WHAT DETERMINES THE FOREIGN OWNERSHIP SHARE

OF A COUNTRY'S BANKING ASSETS?

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A Thesis

Submitted to

the Graduate Faculty of

Auburn University

in Partial Fulfillment of the

Requirements for the

Degree of

Master of Science

Auburn, Alabama
December 19, 2008

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Ping Liang, daughter of Yingrui Liang and Mingping Luo, was born on October 19, 1984, in Guangdong, China. She graduated from The Second High School of Zhanjiang in 2003. She attended Liaoning University for undergraduate study in September 2003, majoring in international economics and trade, and graduated with a Bachelor of Arts degree in economics in June 2007. She was enrolled in the Master of Science in economics program at Auburn University in Auburn, Alabama, from August 15, 2007 until December 19, 2008.

THESIS ABSTRACT

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Master of Science, December 19, 2008
(B.A., Liaoning University, 2003)

69 Typed Pages

Directed by James R. Barth

The General Agreement on Trade in Services (GATS) is an important new element in the international framework that affects the regulation of the financial sector of every World Trade Organization (WTO) member and all potential members. The opening of financial markets in countries to foreign entry is an important goal of this agreement. To a large degree, the foreign ownership share of a country's banking assets reflects whether this goal is being achieved.

In this thesis, the focus goes beyond the profitability factors, the economic factors, and the political factors that affect the foreign ownership share of a country's bank assets. It does so by examining the extent to which legal and regulatory factors impede foreign entry into a country's banking industry. The results of this paper are

mainly based on the estimation of the following six groups of datasets: market-openness data, regulation data, governance data, performance and market-structure data, depositor protection data, and macroeconomic data.

The primary contribution of this study is to use new and comprehensive cross-country datasets on market-openness and regulation to study foreign expansion into a country's banking industry. In this thesis, I also provide a general picture of how and to what degree other important controlling factors affect the foreign ownership share of a country's banking assets. In this respect, the analyses presented here extend the recent work in the increasingly recognized important area of research on globalization of financial market.

Keywords: foreign ownership of a country's banking assets, regulation, governance, market openness index

ACKNOWLEDGMENTS

The author would like to offer a special thanks to Dr. James R. Barth for his mentoring, patience, and thoughtful direction for the thesis, and for the countless inspiring lessons about both academics and life during the past year at Auburn University. Sincere thanks also go to Dr. Daniel M. Gropper and Dr. Steven B. Caudill for the counsel and direction they provided as committee members as well as their considerate help with my study in Auburn. Appreciation is also given to Ms. Claire T. Feild for the devotion she showed while editing this thesis. Much-deserved gratitude is expressed to my parents for their unselfish encouragement and financial support for my educational pursuits. The author is eternally grateful for the patient help of Holly Mead, Hao Li, and Jesse Adams during the thesis writing process.

Style manual or journal used: *American Economic Review*

Computer software used: SPSS 15.0, Eview 5.0, Microsoft Excel 2003, Microsoft Word 2003

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CHAPTER I

INTRODUCTION

Within a country's banking system, ownership is an important "banking environment" factor that has a bearing on the design and effectiveness of the regulation and supervision of banks. Specifically, banks may be government-owned, foreign-owned, or domestically owned. It is therefore important to study the extent that foreign-owned banks operate in different countries. It is all the more important to do so because about 150 countries around the world have become members of the World Trade Organization (WTO) and thereby have agreed in principal to pursue actions that lead to the opening of their banking sectors to foreign entities.

The foreign ownership share of a country's banking assets is an important indicator of the degree of the openness of a country's banking industry to foreign entry. One challenge that faces a host country's domestic banks is the greater competition generated by foreign-owned banks. A greater foreign-owned banking presence provides the host-country supervisors with additional challenges in terms of developing a comprehensive understanding of the operations of foreign banks and the potential for destructive competition. It may also make it more difficult to resolve some jurisdictional issues that may arise when problems develop. However, foreign-owned banks may also produce benefits for host country. For instance, foreign

banks may create additional beneficial competition as well as promote more effective supervision in the banking industry of the host country. Also, foreign-owned banks may bring various management practices and technologies that help the host country. Furthermore, a greater foreign ownership share may simply reflect the inevitable globalization of a country's financial market when foreign entry barriers are lowered, if not eliminated. For these reasons, the foreign ownership share of a country's banking assets is attracting increasingly greater attention around the world. Many economists, in particular, have recently been trying to determine the various factors that help to explain the foreign ownership share of the banking assets within a country. In this thesis, I follow these earlier studies and rely on explanatory factors that are based on the expanded profitability opportunities for foreign-owned banks, the economic and political environmental factors that foreign-owned banks face when entering other countries. However, most importantly, these factors include new market-openness and regulatory factors in this thesis. Specifically, the main contribution of this thesis is the use of the comprehensive datasets, including a new market-openness index and a new regulation datasets for a large set of countries, to analyze the foreign ownership share of a country's banking assets.

The thesis is organized as follows: Chapter II provides a brief literature review of earlier research into the foreign-ownership share of banking assets in countries. Chapter III describes the sources of the datasets used for the empirical work in this thesis. Also, in this chapter the variables are defined and classified into six groups.

Chapter IV describes the seven regression models (six separate models and one comprehensive model) used in examining the foreign-ownership share, presents the empirical results, and then discusses the results of the different models. Chapter V concludes with a summary of the importance of the findings.

CHAPTER II

LITERATURE REVIEW

The foreign ownership share of a country's banking assets, as an important indicator of the openness of the banking industry, is affected by various factors. The current research has focused these three explanations: profitability opportunities, bank-specific factors, and economic and political environmental factors.

The first focus is the potential profitability opportunities through expansion to a foreign-owned bank which, for example, is captured by the net interest margin of banks in a country. One paper (Claessens, Demirgüç-Kunt, and Huizinga, 1998) concentrates on comparing the net interest margin of banks in developed and developing countries based on bank-level data. They argue the following:

> "A main finding is that foreign banks tend to have higher interest margins, profitability, and tax payment than domestic banks in developing countries, while the opposite is true in developed countries. This suggests that the reason for foreign entry, as well as the competitive and regulatory conditions found aboard, differ significantly between developed and developing countries." (18)

Also in this paper, Claessens, Demirgüç-Kunt and Huizinga (1998) point out that the fraction of foreign entry applications rejected by the regulatory agency may not accurately measure excessive regulatory impediments to foreign bank entry. If foreign

banks expect a country to reject foreign entry applications, they (i) may be reluctant to apply or (ii) may use bribes and other measures prior to submitting an application under these conditions. Thus, a low rejection rate does not reflect bribes and other obstacles faced by foreign banks. Second, there may be sound prudential reasons for rejecting foreign banks that are not well managed and not properly supervised in their home countries. Therefore, a high rejection rate may not indicate excessive entry barriers. Based on these arguments, the foreign denial variable is not included in the empirical analysis.

Earlier research also take into account bank-specific factors, such as the size of a bank, bank equity, bank overhead, fee income, bank liquidity, and bank risk. One paper (Levine, 2003) points out that these bank-specific factors can be used as control variables to analyze foreign bank entry. In another paper based on bank-level data (Clark et al., 2001), an analysis of foreign entry focuses on the size of the bank, the location of the bank, and bank efficiency. In this paper, they point out that there is a positive correlation between the size of banks and their degree of globalization. Moreover, in some regional research, cited by them similar findings are obtained for the case of foreign banks in Australia. In a recent study of the activities of foreign banks in 28 Organization for Economic Cooperation and Development (OECD) countries, Focarelli and Franco (2000) also find direct evidence that a bank's size, as measured by total assets, is positively correlated with its degree of internationalization. With respect to efficiency comparisons, several studies, such as Berger et al. (2000),

and Parkhe and Miller have found that foreign-owned banks are, on average, less efficient than domestic banks in developed host nations. Barajas, Steiner, and Salazar (1999) compare the performance of foreign-owned banks versus domestic banks in Colombia from 1985 to 1998. They find that foreign-owned banks, regardless of whether they were originally owned by nationals or not, have fewer non-performing loans, lower reserve requirements, and are more productive. In this study, several bank-specific measures, as well as environmental variables are examined to assess whether they affect the degree of openness of a country's banking industry.

The third aspect relating to the foreign ownership share of a country's banking assets concentrates on external factors facing those banks, such as the economic and political environment, and regulation foreign bank face, and how these factors affect the degree of foreign ownership in a country. In this regard, in their paper "The Regulation and Supervision of Banks Around the World," Barth, Caprio, and Levine (2001) provide and discuss a new and comprehensive database on the regulation and the supervision of banks in 107 countries. In 2006, they published an update of the database in their book "Rethinking Bank Regulation: Till Angels Govern" (Barth, Caprio, and Levine, 2006). The database offers the first and most comprehensive cross-country assessment of the impact of bank regulation on the operation of banks. Also provided is an empirical evaluation of the historic debate about the proper role of government in an economy by studying the role of politics in determining regulatory approaches to banking. Barth et al. (2006) point out that viewing reform of bank

regulation and supervision as a narrow technical issue is risky because the design and impact of bank regulation reflects host countries' complex economic and political institutions.

Another important work that related to examine the effect of the political environment on foreign banking operations is the Worldwide Governance Indicators (WGI) Project[1], which provides a database containing a measure of governance[2]. The authors present an index of governance published in the volumes, "Governance Matters" to "Governance Matters VI" (Kaufmann, Kraay and Zoido-Lobaton, 1999b, 2002a), and (Kaufmann, Kraay, and Mastruzzi, 2003, 2005, 2006a, and 2006b). The indices focus on six dimensions of governance: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. In a recent paper "Governance Indicators: Where Are We, Where Should We Be Going?" Kaufmann and Kraay (2007) generalize the objectives and methods used to construct and analyze these governance indices. Kaufmann and Kraay (2007) quoting Albert Einstein, point out the limiting

[1] The Worldwide Governance Indicators (WGI) project reports aggregate and individual governance indicators for 212 countries and territories over the period 1996–2006, for six dimensions of governance: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption. The aggregate indicators combine the views of a large number of enterprise, citizen, and expert survey respondents in industrial and developing countries. The individual data sources underlying the aggregate indicators are drawn from a diverse variety of survey institutes, think tanks, non-governmental organizations, and international organizations.

[2] Governance consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them.

imperfections of their indices, saying that “Not everything that can be counted counts and not everything that counts can be counted" (as cited in Kaufmann and Kraay, 2007). Nevertheless, these studies provide a reliable quantitative method to compare governance in different countries.

In another paper, Barth et al. (Forthcoming) attempt to compare WTO members’ commitments to opening the domestic banking sector to foreign firms with actual regulatory practice in a systematic manner on a cross-country basis. The authors examine the extent to which WTO members impose greater restrictions on foreign banking operation relative to domestic banks once foreign entry has occurred. Most relevant for this thesis is that, Barth et al. (Forthcoming) construct a market-openness index by taking into account foreign entry and operation commitments and restrictions. The authors note that developed countries are somewhat less open than their WTO commitments suggest such countries should be, whereas developing countries are, in practice, significantly more open than their WTO commitments oblige them to be. Also, as regard for foreign and domestic bank operates within each set of countries, foreign banks are, on average, at somewhat less of a regulations-related disadvantage relative to domestic banks in developing countries than is the case for developed countries. They and others do not, however, attempt to answer the question as to whether the degree of openness can explain the foreign ownership share of a country’s banking assets

Based on previous research, my study of the foreign ownership share of a country's banking assets is built on earlier analyses of the effect of both specific factors and comprehensive factors of different countries, including profitability, economic factors, and political factors. These factors are captured by 12 variables that are grouped into six different models estimating the specific aspects and then are combined into one comprehensive model to capture the effect of all variables.

CHAPTER III

DATA DESCRIPTION AND VARIABLE DEFINITIONS

There are two sections in this chapter. The first section describes the data sources in the thesis. The second section discusses the definition of each variable included in the thesis and reports the basic descriptive statistics of each variable.

A. DATA DESCRIPTION

There are three primary data sources for the year 2003 that are used in this thesis. The first source is the bank regulation and supervision database provided in *Rethinking Bank Regulation: Till Angels Govern* (Barth, Caprio, and Levine, 2006). The database is based on the World Bank Surveys I and II[3] conducted in years

[3] In 1998, funded by the World Bank, the first survey was designed and then implemented to collect detailed and comprehensive information on the regulation and supervision of commercial banks. The survey is comprised of twelve separate parts, with 175 questions, covering the following 12 aspects of a country's banking system: Entry into Banking, Ownership, Capital, Activities, External Auditing Requirements, Internal Management/Organizational Requirements, Liquidity and Diversification Requirements, Depositor (Savings) Protection Schemes, Provisioning Requirements, Accounting/Information Disclosure Requirements, Discipline/Problem Institutions/Exit, and Supervision. Responses were received from 107 countries. However, many of these countries did not respond to each and every question. Survey II was conducted in years 2001/2002.The second survey differs from the first in the following areas: a) Several questions in the first survey for which the response rate was low, or for which it was difficult to get accurate information (e.g. estimates of compensation of private-sector bankers, either in absolute terms or relative to bank supervisors) were dropped; b) Questions or subcategories were added in a very few instances; c) New questions were introduced in the areas of deposit insurance and regarding the corporate governance of banks; and d) The next most noticeable difference is an expanded number of countries—151 countries in the 2003

1998/1999 and 2001/2002. The World Bank Surveys were sent to national bank regulatory and supervisory authorities by World Banks. In 2001, Barth, Caprio and Levine published the first paper "The Regulation and Supervision of Banks Around the World: A New Database" that provides details about the survey and the database. Since that time the bank regulation and supervision database has been available to researchers and policy makers. The update of this database is provided by Survey II, which characterized the regulatory situation at the end of 2002, for 152 countries. This database is the major data source in this thesis. The database allows for the identification of the existing regulation and supervision of banks, as well as selective features of bank structure and deposit insurance schemes for a broad cross-section of countries.

The second data source is the governance database from The Worldwide Governance Indicators (WGI) project. This database is described in the paper "Aggregating Governance Indicators" (Kaufmann et al. 1999a). In the past 8 years, the database has been updated six times in a series of papers titled "Governance Matters" (Kaufmann et al., 1999b, 2002a, 2003, 2005, 2006a, and 2006b). In these papers, Kaufmann et al. construct the governance indicators reporting aggregate and individual governance indicators for 212 countries and territories. These indicators play a significant role in synthesizing and summarizing the large variety of existing individual governance indicators. More importantly, this database provides an

database as of its release date (March 2004), compared with 107 (ultimately, 117) countries in the original database.

important source for the political factors taken into account in my research on the foreign ownership share of various countries' banking assets.

A third source of data is the market-openness index from the paper "Are Countries Fulfilling Their WTO Commitments on Foreign Bank Entry? A Cross-Country Analysis of Openness and Discrimination" (Barth et al. forthcoming). This index provides a new and comprehensive measurement of the openness of a country's banking sector. Thus, it is included as an important variable in the analysis of foreign bank ownership share of a country's banking assets.

The data I use in this thesis are on country level, covering 151 countries in the world, ranging from rich to poor and including all regions.

B. VARIABLE DEFINITIONS

The dependent variable in this analysis is Foreign-Owned Banks Share (FORBANK), which is obtained from the bank regulation and supervision database. This dependent variable measures the extent to which a country's banking assets are foreign owned, and this variable is expressed in a percentage. A bank is considered to be foreign owned if more than 50 percent of its assets are owned by a foreign entry. The summary statistics of the data is provided in Appendices, Table 4. There is a wide variation in reported percentage of foreign ownership share across countries. From Table 4, we know that Belgium, Denmark, and Kuwait have no foreign ownership share, that is, the percentage of foreign-owned banks is zero. Estonia and New Zealand have an extremely high percentage of foreign ownership; which is more than

98 percent. Further, some countries, such as Botswana and Lesotho, have 100 percent foreign ownership, which means that they essentially have outsourced their entire banking sector to foreign banks. The average value of the foreign-owned bank share is 43.58 percent among the 131 countries including in this thesis. The focus of my thesis is what determines the foreign ownership share of a country's banking assets in various countries.

There are 12 independent variables used in this thesis. According to the database and the characteristic of the variables, I classify them into six groups.

The first group is the market-openness group, which consists of only one variable—the market-openness index (MOINX). The MOINX is the degree of overall openness to banking entry and the range of permissible activities. This is a new and comprehensive cross-country dataset provided in paper "Are Countries Fulfilling Their WTO Commitments on Foreign Bank Entry? A Cross-Country Analysis of Openness and Discrimination" (Barth et al. forthcoming), concerning the openness of WTO member's financial market. A low index value indicates greater openness or less restrictiveness (Barth, et al., forthcoming). The MOINX measurement is based on the analysis of the entry and licensing of banks, forms of entry, permissible activity, and banking system characteristics. Basically, MOINX is a comprehensive index that provides us a general indicator of the degree of openness of a country's financial market. The value of the market openness index of the 64 observations ranges from 0 to 61.30 with an average 26.31, indicating a large variation of this variable.

The second group comprises regulation variables, including Overall Activities Restrictiveness (OVER3AR), Official Supervisory Power (OSPOWER), and Independence of Supervisory Authority—Banks (INDBANK). These datasets come from the bank regulation and supervision database.

The OVER3AR is the variable measuring the regulatory restrictions on bank activities. There are three regulatory sub-variables that determine the extent of important activities in which banks may engage. The three sub-variables involve regulation and restriction on securities, insurance, and real estate activities. The dataset created by Barth, Caprio, and Levine (2001) specifically measures the degree to which the national regulatory authorities in countries allow banks to engage in the following three fee-based, rather than more traditional interest spread-based, activities:

> "(a) Securities: the ability of banks to engage in the business of securities underwriting, brokering, dealing, and all aspects of the mutual fund industry.
>
> (b) Insurance: the ability of banks to engage in insurance underwriting and selling.
>
> (c) Real Estate: the ability of banks to engage in real estate investment, development, and management." (13)

The original data coming from the survey conducted by the World Bank provide information in response to a series of individual questions regarding each country's regulations concerning the securities, insurance, and real estate activities. Based on

survey information in these three areas, the degree of regulatory restrictiveness for each aggregate or composite activity has been quantified on a scale from 1 to 4[4], with larger numbers representing greater restrictiveness. The OVER3AR is the summation of restrictions on securities, insurance, and real estate activities in a country. The minimum value of this variable is 3, indicating that all observations in my analysis, more or less, have some restriction on banks' activities in security, insurance and real estate. Among the 151 countries in this dataset, the average value of OVER3AR is 7.21.

The OSPOWER measures whether the supervisory authorities have the authority to prevent and correct problems, with a higher value indicating more power. Once a bank is operating within the regulatory environment, it is subject to monitoring and control by various official supervisory actions. This variable captures quantitatively the degree to which supervisory authorities may intervene to promote a "safe and sound" banking industry. Among the 150 observations of this variable, the value of OSPOWER ranges from 4 to 14. The average value of this variable is 10.48, indicating that in these 151 countries, the officials have relatively high supervisory power.

The INDBANK measures the degree to which the supervisory authority of a banking system is protected by the legal system within the banking industry. This variable captures the independent supervisory power of banks within a country. The

[4] For more detail refer to the Appendices, Table 1.

value of this variable depend on the question: Are supervisors legally liable for their actions? The value of INDBANK equal to zero, if one answers yes. Otherwise, the value of this variable is one. Among the 149 countries, there are 55 countries without the legal system to protect the supervisory authority of their banking system.

The third group comprises of the external political governance variables, including Voice and Accountability (GVOICE), Political Stability and Absence of Violence (GPOLS), and Rule of Law (GRULE). These variables come from the database of the Worldwide Governance Indicators (WGI) project. These three variables represent the political environment and the governance situation faced by foreign-owned banks when they enter a country.

The variable, GVOICE, measures the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and freedom of the press. The larger the number, the more freedom in political activities the citizens in that country may possess. The value of this index ranges from -1.81 to 1.61 in the 141 observations I obtain. The average value of this varible is 0.12.

The variable, GPOLS, measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism. Thus, GPOLS variable measures the political stability of a country. The larger the number the more stable the government is. The value of this index ranges from -2.21 to 1.69, with an average 0.08.

The variable, GRULE, measures the extent to which agents have confidence in and abide by the rules of society. In particular, it represents the quality of contract enforcement, the quality of police, and the quality of courts as well as the likelihood of crime and violence. The larger the number, the better the legal system is in a country. Thus, the laws governing finance market are relatively secure and are enforced strictly in a country with a high GRULE value. The value of this index ranges from -1.67 to 1.97, with an average 0.10 among 141 observations.

The fourth group includes the performance and the market structure variables. The share of deposits held by the five largest banks (DEBYFIV) and the net interest margin-to-assets ratio (NIMTOAR) belong to this group. Data on these two variables comes from the bank regulation and supervision database.

The DEBYFIV is the share of deposits held by the five largest banks within the host country, and this variable is measured as a percentage, representing the bank's concentration ratio within host countries. In some countries this ratio is 100 percent, such as in Aruba, Bhutan, and Botswana, which indicates that these countries may have only five or fewer banks. This indicates a strong banking concentration in those countries. However, in some other countries, this ratio is less than 30 percent. For instance, in the United Kingdom, it is about 24 percent, and in the United States, it is about 29 percent, which indicates that there is a relatively weak banking concentration within these countries because there are numerous banks competing in these countries' financial market. Among the 130 observations, the average value of

DEBYFIV is 73.03 percent.

The net interest margin-to-assets ratio (NIMTOAR) equals interest income minus interest expense divided by interest-bearing assets. In this study, the net interest margin-to-assets ratio is the proxy for the profitability of a bank. Therefore, the higher the ratio, the better the performance of a foreign-owned bank is. The net interest margin measures the gap between what the bank pays the providers of funds and what the banks receives from firms and other users of bank credit. Since the net interest margin focuses on the conventional borrowing and lending operations of banks, I use interest-bearing assets rather than total assets in this dataset. Among the 123 observations I obtain, the value of NIMTOAR ranges from 0.04 to 14.80, with an average 3.97.

The fifth group is the depositor protection variable, which includes only one variable: a dummy variable indicating the presence of an explicit deposit insurance scheme (EDIS). This variable refers to whether there is an explicit deposit insurance protection system and, if not, whether depositors were fully compensated the last time a bank failed. If a country answers “No” to both questions, the value of EDIS is equal to 1; otherwise, it is equal to 0. Regulations and supervisory practices clearly are important parts of a banking system, but they do not operate in a vacuum. Instead, their effects on various economic outcomes may depend importantly on the existence (or lack thereof) and features of a country’s deposit insurance scheme. Deposit insurance schemes are one component of a financial system’s safety net that

contributes to the promotion of financial stability. The purpose of deposit insurance varies from one country to another, but in most cases, the deposit insurance is designed to contribute to financial stability and to protect less financially sophisticated depositors. There are currently 118 countries with an explicit deposit insurance scheme, such as the Federal Deposit Insurance Corporation (FDIC) in the United States, Canada Deposit Insurance Corporation (CDIC), Deposit Insurance Agency (DIA) in Russia, and Korean Deposit Insurance Corporation (KDIC), among others. To effectively insure depositors, deposit insurance must to some degree supervise the behavior of commercial banks. For instance, the FDIC may, after notice and a hearing, terminate the insured status of a bank that continues to engage in unsafe banking practices. The FDIC will regulate the manner in which the depository institution gives the required notice of such a termination to depositors. In this thesis, EDIS captures the type of the deposit insurance regime that foreign-owned banks face, and explains how this system affects the behavior of such banks with respect to entering a country. Among the 151 observations in my analysis, there are 93 countries have an explicit deposit insurance scheme.

The last group consists of country-specific macroeconomic variables, including GDP per capita (GDPPCAP) and the ratio of banking assets to GDP (BAGDP).

Currently, the GDPPCAP is a widely accepted measurement of a country's development. In my analysis I use it as the proxy for the economic development of a country; also, I estimate its effect on foreign bank ownership. There is a large

variation in GDP per capita in different countries, ranging from the highest one, 52424.49 dollars in Luxembourg, to the lowest one, 144.50 dollars in Burundi. The average GDP per capita of 143 observations is 9016.09 dollars.

BAGDP is the ratio of a country's banking assets to the GDP of the country. This variable captures the significance of the banking system within a country, thus indicating what type of financial market a country has. If a country has a large BAGDP ratio, banks play a significant role in the financial market in that country, and we may consider it to be a bank-oriented country. In this type of country, the businesses would rely mainly on loans from banks rather than issuing stocks or bonds in the capital market for their funding. Banks, therefore, play the leading role in the financial market. Among the 137 observations, the average value of BAGDP is 285.92. In this dataset, 50 countries out of 138 have ratios larger than 100 percent, including Luxembourg, Switzerland, Germany, and United Kingdom, and among others. These countries have a highly bank-oriented financial market. On the other hand, in some other countries this ratio is relatively low. For example, in the United States, the ratio is 64 percent, suggesting that the United States has a more capital-oriented financial market in which businesses mainly obtain funding. When comparing bank-orientated and capital orientated countries, foreign-owned banks may have more room for operating and thus more opportunities for making profits in the bank-orientated countries.

The details regarding definitions of variables are given in the Appendices, Table 1. The summary of statistics about all variables is given in Appendices, Table 2, from which we notice that there is a large variation in the number of observations, ranging from 64 to 151. To obtain more precise results, I use all of the observations available to me to estimate all the models in this thesis.

CHAPTER IV

MODELS AND EMPIRICAL RESULTS

In this chapter a general model of factors that affect the foreign ownership share of a country's banking assets is provided. Foreign ownership share is posited to be a function of 1) market-openness, 2) regulation, 3) governance, 4) market structure and performance, 5) depositor protection, and 6) macroeconomic factors. More specifically, foreign ownership share is modeled as a function of following 12 variables:

FORBANK = f (MOINX; OVER3AR, OSPOWER, INDBANK; GVOICE, GPOLS, GRULE; DEBYFIV, NIMTOAR; EDIS; GDPPCAP, BAGDP) .

The first step in the analysis is to identify any simple correlation between the variables to be used in later regressions. Correlation between the independent variables will lead to possible multicollinearity problems in my regressions, so I carry out analyses of the variance inflation factors (VIF) to determine the severity of the multicollinearity problem. The results of the VIF tests are reported in Appendices, Table 5.

After confirming the VIF results, in the second part of this chapter I perform six separate regressions for each group of variables. The reason for estimating the separate regressions is that when all the variables are included in the comprehensive

model, the number of observation still sufficient for estimation purposes drops by more than 50 percent. The separate regressions, therefore, are necessary to obtain an indication as to whether many of the postulated variables have an effect on foreign ownership share, which is more difficult to assess with just the comprehensive model due to the possible multicollinearity problems and limited observations for performing group F-test.

In the last part, I estimate a comprehensive regression based on all the combined variables and include all the variables in Model 7. The regression results of the seven models are reported in the Appendices, Table 6.

A. CORRELATION AND VARIANCE INFLATION FACTOR (VIF) TEST

Based on the table of Correlation Among the Variables (Appendices, Table 3), one can observe that the correlations between some variables are statistically significant at one percent level. For instance, the MOINX is correlated with OVER3AR, and GPOLS. OVER3AR is correlated with INDBANK, GRULE and GDPPCAP. OSPOWER is correlated with DEBYFIVE. GVOICE is correlated with GPOLS, GRULE, NIMTOAR, and GDPPCAP. GPOLS is correlated with GRULE, NIMTOAR, and GDPPCAP. GRULE is correlated with NIMTOAR and GDPPCAP. DEBYFIV is correlated with EDIS. NIMTOAR is correlated with GDPPCAP. These correlation value indicate the possibility of multicollinearity problems for the models. To test the severity of multicollinearity, I perform the variance inflation factor (VIF) tests for the seven different models. The results of the VIF tests are listed in

Appendices, Table 5. From this table, we notice that the VIF statistics for all variables in all seven models[5] are smaller than 10, ranging from 1 to 6.408. As a rule of thumb, if the VIF is greater than or equal to 10, the variable has been proposed as a cutoff variable. The VIF test results for all my models indicate that the multicollinearity problem is not too severe among the variables in these seven models. Therefore, the coefficients of the variable in these regressions, to a large degree, reflect the true effect of the variables. That is, their effects have not been diluted too greatly by the collinearity between the variables. Therefore, no correction for multicollineariry problem is needed in my models.

B. EMPIRICAL RESULTS

a) Model 1: Market Openness Model and Regression Results

This model can be expressed as follows:

(1) $FORBANK = \alpha + \beta_1 MOINX + \mu$.

From Table 6, Model 1, the coefficient of MOINX is -0.91, and the t-statistic shows that this coefficient is statistically significant from zero at the one percent level. This result verifies the importance of the market-openness variable. According to the

[5] Variables included in
Model 1: MOINX
Model 2: OVER3AR, OSPOWER, INDBANK
Model 3: GVOICE, GPOLS, GRULE
Model 4: DEBYFIV, NIMTOAR
Model 5: EDIS
Model 6: GDPPCAP, BAGDP
Model 7: MOINX, OVER3AR, OSPOWER, INDBANK, GVOICE, GPOLS, GRULE, DEBYFIV, NIMTOAR, EDIS, GDPPCAP, BAGDP

definition of the MOINX, the lower the value, the less restrictive a country's financial market is, with respect to foreign entry. The result confirms that foreign ownership share of a country's banking assets is positively related to the market openness, which means that it is negatively related to the market-openness index (MOINX). That is, countries that have lower MOINX values, indicating higher market openness, have larger foreign ownership share in the bank sector. In countries with low market-openness index, there are lower initial capital requirements, foreign equity limitations, and fewer limitations on the composition of the board of directors. Without these complicated and strict requirements, foreign-owned banks face lower barriers for entry. Accordingly, foreign-owned banks may more easily enter to take advantage of profit-making opportunities to expand abroad. Also from Appendices, Table 6, we see that the R^2 of this model is 0.11, meaning this model explains about 11 percent of the variation of foreign ownership share of a country's bank assets. This results confirms the importance of the new and comprehensive market-openness index.

b) Model 2: Regulation Models and Regression Results

This model can be expressed as follows:

(2) $FORBANK = \alpha + \beta_2 OVER3AR + \beta_3 OSPOWER + \beta_4 INDBANK + \mu.$

This model controls for the effects of the regulation factors. From Table 6, Model 2, we observe that the coefficient of OVER3AR, β_2, is -0.56, which means restrictions on security, insurance, and real estate activities are negatively associated with foreign

ownership, but this effect is not statistically significant. Turning to the factor OSPOWER, the coefficient β_3 is 1.48 and is statistically significant at the ten percent level, which shows that more official supervisory powers encourage foreign entry. Having more supervisory powers contributes to supervisors being able to handle and correct problems in the banking system. Strong official supervisory power may help to construct a sound environment for the banking industry, which should be of great importance for foreign-owned banks. Regarding the INDBANK variable, its coefficient is 20.69 and is statistically significant from zero at the one percent level, suggesting that the greater independent supervisory authority over banks contributes to a larger foreign ownership share. Therefore, banks in such countries may be less susceptible to the potential political interference. If so, banks have more opportunities to expand financial and business operations and thus more profit opportunities. When referring to the R^2, we know that this model explains about 8 percent of variation of the foreign ownership share of a country's banking assets. Regarding to the whole model, the F-statistic is 4.68, which is statistically significant at the one percent level. This result means even though the OVER3AR is not statistically significant, when OVER3AR, OSPOWER, and INDBANK are taken together, there is at least one of the three variables is statistically significant from zero. For this reason, the whole model has significant explanatory power.

c) Model 3: Governance Model and Regression Results

This model can be expressed as follows:

(3) FORBANK= α+ β_5 GVOICE + β_6 GPOLS+ β_7 GRULE + μ.

In this model, I intend to explain the effect of the political environment on foreign ownership share of a country's banking assets. The regression results indicate that coefficients of GVOICE and GPOLS are 6.83 and 25.76, respectively, which are positive and statistically significant from zero at ten and one percent level, respectively. Obviously, the voice and accountability of the government and the political stability (GVIOCE) and the absence of violence (GPOLS) within host countries suggests the stability of a country, which is of great importance for foreign bank entries. Indeed, a stable political environment is closely related to the ability to perform normal operations and pursue the existent opportunities for making profits.

As expected, a strict rule of law (GRULE) will have a negative effect on the foreign ownership, which was reflected by the negative coefficient -28.15, and its t-statistic being statistically significant at the one percent level. The great negative effect of the GRULE on the foreign ownership share of a country's banking assets is because rigid law and rules restrict the activities and profit opportunities, for banks in the host country. For example, in some developing countries the financial market is relatively undeveloped, so rules and regulations may be less restrictive. In this case, foreign-owned banks may have a greater chance to assess different financial activities. Compared with developing countries, a developed country may have a relatively wholesome and restrictive legal and regulation system. This system, on one hand, helps to prevent the political and financial environment from disorder, but on the

other hand, limits some banking activities of foreign-owned banks. Thus, law and rules may act as the deterrent for foreign entry because compliance of these law and rules may induce certain extra costs for foreign-owned banks. As a result, foreign-owned banks may prefer to operate in some developing countries with immature, but fewer restrictions on financial markets.

The F-statistic of this model is 11.28, and is statistically significant from zero. This results indicates that when all three governance variables are included in one model, there are at least one of the coefficient of these variables are statistically significant from zero. Therefore, this model has a strong explanatory power. Turning to the R^2 which is 0.20, we know that the model including the three governance variables can explain about 20 percent of the variation of foreign ownership share of a country's banking assets. Thus, the governance factors indeed play an important role in explaining the degree of foreign bank entries.

d) Model 4: Market Structure and Performance Model and Regression Results

This model can be expressed as follows:

(4) $FORBANK = \alpha + \beta_8 DEBYFIV + \beta_9 NIMTOAR + \mu$.

In this model, DEBYFIV is a proxy for the market structure of a country, thus capturing the bank concentration in a country. The coefficient is 0.37 and is statistically significant at the one percent level. This result indicates that countries with a lower concentration of banking may deter foreign bank entry because of

substantial domestic competition. In such countries, the deposits are relatively dispersed, thus foreign-owned banks may have fewer opportunities to grow their banking businesses, even though the foreign-owned banks might be in the top five banks in these countries. Foreign banks may regard this situation as a considerable challenge for pursuing profitable opportunities and may turn to other more profitable countries.

The variable, NIMTOAR, is a proxy for the performance of a bank. Net interest margin is a major indicator of the profitability of a bank. If profitability within one country is extremely high, there is no doubt that foreign banks will compete to enter this financial market to pursue profits. Otherwise, foreign banks may not consider entering such a financial market. The estimation result indicate that NIMTOAR's coefficient is 0.55, meaning that this variable has a positive effect on foreign ownership share.

e) Model 5: Depositor Protection Model and Regression Results

This model can be expressed as follows:

(5) $ORBANK = \alpha + \beta_{10} EDIS + \mu$.

Depositor protection currently attracts a considerable attention around the world, especially during a time when the economic development is slowing down in many countries. Depositors and financial institutions pay more attention to deposit insurance. Normally, we consider deposit insurance as an attraction for the foreign

bank. However, the regression results show that the coefficient is positive and statistically significant from zero at the one percent level. According to the definition of this variable, a country with an explicit deposit insurance scheme or a fully compensation system for depositors is defined to be 0, otherwise, it is defined to be 1. Thus, this result suggests that the country without this deposit insurance scheme may attract more foreign entry. According to the regression results, a country without the insurance scheme has around 18 percent more foreign ownership share than a country with it. This situation may be occurring because of the complicated requirements to enter the insurance system in such countries. Usually, in the host countries with deposit insurance systems, a bank is required to be a member of the system. The requirements for entry and supervisory regulation for membership are set up by the government or a regulatory institution of the host country, which may lead to hardships for foreign-owned banks. For example, in some developed countries, such as the United States, their domestic banks have high competitiveness around the world. Correspondingly, their deposit insurance systems have stricter requirements which will exclude numerous foreign banks from developing countries even the developed countries. Basically, this negative effect on foreign ownership share of a country's banking assets is because entry and operation costs may be larger than profits foreign-owned banks can make in the host country. Thus, instead of an attraction, this deposit insurance scheme may be a deterrent for foreign entry.

f) Model 6: Macroeconomic Factors Model and Regression Results

This model can be expressed as follows:

(6) FORBANK= α+ β_{11}GDPPCAP +β_{12}BAGDP+ μ.

This model is closely related to the macroeconomic factor, GDP. In this model, the GDP per capita (GDPPCAP) can be viewed as a proxy for the development of a country. In the regression results, the coefficient is negative, -0.01, and statistically significant at the one percent level, which implies that with the increase in the GDP per capita, the foreign ownership share will decrease. We also observe these phenomena in practice. With the development of a country, the competition of the financial market within that country will increase. At the same time, operating efficiency and high quality service provision from banks will become more important. The banks that survive in developed countries usually are more competitive than those in other countries. These highly competitive banks have comparative advantages over most banks in the world. Therefore, these banks, such as Citibank of America, Swiss Bank of Switzerland, and Deutsche Bank of Germany, now pay more attention to expanding their banking business abroad to avoid competition within their own countries. They seek profit-making opportunities elsewhere since these banks may even make more profits outside their own countries. This regression result also supports the results of previous research. Claessens, Demirgüç-Kunt, and Huizinga (2000) find that foreign banks have lower interest margins, lower overhead expenses, and lower profitability than domestic banks in developed countries, while the opposite

is true in developing countries. This result suggests there should be considerable foreign entry in developing countries. Case study evidence of developing countries also indicates that foreign entrants are relatively more efficient than domestic competitors. Barajas, Steiner, and Salazar (2000) compare the performance of foreign-owned versus domestic banks in Colombia from 1985 to 1998. They find that foreign-owned banks, regardless of whether they were originally owned by nationals or not, have fewer non-performing loans, lower reserve requirements, and are more productive. Clarke et al. (2000) find similar performance advantages for foreign banks operating in Argentina in the late 1990s. Bhattacharya, Lovell, and Sahay (1997) find that foreign banks are slightly more efficient than domestic ones in India. In this situation, it is more difficult and less attractive for foreign banks to enter mature financial markets and survive the fierce competition. Thus, GDP per capita, as an indicator of the development of a country, appears to have a negative effect on the foreign ownership share of banking assets. This variable's explanatory power is supported by the t-statistic which is statistically significant at the one percent level.

The variable, BAGDP, measures the importance of banks in the economic system within a country. The coefficient of this variable is positive and statistically significant at the one percent level. This result indicates that the higher the ratio of banking assets to GDP, the greater will be the foreign ownership. According to the coefficient, if the percentage of the ratio of the banking assets to GDP increases one percent the foreign ownership share will increase about 0.01 percent. This is because a high banking asset

to GDP ratio—that is, banking assets account for a large percentage of a country's total GDP—indicates that a country may have a bank-oriented financial market. In the bank-oriented market, banks play an important role in financing and making a loan for businesses. Therefore, there is more scope for the development of a banking business and more opportunity for banks to make a profit, which acts as a great attraction to foreign-owned banks.

The F-statistic of Model 6 is 6.1 and it is statistically significant. This estimation result indicates that at least one coefficient of the two variables, GDPPCAP and BAGDP, in macroeconomic factor model is statistically significant from zero at the one percent level. Therefore this model has strong explanatory power. The R^2 of this model is 0.08, suggesting that these two variables can explain 8 percent of the variation of foreign ownership share of a country's banking assets.

g) Model 7: Comprehensive Model and Regression Results

The most comprehensive model is as follows:

(7) $FORBANK=\alpha+\beta_1 MONIX+\beta_2 OVER3AR+\beta_3 OSPOWER+ \beta_4 INDBANK+ \beta_5 GVOICE + \beta_6 GPOLS+ \beta_7 GRULE+ \beta_8 DEBYFIV+ \beta_9 NIMTOAR+ \beta_{10} EDIS+ \beta_{11} GDPPCAP + \beta_{12} BAGDP01+ \mu.$

In this final model, I include all 12 variables and perform a comprehensive regression.

From the results in Table 6, Model 7, we notice that only the coefficient of

GVOICE changes the sign from the previous results. From the t-statistic of the coefficient of GVOICE, -0.60, we know that this change is not statistically significant. Therefore, this change does not affect the previous results and the explanatory power of Model 7. From Table 6, Model 7, one can observe that there is no change of the sign of coefficient of any other variables, which suggests that all the other variables play the same role without control of other variables. According to t-statistic, the coefficients of the variables OSPOWER, GRULE, DEBYFIVE, EDIS and GDPPCAP become insignificant in the comprehensive model, meaning that the effects of these factors may not be obvious if we do not control the other variables. [6]

However, regarding regression results of MOINX, INDBANK, GPOLS and BAGDP, not only do their coefficients keep the signs, but also the coefficients of these variables are statistically significant from zero. The coefficient of the MOINX is -0.93 and is statistically significant from zero at the one percent level, indicating that a country with higher market-openness index has lower foreign ownership in banking sector. The coefficient of the INDBANK is 11.69, which indicates that if a bank has one more unit of supervisory power, there will be an 11.69 percent increase in the foreign ownership share. The coefficient of GPOLS is positive, 16.76, which implies the political stability and absence of the violence still has important positive effect on the foreign ownership share of banking assets. At last, the coefficient of ratio of the bank assets to GDP (BAGDP) is 0.02, which is significant at the ten percent level.

[6] See Table 7 for the result when only 54 observations are used in the estimation of all sevent models. It will be seen that the results in both tables are generally quite similar.

This regression result indicates that BAGDP, as the sign of the importance of the banking, still plays an important role in determining foreign entry.

The F-statistic for the comprehensive model is 4.22 and statistically significant at the one percent level, which verifies the explanatory power of the comprehensive model. Even though some of the coefficient of variables became insignificant individually, the F-statistics indicates that at least one of these variables in the comprehensive model is statistically significant from zero.

The R-square of this model is 0.55, which implies that the variables I included in this comprehensive model can explain 55 percent of the variation of foreign ownership share of a country's banking assets. The unexplainable parts for this model may be because of the insufficient data. In the process of constructing this model, I cannot collect all data from all countries for all variables. In this final model, I use only 54 observations, which is less than the other six models.

Further, there may be some comprehensive cultural and historical factors that may have a significant effect on foreign ownership share but I do not include them in the model, because currently, there do not exist widely accepted measurements for these cultural and historical factors. Although this model is not a perfect model, these regression results give us at least a general picture of how the market openness, regulation, governance, performance and market structure, depositor protection, and macroeconomic factors affect the foreign ownership share of a country's banking assets.

CHAPTER V

CONCLUSIONS

In this thesis, I construct seven models to determine whether profitability, economic, or political factors can explain the foreign ownership share of a country's banking assets. Most importantly, the focus is on the role played by a new market-openness variable and the regulation variables. The analyses are based on three data sources at the country level, including different political institutions, all types of countries and in different regions of the world. The variables are classified into six groups and are estimated in six separate models as follows: market-openness model, regulation model, governance model, performance and market structure model, depositor protection model, and macroeconomic factors model. Also, I construct a comprehensive model including above six groups of variables. According to the results of the VIF tests on the seven models, I find that multicollinearity is not a significant problem in any models. Thus, no correction for multicollinearity is needed in any of these models.

In the empirical analyses, I estimate a regression model for each group of variables separately, and then I estimate a comprehensive regression model including all 12 variables. The regression results of Model 1 (Appendix, Table 6) indicate that

the factor that allows greater foreign entry allows more market openness. The decrease of MOINX, indicating higher market openness, is associated with an increased foreign ownership share of a country's banking assets. This means that in trying to understand the extent to which banks will expand across national borders, one must take into account legal and regulatory barriers to entry into a country' s banking sector.

According to the regression results of Model 2 to Model 6, the factors that grant more freedom for the foreign-owned banks in the banking activities will increase the foreign ownership share of a country's banking assets. These variables used to examine variation of foreign ownership share of various countries include the Independence of Supervisory Authority—Bank (INDBANK) in the regulation model, Deposits Held by the Five Largest Banks (DEBYFIV), Net Interest Margin-to-Assets (NIMTOAS) in the performance and market structure model, and the Bank Assets to GDP (BAGDP) in the macroeconomic factors model. The use of these variables in examining foreign ownership share derives from the fact that they allow foreign-owned banks more opportunities to be involved in various bank activities in host countries. Thus, foreign-owned banks may have more opportunities for making profit in host countries.

On the other hand, Factors that impede bank operations may discourage foreign entry and thus foreign ownership share. These variables include the Overall Activities Restrictiveness (OVER3AR) in the regulation model, the Rule of Law (GRULE) in

the governance model, the Explicit Deposit Insurance Scheme (EDIS) in the depositor protection model, and GDP per capita (GDPPCAP) in the macroeconomic factors model. OVER3AR restricts the activities in which a foreign-owned bank may engage. GRULE and EDIS represent governmental and regulatory interference in bank operations. Among these variables, GDP per capita controls for the effects of the development of a country on the foreign ownership share of banking assets. A higher GDP indicates a more developed country. In highly developed countries, there is substantial competition in their banking industries, which puts foreign-owned banks in a less competitive situation for banking activities. Currently, many banks in developed countries are expanding into emerging markets to avoid the substantial competition in their home countries and to increase their potential profits in growing and less competitive markets. Such expansion increases foreign-owned banks share of total banking assets in developing countries with relatively low GDP per capita. The results I obtain from the regression on GDPPCAP, confirms this hypothesis. Also, these results are consistent with the previous research.

Further, the external factors that are beneficial to develop sound political and economic environment will contribute to the foreign ownership share of a country's banking assets. These external factors include the following: Official Supervisory Power (OSPOWER) in the regulation model, Voice and Accountability (GVOICE) in the governance model, and Political Stability and Absence of Violence (GPOLS) also in the governance model. The results substantiate the importance of the regulation and

governance for explaining the foreign ownership share of a country's banking sector.

In addition to the estimation of the six separate models, I estimate Model 7, which includes all 12 variables. From the results of this model, one finds that coefficients of some variables, such as, OSPOWER, GVOICE, GRULE, DEBYFIVE, EDIS, and GDPPCAP, become insignificant. These changes indicate that without control of some other variables, such factors do not have a significant effect on the foreign ownership share of a country's banking assets. However, coefficient of some other variables, such as MOINX, INDBANK, GPOLS, and BAGDP, are still statistically significant from zero in the comprehensive model. The F-statistic in this model is 4.22, which indicate at least one of these variables in the comprehensive model is statistically significant from zero at one percent level. These results verify the explanatory power of this comprehensive model.

Based on the empirical results, we know that the factors that affect the foreign ownership share of a country's banking assets are comprehensive. The results of the models, however, do not perfectly meet my expectations, perhaps because of missing data in the regressions. From Appendices, Table 6, one can note that the number of observations in the seven models range from 54 to 130. In Model 7, there are only 54 observations because of missing data. This, no doubt, will affect my regression results. Furthermore, except for the profitability, economic and political factors, there still are some cultural and historical factors which may have an effect on the foreign ownership share of a country's banking assets. However, there is no widely accepted

standard to quantify these factors, so they cannot be included in my models. As a result, my models answer only a limited portion of the question what determines the foreign ownership share in different countries around the world. Effort still has to be made on collecting more data from different countries all over the world and constructing indices to quantify cultural and historical factors that are not included

In general, without sufficient data and enough variables from all the countries, I cannot construct a perfect model and obtain indisputable results for foreign ownership share of a country's banking assets. However, in this thesis, I am the first one to use the new and comprehensive dataset of a market-openness index of WTO members and the regulation datasets from the bank supervision and regulation database to analyze the foreign ownership share of a country's banking assets. In this thesis, I estimate six separate models and one comprehensive model to examine the effect of market openness, regulation, governance, performance and market structure, depositor protection, and macroeconomic variables on the foreign ownership share of a country's banking assets. This is, at the very least, a start in the much needed effort for more research regarding the extent to which barriers prevent a greater degree of a country's openness in banking industries in an increasing globalized world.

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APPENDICES

Table 1

Variable Definitions and Data Sources

Variable	Code	Definition	Source	World Bank Guide Questions(WBG)
Dependent Variable				
Foreign-Owned Banks (Percent)	**FORBANK**	The extent to which a country's banking system's assets are foreign owned.	Barth, Caprio and Levine (2006)	WBG 3.8 3.8.2 What fraction of the banking system's assets is in banks that are 50 percent or more foreign owned as of the end of year 2001?
Independent Variables				
Market Openness Variable				
Market Openness Index	**MOINX**	The market openness index measures the degree of overall openness to banking entry and range of permissible activities. (The lower index value indicates greater openness or less restrictiveness.)	Barth, Marchetti, Nolle, and Sawangngoenyuang (forthcoming)	
Regulation Variables				
Overall Activities Restrictiveness	**OVER3AR**	Sum of securities, insurance, and real estate activities restrictions, that is (a)+(b)+(c). (Higher value means more restrictiveness.)	Barth, Caprio, and Levine (2006)	WBG 4.1, 4.2, 4.3 4.1 What is the level of regulatory restrictiveness for bank participation in securities activities (the ability of banks to engage in the business of securities underwriting, brokering, dealing, and all aspects of the mutual fund industry)?

Variable	Code	Definition	Source	World Bank Guide Questions(WBG)
		(a) Securities Activities: The extent to which banks may engage in underwriting, brokering, and dealing in securities, and all aspects of the mutual fund industry. (b) Insurance Activities: The extent to which banks may engage in insurance underwriting and selling. (c) Real Estate Activities, The extent to which banks may engage in real estate investment, development, and management.		Unrestricted = 1 = full range of activities can be conducted directly in the bank; Permitted = 2 = full range of activities can be conducted, but some or all must be conducted in subsidiaries; Restricted = 3 = less than full range of activities can be conducted in the bank or subsidiaries; and Prohibited = 4 = the activity cannot be conducted in either the bank or subsidiaries. 4.2 What is the level of regulatory restrictiveness for bank participation in insurance activities (the ability of banks to engage in insurance underwriting and selling)? Unrestricted = 1 = full range of activities can be conducted directly in the bank; Permitted = 2 = full range of activities can be conducted, but some or all must be conducted in subsidiaries; Restricted = 3 = less than full range of activities can be conducted in the bank or subsidiaries; and Prohibited = 4 = the activity cannot be conducted in either the bank or subsidiaries. 4.3 What is the level of regulatory restrictiveness for bank participation in real estate activities (the ability of banks to engage in real estate investment, development, and management)? Unrestricted = 1 = full range of activities can be conducted directly in the bank; Permitted = 2 = full range of activities can be conducted, but some or all must be conducted in subsidiaries. Restricted = 3 = less than full range of activities can be conducted in the bank or subsidiaries; and Prohibited = 4 = the activity cannot be conducted in either the bank or subsidiaries.

Variable	Code	Definition	Source	World Bank Guide Questions(WBG)
Official Supervisory Power	**OSPOWER**	Whether the supervisory authorities have the authority to take specific actions to prevent and correct problems.	Barth, Caprio, and Levine (2006)	WBG 5.5 + 5.6 + 5.7 + 6.1 + 10.4 + 11.2 + 11.3.1 + 11.3.2 +11.3.3 + 11.6 + 11.7 + 11.9.1 + 11.9.2 + 11.9.3 For questions 5.5,5.6,5.7, 6.1, 10.4, 11.2, 11.3.1, 11.3.2, and 11.3.3: Yes = 1; No = 0 For questions 11.6, 11.7 and 11.9: Bank supervisor=1; Deposit insurance agency=0.5; Bank restructuring or Asset Management Agency=0.5; 0 otherwise The sum of these assigned values are given, with higher values indicating greater power. 5.5 Do the supervisory agencies have the right to meet with external auditors to discuss their reports without the approval of the bank? Yes/ No 5.6 Are auditors required by law to communicate directly to the supervisory agencies any presumed involvement of bank directors or senior managers in illicit activities, fraud, or insider abuse? Yes/ No 5.7 Can supervisors take legal action against external auditors for negligence? Yes/No 6.1 Can the supervisory authority force a bank to change its internal organizational structure? Yes/No 11.2 Can the supervisory agency offer the bank's directors or management to constitute provisions to cover actual or potential losses? Yes/No 11.3 Can the supervisory agency suspend the directors' decision to distribute the following? 11.3.1 Dividends? Yes/No

Variable	Code	Definition	Source	World Bank Guide Questions(WBG)
				11.3.2 Bonuses? Yes/No
				11.3.3 Management fees? Yes/No
				11.6 Who can legally declare-such that this declaration supersedes some of the rights of shareholders-that a bank is insolvent?
				11.6.1 Bank supervisor-Yes/No
				11.6.2 Court-Yes/No
				11.6.3 Deposit insurance agency-Yes/No
				11.6.4 Bank restructuring or Asset Management Agency-Yes/ No
				11.6.5 Other-Yes/No
				11.7 According to the Banking Law, who has authority to intervene-that is, suspend some or all ownership rights-a problem bank? Bank supervisor-Yes/No
				11.7.1 Bank supervisor-Yes/No
				11.7.2 Court-Yes/No
				11.7.3 Deposit insurance agency-Yes/No
				11.7.4 Bank restructuring or Asset Management Agency-Yes/No
				11.7.5 Other-Yes/No
				11.9 Regarding bank restructuring and reorganization, can the supervisory agency or any other government agency do the following?
				11.9.1 Supersede shareholder rights?

Variable	Code	Definition	Source	World Bank Guide Questions(WBG)
				11.9.1.1 Bank supervisor-Yes/No
				11.9.1.2 Court-Yes/No
				11.9.1.3 Deposit insurance agency-Yes/No
				11.9.1.4 Bank restructuring or Asset Management Agency-Yes/No
				11.9.1.5 Other-Yes/No
				11.9.2 Remove and replace management?
				11.9.2.1 Bank supervisor-Yes/No
				11.9.2.2 Court-Yes/No
				11.9.2.3 Deposit insurance agency-Yes/No
				11.9.2.4 Bank restructuring or Asset Management Agency-Yes/ No
				11.9.2.5 Other-Yes / No
				11.9.3 Remove and replace directors?
				11.9.3.1 Bank supervisor-Yes/No
				11.9.3.2 Court-Yes/ No
				11.9.3.3 Deposit insurance agency-Yes/No
				11.9.3.4 Bank restructuring or Asset Management Agency-Yes/ No
				11.9.3.5 Other-Yes / No

Variable	Code	Definition	Source	World Bank Guide Questions(WBG)
Independence of Supervisory Authority - Banks	**INDBANK**	The degree to which the supervisory authority is protected by the legal system from the banking industry.	Barth, Caprio, and Levine (2006)	WBG 12.10 Yes=0; No=1 12.10 Are supervisors legally liable for their actions? For example, if a supervisor takes actions against a bank, can he/she be sued?
Governance Variables				
Voice and Accountability	**GVOICE**	Measures the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	http://www.worldbank.org/wbi/governance/data.html	
Political Stability and Absence of Violence	**GPOLS**	Measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism.	http://www.worldbank.org/wbi/governance/data.html	
Rule of Law	**GRULE**	Measures the extent to which agents have confidence in and abide by the rules of society, and in particular, the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence.	http://www.worldbank.org/wbi/governance/data.html	

Variable	Code	Definition	Source	World Bank Guide Questions(WBG)
Performance and Market Structure Variables				
Deposits Held by the Five Largest Banks	**DEBYFIV**		Barth, Caprio, and Levine (2006)	WBG 2.6.1 2.6.1 Given commercial banks in your country, what fraction of deposits is held by the five largest banks at the end of year 2001?
Aggregate Net Interest Margin-to-Assets Ratio	**NIMTOAR**	Aggregate Net Interest Margin-to-Assets Ratio.	Barth, Caprio. and Levine (2006)	WBG 9.6 9.6 What is the aggregate net interest margin-to-asset ratio at the end of year 2001?
Depositor Protection Variables				
Explicit Deposit Insurance Scheme	**EDIS**	Whether there is an explicit deposit insurance protection system and if not, whether depositors were fully compensated the last time a bank failed.	Barth, Caprio, and Levine (2006)	WBG 1 if 8.1=0 and/ or 8.4=0, 0: otherwise 1 Yes=0; No=1 8.1 Is there an explicit deposit insurance protection system? Yes/ No 8.4 Were depositors wholly compensated (to the extent of legal protection) the last time a bank failed? Yes/No

Variable	Code	Definition	Source	World Bank Guide Questions(WBG)
Macroeconomic Factors Variables				
GDP per capita (US$)	**RGDPP**	Real GDP per capita (US$).	Barth, Caprio, and Levine (2006)	
Bank Assets/GDP (Percent)	**BAGDP**	The ratio of the total banking assets to the total GDP of the country.	Barth, Caprio, and Levine (2006)	

Table 2

Summary Statistics of Variables

	FORBANK	MOINX	OVER3AR	OSPOWER	INDBANK	GVOICE	GPOLS
Mean	43.58	26.31	7.21	10.48	0.64	0.12	0.08
Median	36.70	23.15	7.00	11.00	1.00	0.13	0.19
Maximum	100.00	61.30	12.00	14.00	1.00	1.61	1.69
Minimum	0.00	0.00	3.00	4.00	0.00	-1.81	-2.21
Std. Dev.	34.38	12.82	2.04	3.00	0.48	0.95	0.93
Observations	131	64	151	150	149	141	141

	GRULE	DEBYFIV	NIMTOAR	EDIS	GDPPCAP	BAGDP
Mean	0.10	73.03	3.97	0.42	9016.09	285.92
Median	0.04	75.15	3.30	0.00	3614.08	69.78
Maximum	1.97	100.00	14.80	1.00	52424.49	14342.00
Minimum	-1.67	20.90	0.04	0.00	144.50	6.86
Std. Dev.	0.99	20.97	2.74	0.49	11758.21	1357.07
Observations	141	130	123	151	143	137

Table 3

Correlations Among Variables

	FORBANK	MOINX	OVER3AR	OSPOWER	INDBANK	GVOICE	GPOLS	GRULE	DEBYFIV	NIMTOAR	EDIS	GDPPCAP	BAGDP
FORBANK	1.00												
MOINX	-0.35**	1.00											
	(0.01)												
OVER3AR	-0.08	0.48**	1.00										
	(0.35)	(0.00)											
OSPOWER	0.10	-0.03	0.15	1.00									
	(0.28)	(0.80)	(0.07)										
INDBANK	0.27**	0.03	-0.23**	-0.04	1.00								
	(0.00)	(0.82)	(0.00)	(0.59)									
GVOICE	0.07	-0.29*	-0.16	-0.19*	0.03	1.00							
	(0.44)	(0.02)	(0.06)	(0.03)	(0.75)								
GPOLS	0.21*	-0.38**	-0.18*	-0.12	0.13	0.73**	1.00						
	(0.02)	(0.00)	(0.03)	(0.15)	(0.13)	(0.00)							
GRULE	-0.08	-0.29*	-0.23**	-0.11	0.07	0.81**	0.82**	1.00					
	(0.39)	(0.02)	(0.01)	(0.20)	(0.44)	(0.00)	(0.00)						
DEBYFIV	0.18	0.15	0.04	-0.23**	0.15	0.01	0.15	0.03	1.00				
	(0.05)	(0.26)	(0.66)	(0.01)	(0.20)	(0.57)	(0.78)	(0.78)					
NIMTOAR	0.10	-0.01	-0.02	-0.06	0.07	-0.36**	-0.32**	-0.48**	-0.01	1.00			
	(0.27)	(0.94)	(0.19)	(0.54)	(0.43)	(0.00)	(0.00)	(0.00)	(0.59)				
EDIS	0.27**	0.13	0.02	-0.18*	0.16	-0.10	0.12	0.00	0.27**	0.01*	1.00		
	(0.00)	(0.30)	(0.77)	(0.03)	(0.06)	(0.26)	(0.16)	(0.99)	(0.00)	(0.90)			
GDPPCAP	-0.19*	-0.28*	-0.33**	-0.05	0.04	0.58**	0.58**	0.80**	-0.26*	-0.40**	-0.11	1.00	
	(0.04)	(0.03)	(0.00)	(-0.56)	(0.65)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.18)		
BAGDP	0.21*	-0.31*	-0.04	0.07	-0.04	0.13	0.15	0.07	0.02	-0.16	-0.04	0.12	1.00
	(0.02)	(0.02)	(0.61)	(0.45)	(0.62)	(0.13)	(0.08)	(0.41)	(0.80)	(0.10)	(0.66)	(0.15)	

Note: Correlation between the variables are presented, with P-values in parentheses and **, and * represent significance at the 1 percent and 5 percent levels, respectively.

Table 4

Foreign Ownership Share of A Country's Banking Assets

(In percentage)

COUNTRY	FORBANK	COUNTRY	FORBANK
Albania*	46.0	Fiji*	98.9
Algeria	3.9	Finland*	6.2
Anguilla	38.5	Gambia	95.8
Antigua and Barbuda	58.4	Germany*	4.3
Argentina*	31.8	Ghana*	53.5
Armenia	59.0	Gibraltar	100.0
Aruba	92.3	Greece*	10.8
Australia	17.0	Grenada	88.7
Austria	19.8	Guatemala*	9.0
Azerbaijan	4.6	Guernsey	100.0
Bahrain*	72.0	Guinea*	90.0
Belarus	26.0	Guinea Bissau	100.0
Belize	94.6	Guyana*	19.0
Benin	91.0	Honduras*	18.5
Bhutan	0.0	Hungary*	88.8
Bolivia	36.3	Iceland	0.0
Bosnia and Herzegovina	73.0	India*	7.3
Botswana*	100.0	Isle of Man	98.0
Brazil*	29.9	Israel*	1.2
British Virgin Islands	98.3	Italy*	5.7
Bulgaria*	74.6	Japan	6.7
Burkina Faso	56.0	Jersey	100.0
Canada	4.8	Jordan*	64.3
Chile*	46.8	Kazakhstan	17.9
China	1.9	Kenya*	39.3
Colombia	21.5	Korea*	29.5
Commonwealth of Dominica	61.2	Kuwait	0.0
Costa Rica*	23.3	Kyrgyzstan*	24.7
Côte d'Ivoire	84.2	Latvia*	65.2
Croatia	89.3	Lesotho	100.0
Cyprus*	12.7	Liechtenstein	3.0
Czech Republic*	90.0	Lithuania*	78.2
Denmark	0.0	Luxembourg*	94.6
Ecuador*	7.0	Macau, China	87.7
Egypt*	13.3	Macedonia	51.1
El Salvador*	12.3	Madagascar	67.8
Estonia	98.9	Malaysia	19.0

Table 4 (continued)

COUNTRY	FORBANK	COUNTRY	FORBANK
Mali	67.0	Serbia & Montenegro	13.2
Malta*	60.0	Seychelles	60.2
Mauritius	24.5	Saudi Arabia*	20.7
Mexico	82.7	Slovakia*	85.5
Moldova*	36.7	Slovenia*	20.6
Montserrat	40.7	South Africa*	7.7
Morocco	20.8	Spain*	8.5
Namibia	70.0	Sudan	4.0
Netherlands*	2.2	Suriname	25.5
New Zealand*	99.1	Swaziland	85.8
Niger	73.4	Switzerland	10.7
Norway*	19.2	Taiwan, China	0.0
Oman	11.9	Tajikistan	50.0
Pakistan	20.1	Thailand	6.8
Panama*	59.3	Togo	17.5
Paraguay	83.5	Tonga	100.0
Peru*	42.5	Trinidad and Tobago*	2.4
Philippines	15.0	Tunisia*	15.7
Poland*	68.7	Turkey*	3.5
Portugal*	17.7	Turkmenistan	0.0
Puerto Rico	30.4	Ukraine	10.5
Romania*	47.3	United Arab Emirates	27.0
Russia	8.8	United Kingdom	46.0
Rwanda	0.0	United States*	19.0
Saint Kitts and Nevis	46.0	Uruguay*	43.3
Saint Lucia	58.0	Vanuatu	94.1
Saint Vincent and The Grenadines	65.0	Venezuela*	43.2
Samoa	87.0	Zimbabwe	28.02
Senegal	78.7		

Note:

The countries with * are included in the regression on foreign ownership share of a country's banking assets with 54 observations.

Table 5

Variance Inflation Factor (VIF) Test Results

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
MOINX (Market openness Index)	1.000						1.951
OVER3AR (Overall Activities Restrictiveness)		1.093					1.610
OSPOWER (Official Supervisory Power)		1. 037					1.392
INDBANK (Independent of Supervisory Authority—Bank)		1.065					1.349
GVOICE (Voice and Accountability)			2.917				3.542
GPOLS (Political Stability and Absence of Violence)			3.018				4.735
GRULE (Rule of Law)			3.873				6.408
DEBYFIV (Deposit held by the Five Largest Banks)				1.002			1.425
NIMTOAS (Net Interest Margin-to-Assets Ratio)				1.002			1.623
EDIS (Explicit Deposit Insurance Scheme)					1.000		1.397
GDPPCAP (GDP per Capita)						1.017	4.154
BAGDP (Bank Assets to GDP)						1.017	1.926

Note:

The Variance Inflation Factor (VIF) is a method of detecting the severity of multicollinearity. A common rule of thumb is that if VIF is greater than or equal to 10, multicollinearity is severe enough that corrective action of some type should be taken.

Table 6

Foreign Ownership Share of Banking Assets Regression Results

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
INTERCEPT	66.29*** (-2.92)	19.36 (1.26)	40.22*** (14.76)	10.20 (0.82)	35.14*** (9.17)	46.15*** (12.65)	26.48 (1.06)
MOINX (Market openness Index)	-0.91*** (-2.92)						-0.93*** (-2.49)
OVER3AR (Overall Activities Restrictiveness)		-0.56 (-0.36)					-0.67 (-0.31)
OSPOWER (Official Supervisory Power)		1.48* (1.50)					1.62 (1.16)
INDBANK (Independent of Supervisory Authority—Bank)		20.69*** (3.37)					11.69* (1.50)
GVOICE (Voice and Accountability)			6.83* (1.37)				-4.56 (-0.60)
GPOLS (Political Stability and Absence of Violence)			25.76*** (5.04)				16.76* (1.98)
GRULE (Rule of Law)			-28.15*** (-5.03)				-7.57 (-0.81)
DEBYFIV (Deposit held by the Five Largest Banks)				0.37*** (2.47)			0.21 (1.04)
NIMTOAS (Net Interest Margin-to-Assets Ratio)				0.55 (0.49)			0.731 (0.57)
EDIS (Explicit Deposit Insurance Scheme)					18.13*** (3.12)		6.42 (0.73)
GDPPCAP (GDP per Capita)						-0.01*** (-2.51)	-0.01 (-1.18)
BAGDP (Bank Assets to GDP)						0.01*** (2.72)	0.02* (1.55)
Observations	63	127	121	102	130	123	54
***R*-square**	0.12	0.10	0.22	0.06	0.07	0.09	0.55
$\overline{R}$ **-square**	0.11	0.08	0.20	0.04	0.06	0.08	0.42
F-statistic	8.51***	4.68***	11.28 ***	2.12	7.53***	6.10***	4.22***

Note: Coefficients from OLS estimations are presented, with t-statistics in parentheses and ***, **, and *, representing significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table 7

Foreign Ownership Share of Banking Assets Regression Results
(54 observations)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
INTERCEPT	71.53*** (8.09)	16.38 (0.78)	43.86*** (9.95)	21.99 (1.24)	35.80*** (7.34)	43.73*** (8.22)	26.48 (1.06)
MOINX (Market openness Index)	-1.24*** (-3.99)						-0.93*** (-2.49)
OVER3AR (Overall Activities Restrictiveness)		-3.35* (-1.62)					-0.67 (-0.31)
OSPOWER (Official Supervisory Power)		3.52*** (2.42)					1.62 (1.16)
INDBANK (Independent of Supervisory Authority—Bank)		15.21** (1.83)					11.69* (1.50)
GVOICE (Voice and Accountability)			-12.88* (-1.72)				-4.56 (-0.60)
GPOLS (Political Stability and Absence of Violence)			36.86*** (4.76)				16.76* (1.98)
GRULE (Rule of Law)			-16.33** (-2.23)				-7.57 (-0.81)
DEBYFIV (Deposit held by the Five Largest Banks)				0.24 (1.07)			0.21 (1.04)
NIMTOAS (Net Interest Margin-to-Assets Ratio)				0.21 (0.15)			0.731 (0.57)
EDIS (Explicit Deposit Insurance Scheme)					15.02* (1.55)		6.42 (0.73)
GDPPCAP (GDP per Capita)						0.001** (-2.17)	-0.01 (-1.18)
BAGDP (Bank Assets to GDP)						0.03*** (2.62)	0.02* (1.55)
Observations	54	54	54	54	54	54	54
***R*-square**	0.23	0.22	0.31	0.02	0.04	0.13	0.55
$\overline{R}$ **-square**	0.22	0.18	0.27	0.02	0.03	0.09	0.42
F-statistic	15.92***	4.87***	7.66***	0.57	2.42*	3.78**	4.22***

Note: Coefficients from OLS estimations are presented, with t-statistics in parentheses and ***, **, and *, representing significance at the 1 percent, 5 percent, and 10 percent levels, respectively.