0.1409 | 0.2558 |

Notes:

Standard error in parentheses.

*** Significantly different from zero at the 1% level.

** Significantly different from zero at the 5% level.

* Significantly different from zero at the 10% level.