The Determinants of the Exit Decisions of Foreign Banks

Aneta Hryckiewicz [a, b], Oskar Kowalewski [c]

[a] Goethe University Frankfurt, Germany
[b] Kozminski University, Poland
[c] Warsaw School of Economics, Poland

This paper examines the determinants influencing multinational banks' decisions to exit a foreign market in the years 1999-2006. Using binary response models, we find that parent banks that closed a foreign operation reported significant financial weakness prior to the exit decision. We also show that the decisions of the parent banks were not caused primarily by the performance of the foreign banks' subsidiaries. Consequently, we document that the exit decisions were a result of financial problems of the parent banks in their home markets. This finding supports the need for global bank supervision, showing that it is important to monitor both the parent bank and its foreign subsidiary. The results also provide evidence that the recent financial crisis may change the ownership structure and the level of foreign ownership in the banking systems in many countries around the world.

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1. Introduction

The rapid development of multinational banking has resulted in banks' owning and controlling activities in different geographical locations. Consequently, in a number of countries today, foreign banks own as much as 90% of the total assets of the national banking system, especially in emerging markets in Latin America, East Asia or Central and Eastern European transition countries. As a result, the determinants and motivations of multinational banks' expansions abroad have been intensively studied in the finance literature for the last two decades[1].

Whereas the spotlight has been focused principally on foreign entry, the sell-off of foreign-owned assets has quietly become an important phenomenon in the banking industry. In fact, the recent financial crisis and the prominence of divestiture represent what are likely to be the most visible signs of multinational banks' restructuring and asset reallocation across countries. Currently, in the existing literature on multinational banking, there are no empirical studies regarding the determinants of foreign banks' exit decisions. This is surprising given the important role that foreign banks play in the development of the financial system and cross-country diversifications in the asset portfolios of many large banks. Therefore, we currently do not know what determines the selling off or closing of foreign operating assets by multinational banks, even though this practice has been widespread in the industry for a long time.

Understanding the determinants of foreign banks' exit decisions seems to be especially relevant in light of the recent financial crisis. History suggests that during a crisis, foreign banks can ringfence local subsidiaries and decline to recapitalize them, which is what occurred in Argentina in 2001. This strategy helps parent banks minimize risk and reduce loss in the value of the capital in, and any loans they have made to, their subsidiary, although they cannot do the same for their entire balance sheet. However, the likelihood that a parent bank will let its foreign subsidiaries fail is considered remote in the literature as a default would cause reputational damage to the parent bank (Makler and Ness, 2002), which can lead to a real threat of deposit flight away from other foreign-owned subsidiaries. Therefore, until the crisis, parent banks were always seen as available, steady sources of funding and capital for their subsidiaries abroad. Nevertheless, the recent financial crisis affected the

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[1] A comprehensive survey of the theoretical literature and empirical research is provided by Williams (1997).

parent banks to such an extent that some had to resort to public support in their home countries. Consequently, many parent banks are now forced to deleverage, which may induce them to exit foreign markets as part of their restructuring. In addition, this process can require parent banks to limit balance sheet growth at their foreign subsidiaries and thereby dampen the chances of economic recovery in the host country. In this respect, the relationship between parents and their foreign bank subsidiaries and the merits of foreign ownership in domestic banking systems may have to be reassessed because foreign ownership may also destabilize the banking industry and act as a constraint to growth for host countries. However, we do not know whether the financial situation of the parent bank can affect the foreign-owned subsidiary and eventually force it to exit the host market.

Accordingly, in this paper, we developed two hypotheses related to the performance of multinational banks and their subsidiaries, which may determine the decision of the parent bank to exit a foreign market. To test these hypotheses, we employ binary dependent variable models and find that foreign-owned subsidiaries are divested as a result of their parent bank's underperformance in its home country. The results are reinforced by the fact that we find no evidence that the divested foreign-owned subsidiaries had lower profitability or encountered any financial problems prior to the exit decision of the parent bank. At the same time, the results show that the parent bank had negative results prior to the subsidiary's closing. Therefore, we document that the exit decision is associated with a decline in the financial performance of the parent bank in the home country rather than with problems with the foreign-owned subsidiaries.

This paper contributes to the existing literature in the following ways. Most importantly, we address a neglected topic in the literature and one that has important consequences for understanding the cross-border activity of multinational banks. Second, employing a different approach and methodology from those used in previous studies, which are either theoretical (Leung et al., 2008) or based on case studies (Tschoegl, 2005), we support previous findings on the causes of foreign banks' exit decisions. Third, by showing how the performance of a parent bank influences its international activity, this study contributes to the literature on the relationship between a parent bank and its foreign operations. This includes studies that find evidence of multinational banks' transmitting their home country's financial shocks (Peek and Rosengren, 1997). Finally, we provide evidence of the effects of foreign ownership on domestic banks, which may aid in the discussion of policies regarding a foreign bank's entry and supervision in the future.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature on withdrawal decisions of foreign banks in general and presents our main hypotheses. Section 3 describes the data regarding foreign subsidiaries and parent banks and presents the variables employed in the analysis. Section 4 discusses the methodology used in the regressions. Section 5 summarizes the empirical results, and Section 6 concludes.

2. Motivation for the Exit Decision

In the last few decades, many countries, particularly those with developing economies, have embraced financial globalization and welcomed foreign banks into their banking sectors. In developing countries, this has largely been led by the privatization of state-owned banks and the rescue of distressed domestic financial institutions. As a result, Claessens et al. (2008) reported that the percentage of domestic banks among all banks in the developing world declined from 77% in 1995 to 62% in 2006, whereas the share of foreign banks increased from 23% in 1995 to 38% in 2006. Today, in approximately 45% of all developing countries, more than 50% of banks have foreign owners. Strikingly, this figure exceeds 80% in several emerging markets, especially in Latin American and Central and Eastern European countries.

The existing literature shows that local market opportunities are a major factor in attracting foreign banks into new markets (Dunning, 1977). Dopico and Wilcox (2002) note that foreign banks are more pervasive in countries where banking is more profitable and where the banking sector is smaller relative to GDP. Demirgüç-Kunt and Huizinga (1999) and Claessens et al. (2001) find that

foreign banks tend to have higher margins and profits than do domestic banks in developing countries but that the opposite holds in industrialized nations. This may also explain why foreign banks have been especially attracted to developing countries in the last two decades.

By entering a new local market, foreign banks alter the environment. The impact of foreign banks' entry on host countries' banking systems is that they undermine the local conditions that attracted these foreign banks in the first place. In a cross-country study, Claessens et al. (2001) show that foreign-owned banks make domestic markets more competitive. Their presence was associated with reduced profitability and diminished overhead for domestic banks, and this mapped onto improved bank-sector efficiency. Increased domestic bank efficiency and intensified competition after foreign bank entry are also evidenced in country-specific studies. Clarke et al. (1999) show that the increased foreign competition in loan markets in Argentina has led to reduced margins and profits. In addition, Unite and Sullivan (2003) document that in the Philippines, foreign competition has forced domestic banks to be more efficient and to become less dependent on relationship-based banking practices. As a result, this foreign penetration has caused domestic banks' interest spreads to narrow and profitability to decline as new competitors reduce the market prices of funds in an attempt to build market share.

As the evolution of the host markets slowly erodes comparative advantage, the profitability of a foreign-owned bank subsidiary may decline. The decline in profitability can motivate the parent bank to exit the foreign market. Indeed, in 2003, the Spanish Banco Bilbao Vizcaya Argentaria (BBVA) sold its Brazilian operations to Bradesco. BBVA had bought Banco Excel-Economico in 1998 and eventually sold it after realizing that it would be too expensive to achieve an optimal, profitable asset size (Tschoegl, 2005).

Lensink and Hermes (2004), however, report that foreign entry is associated with shrinking margins in developing countries but not necessarily in developed countries. The results of this study may also explain why foreign bank subsidiaries are more often closed by parent banks in developing countries but are quite seldom shuttered in industrialized countries.

To restate, the divestment of a foreign bank subsidiary can either be connected to a decrease in market opportunities in the host country or to poor performance. However, a change in the parent company's strategy or legal requirements in either the home or the host market may also explain the divestment of a foreign bank subsidiary. Tschoegl (2004) reports that the British Lloyds Bank decided to withdraw from California when Brian Pitman took over as CEO in 1983 and started to divest international assets and refocus on the domestic retail market. In addition, at this time, other British banks were also departing from California to focus on their operations at home. According to Tschoegl (2004), between 1986 and 1988, the British Midland Bank, Lloyds Bank and Barclays Bank sold their operations after reporting performance that ranged from weak to disastrous. Nevertheless, the strategic change toward focusing on domestic markets and divestment of foreign assets should be related to the poor performance of foreign operations in the past. Otherwise, the parent bank would not decide to divest them as to do so would have a negative impact on the overall profitability of the multinational bank.

Moreover, Tschoegl (2005) argues that parent banks may sell a subsidiary when the host country markets are depressed and the foreign owners see little benefit in staying abroad. Therefore, it can be assumed that foreign banks tend to depart quickly from any host markets that face political, economic or financial crises, as was the case in Asia in 1997 or Latin America in 1999. This is because crises often result in the erosion of the economic potential of the host country, potentially causing foreign-owned banks to suffer during a general downturn. On the other hand, studies on economic and financial crises suggest that foreign banks tend not to be as heavily impacted by crises as domestic banks are, in part because they are often more conservative in their lending (Crystal et al., 2001). In addition, Dages et al. (2000) conclude from their study of foreign banks in Argentina and Mexico during 1994-99 that foreign banks exhibited stronger and less volatile loan growth than did domestic banks.

Conversely, foreign banks may even try to increase their penetration in host-country markets during economic or financial crises at the expense of domestic banks. Hence, crises may correlate positively with an expanded role for foreign banks. Foreign banks, which are less tied to the domestic economy, can expand their activities, whereas domestic banks have to react to the crisis by curtailing their lending. Furthermore, crises may remove regulatory barriers to the acquisition of local banks by foreign banks. However, Engwall et al. (2001), who have studied foreign banks' behavior in the Scandinavian countries after the deregulation of their domestic banking markets and the subsequent entry of foreign banks, fail to find any evidence that the financial crisis in the region led to an increased role of foreign banks in the domestic banking systems.

Running counter to the findings of Crystal et al. (2001) and Dages et al. (2000) are the cases of foreign subsidiaries in Argentina, where the parent banks were unwilling to recapitalize failed subsidiaries after the financial crisis, instead turning them over to the Argentine government for rescue. First, in 2001, concerns about the liquidity of Scotiabank Quilmes, a subsidiary of the Canadian Scotiabank, led Argentina's central bank to suspend its operations. At the same time, the parent bank refused to recapitalize the subsidiary and instead abandoned it. As a consequence, the subsidiary was sold to domestic-owned Banco Comafi and Banco Bansud. One year later the French Crédit Agricole also refused to increase its capital in its Argentinean operations and instead chose to abandon its three subsidiaries. This time, the subsidiaries were taken over by the state-owned Banco de la Nación Argentina, which has since kept them running (Tschoegl, 2005). According to Calomiris et al. (2005), the problem in Argentina has been the asymmetrical pesification, which has acted as a tax on bank capital and transfers for depositors, leading to financial problems for the foreign subsidiaries followed by a decision by the parent bank to pull out. Nevertheless, these examples show that foreign bank subsidiaries can be shuttered if financial problems intensify in the host country. As a result, and based on the empirical studies reviewed above, our first hypothesis proposes the following:

Hypothesis 1: A parent bank decides to exit a host country due to the low profitability of the foreign-owned subsidiary.

In Argentina, several foreign bank subsidiaries reported problems but were not supported by their parent banks. This case shows that foreign-owned subsidiaries are not completely autonomous organizations but rather comprise part of a multinational bank with an internationally diversified asset portfolio. As a result, their policies are influenced by the decisions of the parent bank. On the positive side, this parent bank may act as a lender of last resort during crisis periods or may manage an internal capital market and centralized treasury operations to allocate capital and liquidity among its subsidiaries (Stein, 1997). This may then translate into a more stable financial situation for the foreign-owned subsidiary. More specifically, a supportive parent bank and abundant funding sources may make foreign-owned banks less prone to the adverse effects of a capital shock to the host-country bank. Therefore, the foreign-owned banks may be able to recover relatively quickly and continue operating more effectively than domestic banks. This may also explain why a large number of previous studies have reported positive results for foreign-owned banks during a financial crisis in the host country. The downside of this fact is that the foreign-owned subsidiary may be less affected than local banks by problems in the host country's economy but more affected by the problems of the parent bank in the home country. Therefore, one may argue that foreign banks' operations are less stable than those of domestic banks. This may be the case if foreign banks react more procyclically to changes in their host country's macroeconomic environment. Indeed, de Haas and van Lelyveld (2010) show that parent banks reallocate capital over different geographical regions on the basis of expected risks and returns on investment. According to their study, when the economic growth in a particular host country declines, the activities of the subsidiaries in the country may be scaled down in favor of other regions. Given this line of reasoning, the parent banks may decide to divest their foreign assets in the face of domestic problems.

Peek and Rosengren (2000) investigate how the financial crisis in Japan in the early 1990s affected lending by Japanese banks in the United States. They show that the position of Japanese

banks in the US banking sector declined after the financial crisis in the 1990s. Similar results are presented by Tschoegl (2004), who demonstrates that the assets of Japanese bank subsidiaries in California peaked in the early 1990s and subsequently fell. In addition, many Japanese banks decided to leave California as Japan's economic problems intensified. Of the eight subsidiaries that Japanese banks established in California between 1952 and 1978, only three are still in existence today, the rest having disappeared through mergers with survivors or through acquisitions. The history of Japanese banks in California shows that those parent banks that sold their subsidiaries did so more as a result of problems in Japan than because of problems with their foreign operations. The parent banks sold their foreign operations to reduce costs and raise capital as the problems in their home economy intensified due to the collapse of the stock market and land price bubbles. As the Japanese economy stagnated, the parent banks, beset by domestic problem loans, reevaluated their international investments (Tschoegl, 2004).

The recent history of Banca Intesa, however, shows that when the home country's problems can be overcome, foreign operations may be rebuilt. In Europe, Banca Intesa, one of Italy's largest banks, disposed of most of its foreign operations during 2001-2004. The divestment was caused by declining profitability and the growing problems of bad loans and higher overhead costs. As a result, the new CEO, Corrado Passera, who took over Banca Intesa in 2002, decided to refocus its operations on the domestic market and to sell its foreign subsidiaries in Europe, South America and North America. Banca Intesa's profit improved significantly, and its return on equity increased to 12.9%, up from 1.4% in 2002. The positive results led to a change in strategy. In 2004, Intesa again began seeking growth opportunities abroad by acquiring or opening new foreign subsidiaries.

The closing or sale of foreign subsidiaries can also be a result of the collapse of the parent bank. In 1982 Banco Ambrosiano, an Italian bank, collapsed. When the bank collapsed, the Italian authorities protected Italian depositors by transferring the bank's business to a new entity. However, they disclaimed responsibility for the obligations of Ambrosiano's Luxembourgian and Latin American subsidiaries. On the contrary, when Demirbank failed in Turkey in 2000, its subsidiary in Bulgaria continued to function, and there was no run on the foreign bank subsidiary. Instead, the foreign subsidiary was simply an asset that the Turkish authorities sold in the process of liquidating the failed parent bank (Tschoegl, 2005). Based on these studies on the behavior of foreign parent banks, we put forward our second hypothesis as follows:

Hypothesis 2: The decision to exit a foreign market is determined by the financial underperformance of the parent bank in the home market.

3. Data and Summary Statistics

We assembled an original database of the exit decisions of parent banks from foreign markets from 1999-2006. In the study, we define a parent bank exit from a host country as a parent bank's closing or selling its subsidiary to either a domestic or foreign investor. We consider the term foreign bank subsidiaries to mean locally incorporated banks with over 50% foreign ownership. To be included as a subsidiary in the final sample, foreign banks had to have financial data in BankScope for the period of withdrawal and needed to be classified as commercial banks. We excluded bank branches, savings banks and agencies of foreign banking organizations to avoid inconsistencies in the formats of financial statements among different types of banks and across multiple countries.

Based on these criteria, we identified 81 foreign bank withdrawals in different countries during the period 1999-2006. In the empirical analysis, the loss of observations from the original sample was the result of missing financial data in BankScope. As a result, the final sample was reduced to 48 cases where we were able to retrieve the unconsolidated financial statements for the three years prior to the exit decision of the parent bank.

Table 1 lists the identified closures of foreign bank subsidiaries by host country. It illustrates that the greatest number of closures were in Latin American and Central Europe. This is not surprising as these two regions also reported the largest amount of foreign bank operations in the last two decades (Cerutti et al., 2007).

Table 1
Number of foreign bank subsidiary closures by host country

Country	1999	2000	2001	2002	2003	2004	2005	2006	Total
Algeria								1	1
Argentina			2	4		2	1		9
Aruba			1						1
Austria	1						1		2
Bahrain			1						1
Bolivia		1						1	2
Brazil					2	1			3
Chile			1		1				2
Colombia					1				1
Croatia				1		1		1	3
Cyprus						1			1
Czech Republic				1		2		1	4
Denmark							1		1
Ecuador			1						1
Egypt			2						2
Hungary			1	1			1		3
Indonesia			2	1	3	1			7
Kenya			1						1
Lebanon				2					2
Mexico					1				1
Morocco			1		2				3
Nepal				1					1
Netherlands			1						1
Panama	1		2					1	4
Paraguay	1				2				3
Peru			1						1
Philippines		1		1					2
Poland					1	2		1	4
Portugal		1							1
Paraguay						1			1
Romania			3				1	1	5
Slovakia						1			1
Sri Lanka			2						2
Suriname		1							1
Ukraine								1	1
Uruguay					1				1
Venezuela			1						1
Total	3	4	23	12	14	12	5	8	81

Argentina and Indonesia feature the most foreign bank subsidiary closures. From 1999-2006, nine foreign bank subsidiaries were closed in Argentina, seven in Indonesia and five in Romania. Note that approximately half of the closures in Latin America and Asia in the eight-year sample period occurred during 2001-2002. The large number of closures in this period may be associated with the financial crises in emerging markets that started in Asia in 1997, spilling over in the following year into Russia and two years later into Brazil. Shortly thereafter, the financial crisis enveloped the Latin American continent. Simultaneously, in 2001, most industrialized countries went into a mild recession caused by the crash of the Internet bubble and the bankruptcy of Internet and technology companies. As a consequence, the profitability of the parent banks shrank, which may have prompted the decision to divest assets abroad.

Based on the sample and including closed foreign bank subsidiaries, we constructed a second dataset to examine the origins of the parent banks. It was used to test whether the parent banks'

problems may have led to closures of their foreign operations. In this dataset, we counted the parent bank only once regardless of how many subsidiaries were sold or closed in a given year. For example, the Dutch ABN Amro was counted only three times between 2000 and 2002, even though the number of subsidiaries closed by the bank was substantially greater than three. During this period, the bank's strategy was to allocate its resources to those markets that generated the highest possible profits for its clients and shareholders and to exit those markets that failed to fit that framework. As a result, ABN Amro sold its foreign operations in countries such as Aruba, Bahrain, Bolivia, Ecuador, Kenya, Morocco, Lebanon, Panama, Sri Lanka and Suriname from 2000-2002. However, we counted ABN Amro only once per year in the sample as we were interested only in registering that the parent bank was shuttering its foreign operations, not in the number of closed subsidiaries.

We also listed the parent bank even if the closure of a subsidiary was actually implemented by another foreign subsidiary that was owned by the parent bank. Since 2001, the Italian Banca Intesa has closed several of its operations in South and North America. These foreign operations were controlled by Banque Sudameris, a subsidiary of Banca Intesa, which is located in France. Nevertheless, we counted the sale of Banque Sudameris' operations abroad as divestments of Banca Intensa.

Table 2 shows the number of identified parent banks that decided to exit foreign markets in the years 1999-2006. Most of the foreign-owned subsidiaries were liquidated by their parent banks through a sale to a domestic or foreign investor. The majority of those transactions were conducted by parent banks mostly from industrialized countries, especially Western European countries.

Table 2
Parent banks that closed foreign subsidiaries

Country	1999	2000	2001	2002	2003	2004	2005	2006	Total
Australia						1			1
Austria								2	2
Brazil	1								1
Canada			1	1					2
Czech Republic						1			1
Ecuador			1						1
Egypt								1	1
France		1		2	1	1		1	6
Germany				2	2	3		1	8
Honduras			1						1
Hong Kong		1							1
Italy				1	1	1	1		4
Japan		2		1					3
Korea				2			1		3
Lebanon								1	1
Mexico				1					1
Netherlands		1	1	1					3
Norway							1		1
Russia							1		1
Spain					2			2	4
Turkey	1		3						4
UK			1		1	2			4
USA	1				1			1	3
Total	3	3	10	10	9	9	4	9	57

Eight disposal decisions were made by German parent banks, and six were made by French parent banks. This is not surprising because in the last two decades, the majority of foreign direct

investments in developing countries came from multinational banks headquartered in developed countries (Horen van, 2007).

The results of the study can nevertheless be applied very generally to the development and character of multinational banking, as the current financial crisis indicates. In the last few months, many financial institutions have announced decisions to sell off their international operations. For example, at the end of 2008, the US-based Citigroup decided to sell its German subsidiary to the French Crédit Mutuel. Two years later, the Swedish SEB also decided to sell its operations in Germany, which were bought by the Italian UniCredito Italiano. In the same period, AIG's foreign banking operations in Poland were bought by the Spanish Banco Santander. Therefore, the recent transaction history confirms that the likelihood of exiting a foreign market is similar for industrialized and developing countries.

3.1 Choice of Variables

In this study, the empirical model was loosely based on the literature regarding bank failures and acquisitions. Following the work of Martin (1977) on bank failures and keeping in mind that our sample is pooled across several countries, eight variables were selected that cover most aspects of bank performance. Those variables serve as proxies for the basic motives behind divestment decisions and measure capital strength, asset quality, liquidity, profitability and efficiency. These five ratios originate from the CAMEL system used by US regulators to identify at-risk banks. The remaining three variables cover additional financial characteristics, such as size, asset growth and loan activity and are often considered in the literature on bank acquisition (Wheelock and Wilson, 2004). Table 3 presents a list of the variables used in the regression along with the bank characteristics that they measure, which are fairly standard measures of bank condition that regulators, investors, and other interested parties normally monitor over time for performance evaluations.

Table 3
Definitions of variables used to explain the closure of subsidiaries

Variable	Definition	Category
Assets	Log total assets	Size
AGrowth	Annual change in total assets	Asset Growth
Equity	Equity to total assets ratio	Capital strength
Loans	Net loans to total assets ratio	Loan activity
Liquidity	Liquid assets to customer and short-term funding ratio	Liquidity
LQuality	Loan loss provision to net interest revenue ratio	Loan Quality
ROAA	Return on average assets ratio	Profitability
Costs	Cost to income ratio	Efficiency in expenses

Consistent with previous studies, we use the logarithm of total assets as a measure of size (*Size*) in the regressions. This may have an impact on the likelihood of closure for numerous reasons. First, large subsidiaries may be less likely to be closed by the parent bank as they should be more profitable due to scale. Second, large subsidiaries should have a greater impact on the profitability of the parent bank. In contrast, in the case of a large subsidiary running into difficulties, these could significantly impact the parent bank's performance. Furthermore, large parent banks are more likely to have a wide international network, which can be divested to increase capital availability. Therefore, it is difficult to determine a priori what will be the impact of size on the likelihood of closing a foreign bank's subsidiary.

As for asset growth, Kocagil et al. (2002) point out that some banks whose asset growth rates are relatively high may experience problems because their management or structure are unable to deal with and sustain exceptional growth. They support these conclusions with empirical data. With high asset growth, the likelihood of financial problems increases. In line with the results of this study, we represent the influence of bank growth by the annual change of the bank's total assets (*AGrowth*).

Wheelock and Wilson (2000) suggest that a bank with a lower capitalization will face a greater probability of disappearing. They argue that this is true both in the case of the acquisition of failing banks prior to insolvency and with the purchase of banks by skillful managers who are able to operate successfully with high leverage. In this previous study, capital strength is represented by the equity-to-assets ratio (*Equity*), which measures the amount of protection offered to the bank by its equity.

Net loans divided by total assets indicates the percentage of bank assets that are tied up in loans (*Loans*). Hannan and Rhoades (1987) suggest that, on the one hand, a high loan rate would seem to indicate aggressive behavior by the bank, whereas on the other hand, a low loan rate may indicate a bank that has a conservative or complacent management team.

Another important aspect that can influence the likelihood of closing is a bank's liquidity position. We assume that banks that are particularly illiquid may find it difficult to avoid closing or may be willing to be acquired as they have developed liquidity problems that are difficult to overcome. In the regression, we consider the ratio of liquid assets to customers and short-term funding (*Liquidity*), which measures the percentage of the latter that can be met almost on demand.

Bank weakness and closing can be attributed to poor management, as manifested in excessive credit and worsening loan quality. As a measure of loan quality in the regression, we use the ratio of loan-loss provisions to net interest revenue (*LQuality*). An increase in this ratio represents poor loan quality, which should increase the odds of closing.

Finally, bank problems and closures of foreign subsidiaries may be caused by bad management. Poorly managed banks are more likely to be closed or acquired by those who think they can manage them more efficiently. In the study, we consider two measures of managerial performance, one of which represents profitability and the other cost efficiency. The profitability measure is return on average assets (*ROA*), calculated as net profit divided by average total assets. An increase in this ratio should lower the odds of closing a foreign-owned subsidiary. As a measure of expense management efficiency, we use the cost to income ratio, which measures the proportion of income to expenditures (*Costs*).

3.2 Bank Control Sample

In the literature on bank failure and acquisition, there is no single method of choosing the control sample. Following the study by Platt and Platt (1990) on bankruptcy prediction, we applied industry-relative ratios to the data sample to calculate industry-specific differences. Therefore, we matched the control sample with a group of peer domestic banks from the host and home countries in terms of assets based on the financial statement for the year in which a foreign subsidiary closed. In cases of closed subsidiaries, we additionally used a peer group sample of other foreign subsidiaries owned by the same parent bank that were not closed during the period of interest. This peer sample of bank subsidiaries allows us to control for parent-specific operations, but we elected not to control for country-specific characteristics.

We note mixed results regarding whether matched data are better than random data. Cudd and Duggal (2000) present data that depend strongly on the distributional characteristics and on the definition of a dummy industry disturbance variable. Asterbo and Winter (2001) report that models with industry-adjusted variables perform worse than those with non-adjusted variables. Barnes (2000) reports that raw accounting ratios and industry-relative ratios based on the same underlying data generate significantly different forecasts using the same statistical techniques. We thus decided to use both industry-matched control samples and control samples with random banks to investigate the determinants of the exit decisions of parent banks from foreign markets.

3.3 Descriptive Statistics

3.3.1 Closed Foreign Bank Subsidiaries in the Host Country

The sample of foreign-owned banks in terms of closure probabilities consisted of 48 subsidiaries that were closed in the host country in the years 1999-2006. The closed foreign banks were matched

with a control sample of local banks with similar asset sizes and characteristics. We later expanded the control sample by randomly adding one or two domestic banks depending on the availability of data for the country and period.

In the asset-matched control sample as well the random sample, the domestic banks were commercial banks still operating in the host country. These included foreign bank subsidiaries and privately- and state-owned domestic banks. In both control samples, the matching criteria used were time and country so that direct comparisons between closed foreign banks and operational domestic banks could be made without a need to adjust for time and country effects.

Table 4 lists the independent variables and their mean values for the sample of closures and the two control samples of domestic banks for the year of closure and for one year prior to that event. The univariate statistics suggest that closed foreign subsidiaries are more profitable than local commercial banks on average. The higher profitability may be attributed to the lower costs of nonperforming loans. The foreign subsidiaries also have lower proportions of loans and higher levels of liquidity on average. Higher liquidity and equity ratios of foreign subsidiaries suggest a lower likelihood of financial distress. Moreover, the asset growth of foreign subsidiaries is on average lower than that of local banks. However, foreign subsidiaries report a lower cost-to-income ratio than local banks only in the year prior to closing. In contrast, the increase in the cost-to-income ratio in the year of the subsidiaries' closure may be attributed to one-time charges caused by the divestment of the subsidiary by the parent bank.

Table 4
Summary statistics describing characteristics of the closed foreign bank subsidiaries and control sample one year prior to and during the year of closure

	Subsidiary		Matched			Random		
Variable	Mean	Std.Dev.	Mean	Std.Dev.	t-test	Mean	Std.Dev.	t-test
$Assets_{t0}$	5.369	1.540	5.338	1.600	-0.091	5.243	1.744	0.511
$AGrowth_{t0}$	-0.000	0.005	0.002	0.005	1.491	0.001	0.004	1.950**
$Equity_{t0}$	0.225	0.325	0.168	0.131	-1.098	0.167	0.161	-1.489
$Loans_{t0}$	0.427	0.204	0.438	0.197	0.304	0.442	0.191	0.388
$Liquidity_{t0}$	0.532	0.796	0.344	0.247	-1.360	0.524	0.797	-1.750*
$LQuality_{t0}$	0.388	0.135	0.277	0.118	-0.619	0.285	0.709	-0.709
$ROAA_{t0}$	-0.010	0.108	-0.013	0.106	-0.152	-0.003	0.066	0.540
$Costs_{t0}$	0.864	0.654	0.791	0.358	-0.610	0.855	0.730	0.510
$Assets_{t-1}$	5.516	1.512	5.326	1.599	-0.602	5.230	1.698	-0.173
$AGrowth_{t-1}$	0.000	0.005	0.002	0.005	1.404	0.001	0.003	1.189
$Equity_{t-1}$	0.185	0.194	0.172	0.118	-0.412	0.175	0.177	-0.308
$Loans_{t-1}$	0.448	0.203	0.461	0.197	0.304	0.455	0.199	0.079
$Liquidity_{t-1}$	0.342	0.242	0.339	0.223	-0.040	0.361	0.258	0.510
$LQuality_{t-1}$	0.221	0.487	0.583	1.152	1.896*	0.387	0.798	1.337
$ROAA_{t-1}$	0.000	0.058	-0.004	0.047	-0.455	-0.001	0.046	0.035
$Costs_{t-1}$	0.771	0.316	0.830	0.640	0.556	0.829	0.833	1.123

Notes: Means and standard deviations of financial variables for divested foreign-owned subsidiaries and the asset-matched and random control samples. The statistical significance of each mean difference is based on a two-tailed paired samples t-test under the null hypothesis of a mean difference of zero. *, **, and *** indicate a significant difference between closed foreign bank subsidiaries' and domestic banks' mean values at the 10%, 5% and 1% levels, respectively.

Overall, the results of the univariate analyses do not present any significant differences between closed foreign subsidiaries and still-operational domestic banks, which may explain the motivation for a parent bank's closing a subsidiary. In contrast, we report higher profitability, equity ratios and liquidity of the foreign-owned subsidiaries than of local banks, which speaks against significant financial distress. Consequently, the results imply that the parent bank's problems are more likely to be the main reason for closing a subsidiary.

3.3.2 Parent Banks and Domestic Banks in the Home Country

As shown in Table 5, the mean values of the independent variables for the parent banks are significantly different from those of local banks in the home country in a number of cases. Denoted in the table by asterisks, the profitability variable has significant t-statistics for mean differences between parent banks and asset-matched local banks, as well as the randomly chosen banks in the control sample. The control sample contains randomly chosen commercial banks from the home country, which are also on average larger in terms of asset size and report asset growth than the parent banks.

Table 5
Summary statistics for the parent banks and the two control samples of domestic banks in the year of closure of a foreign subsidiary and one year prior

	Subsidiary		Matched			Random		
Variable	Mean	Std.Dev.	Mean	Std.Dev.	t-test	Mean	Std.Dev.	t-test.
Assets_{t0}	11.690	2.006	11.460	1.543	-0.612	10.810	2.103	-2.629***
AGrowth_{t0}	0.002	0.003	0.002	0.002	-0.307	0.002	0.003	-0.681
Equity_{t0}	0.070	0.079	0.059	0.063	-0.702	0.053	0.114	-1.045
Loans_{t0}	0.447	0.193	0.425	0.235	-0.469	0.408	0.258	-0.847
Liquidity_{t0}	0.294	0.213	0.357	0.376	0.944	0.331	0.386	0.467
LQuality_{t0}	0.220	0.216	0.283	0.302	1.082	0.217	0.396	0.579
ROAA_{t0}	0.004	0.024	0.006	0.020	0.585	0.013	0.036	1.294
Costs_{t0}	0.681	0.340	0.631	0.352	-0.657	0.766	1.537	0.370
Assets_{t-1}	11.520	0.294	11.291	0.250	-0.587	10.711	2.107	-2.129**
AGrowth_{t-1}	0.000	0.002	0.202	1.392	1.005	0.002	0.003	1.960**
Equity_{t-1}	0.055	0.129	0.058	0.051	0.151	0.066	0.062	0.531
Loans_{t-1}	0.459	0.185	0.439	0.222	-0.461	0.407	0.235	-1.198
Liquidity_{t-1}	0.277	0.197	0.332	0.339	0.967	0.378	0.394	1.509
LQuality_{t-1}	0.046	1.484	0.241	0.223	0.835	0.212	0.344	1.359
ROAA_{t-1}	-0.013	0.088	0.008	0.012	1.707*	0.013	0.034	2.629***
Costs_{t-1}	0.625	0.025	0.588	0.204	-0.955	0.615	0.220	-0.339

Notes: Means and standard deviations of financial variables for the parent banks and the asset-matched and random control samples. The statistical significance of the mean difference is based on a two-tailed paired samples t-test under the null hypothesis of a mean difference of zero. *, **, and *** indicate a significant difference between parent banks' and domestic banks' mean values at the 10%, 5% and 1% levels, respectively.

The results show that parent banks report financial losses one year prior to closing their foreign subsidiaries. One year later, the parent banks report positive financial results again, but their profitability remains, on average, lower than those of local banks in either of the control samples. Therefore, the increase in profitability may be attributed to the divestment of foreign subsidiaries as the liquidity of the parent bank also increases substantially. However, the liquidity of the parent banks remains lower than that of banks from either control sample. After the divestment of the subsidiary, the improved financial standing of the parent banks is also reflected in the capital ratio. One year prior to the closure of the subsidiary, the parent banks are less well capitalized than their domestic peers in both control samples. After the divestment of the foreign subsidiary, the capital ratio of the parent banks increases and exceeds that of the domestic banks in the control samples. Finally, on average, parent banks also report higher loan ratios, which may indicate a higher degree of risk. However, the ratio of nonperforming loans is lower for the parent banks than for the peer banks in the control samples. On the other hand, on average, parent banks exhibit a higher cost-to-income ratio, which may be attributed to lower efficiency.

Summarizing, the results confirm that the exit decision is more likely to be caused by problems of the parent bank rather than by problems with the foreign divested assets. This is suggested by the evidence showing that prior to closing a foreign subsidiary, parent banks report negative results,

which improve in the year of divestment. At the same time, the divested foreign-owned subsidiaries were profitable in comparison to the peer group.

4. Empirical Model

The probability of a parent bank's closing a subsidiary is estimated using the maximum likelihood estimation technique. This method of estimation is advantageous, mainly because the statistical properties of the estimators are both known and desirable. The estimators are consistent and asymptotically efficient and have known asymptotic sampling distributions. This technique is also appropriate due to the undesirable properties of the ordinary least squares estimators when the dependent variable is binary, that is, indicates whether the foreign bank subsidiary is divested or is not. Although linear probability models are still occasionally employed in the case of qualitative choice models, the resulting estimates are not accurate. Several drawbacks are associated with the OLS estimation of the linear probability model, but the primary problem is that the predicted range of values of the dependent variable is not limited to between zero and one.

Two maximum likelihood estimation techniques appropriate for binary choice problems are the logit and probit models. The objective of both models is to determine the probability that a subsidiary will be closed given a set of data. This probability is also assumed to be a linear function of a set of independent variables. The two models are indeed very similar in form and are both based on the maximum likelihood estimation technique (Pindyck and Rubinfeld, 1976). The major difference between the two models is that the probit is based on the cumulative normal probability function, whereas the logit is based on the cumulative logistic probability function. The logistic function is more appealing as it is very similar in form to the cumulative normal function but is computationally more tractable. A unique maximum always exists for the logit model, and almost any nonlinear estimation routine will yield the estimated parameters (Pindyck and Rubinfeld, 1976).

In a study of the failure of small commercial banks, Crowley and Loviscek (1990) show that the logit and probit models offer an advantage over the more frequently used discriminant analysis and linear probability models. The authors, employing the four models and a small sample of bank failures, report that of the four functional forms used in previous studies, the logit and probit models should be preferred over the alternatives. In their study, those two models offered the highest accuracies and nearly identical results, suggesting that the models might be interchangeable. Moreover, Dimitras et al. (1996), in a survey of 158 studies on business failures with an emphasis on prediction methods and industrial application, confirmed that logit and probit models are the predominant methods used in the banking literature and have proven to be quite effective in making predictions.

The logit models predict the posterior (conditional) probability of closure given a set of independent variables for that bank:

$$log(P_i / 1 - P_i) = \alpha + \beta_1 X_j + \beta_2 X_{j, t-1} \tag{1}$$

where P_i is the probability that bank i will be closed, X_j is the set of the jth independent variable in the year of closing the subsidiary and $X_{j, t-1}$ one year prior to it, and b is the coefficient of the independent variables. The coefficient measures the effect on the odds of closure based on a unit change in the corresponding independent variables.

In the regression, we use accounting data for the subsidiary's year of closure and for the year prior. The literature regarding bank failure predicts that financial problems can be identified one year prior to a closure operation. As we assumed that a closing can be attributed to financial problems, we decided to include both years in the model.

As a second estimation technique, we utilize the probit model to identify the probability of closing a foreign bank subsidiary. The motivation for the model in this context is as follows. The decision of the parent bank to close a subsidiary is a function of an unobservable "utility index" Ii, which is itself determined by the explanatory variables included in the model to capture the effects

of a bank's condition - including measures of profitability, efficiency, liquidity, loan quality and capital adequacy. This may be written as

$$I_i = XB \tag{2}$$

where X is a vector of bank characteristics and B is a vector of corresponding estimated coefficients. Given the specification in equation (2), the estimated probability that the foreign bank subsidiary will be closed in country *i* is

$$Pr(Y_i = I) = Pr(I_i^* \leq Y_i) = F(I_i) \tag{3}$$

We used two specifications of the logit and probit models in equations (1) and (2) to test two hypotheses regarding the motivation of the parent bank to close a foreign subsidiary. In addition, the results of the two models are compared to assess the robustness of the results.

5. Results

This section is split into two parts. The first subsection presents results regarding the likelihood of closing a foreign bank subsidiary using the closed foreign bank subsidiary dataset, whereas the second subsection shows the results of the estimations using the parent bank dataset. In all of the regressions, the loss of data from an original sample of 48 instances was the result of missing values for the foreign subsidiaries, parent banks or the control sample.

We estimated all regressions with robust standard errors, allowing for the possibility that observations for the banks may not be independent. Most coefficients have the expected signs, yet only a few of them are statistically significant. However, the summary statistics for the regression show better statistical properties when the asset-matched control sample is used instead of the random control sample.

When logit and probit results are used, Maddala (1988) suggests that their coefficients be scaled so that they can be compared. The procedure of scaling the logit models so that their coefficients can be compared to the probit model requires that all coefficients be multiplied by 0.625. After scaling the results in this manner, the coefficients in the logit model are nearly identical to the coefficients in the probit model. However, the estimated coefficients themselves do not indicate a change in the probability of the event occurring given a one-unit change in the relevant explanatory variable. The sign of the estimated coefficient only indicates the direction of the change in probability. The size of the change in probability will differ based upon the initial values of all of the explanatory variables and their coefficients. Therefore, it is conventional to evaluate the explanatory variables given their mean values as a basis for inferring a change in probability. Consequently, the last column in Tables 6-8 presents the elasticity at means, which indicates the percentage change in the probability of closing a foreign bank subsidiary as a result of a one-percent change in the relevant explanatory variable when all of the variables are evaluated around their mean values.

5.1 Closed Foreign Bank Subsidiary in the Host Country

Table 6 reports the results using data from the year of the foreign bank subsidiaries' closing and data lagged one year. When the asset-matched peer group was used, only six of eight independent variables were statistically significant. The results confirm our previous findings that the profitability of the foreign-owned subsidiaries is not the main reason for divestment by the parent bank. In the year of the exit decision and one year prior, the coefficient of return on assets was positive but was only significant at the 5% level in one instance. This means that the foreign-owned subsidiaries were profitable and were not a burden for the parent bank.

In addition, in the year of the subsidiary's closing, the coefficients of the equity ratio and loans were positive and statistically significant. The growth of equity is not a surprise given the profitability of the subsidiary, whereas the loan ratio shows healthy development of the banking business abroad. However, one year prior to closure, those coefficients were negative and statistically significant. The change in the sign of the coefficient is probably the result of the change in banking policy caused by the divestment and new ownership of the foreign subsidiary. Also, the coefficients of asset size and

growth change their signs between these periods. An extreme volatility of asset growth and equity ratios was also observed by DeYoung (1999) for young foreign-owned banks that were also divested in the year of exit. Moreover, the results are supported by the fact that one year prior to the exit decision, the loans coefficient is positive and statistically significant. In the year of closure, it changes its sign and remains statistically significant. Also, it is interesting to note that the provision for problem loans also changes its sign and remains significant. A similar pattern has been observed in the US when domestic banks are acquired by foreign banks. Peek et al. (1999) interpret these results as a change in the business strategy of the acquired banks, which aims to improve loan quality and initially improve capital ratios. As a consequence, the changes in the coefficients in the year of exit are in line with previous findings and should be attributed to the change in ownership. In the specifications, only the coefficient for the cost-to-income ratio is positive and does not change its sign between the two periods. The positive ratio suggests higher operating costs faced by the foreign subsidiary, which can be attributed to the restructuring charges incurred in the ownership transformation process.

Table 6
Estimations of the likelihood that a foreign bank subsidiary will be closed, using as a control sample both (a) asset-matched and (b) randomly chosen banks from the host country.

	Matched			Random		
Variable	Logit	Probit	dF/dx	Logit	Probit	Elasticity
Size	44.348***	26.400***	5.707	7.425	4.437*	0.962
AGrowth	-37.985***	-22.669***	-4.901	-5.164	-3.058	-0.664
Equity	1.617***	0.950***	0.205	0.328***	0.189***	0.042
Loans	-0.372**	-0.227***	-0.049	-0.066	-0.039	-0.009
Liquidity	-0.014	-0.010	-0.002	-0.016	-0.010	-0.002
LQuality	0.167***	0.101***	0.022	-0.004	-0.003	-0.001
ROA	0.232	0.156	0.034	-0.134	-0.087	-0.019
Costs	0.010**	0.061**	0.013	0.003	0.001	0.000
$Size_{t-1}$	-42.933***	-25.539***	-5.521	-7.471	-4.465*	-0.969
$AGrowth_{t-1}$	6.541**	3.874***	0.838	0.742	0.423	0.092
$Equity_{t-1}$	-1.268**	-0.742***	-0.160	-0.244***	-0.143**	-0.031
$Loans_{t-1}$	0.195*	0.120***	0.026	0.048	0.029	0.006
$Liquidity_{t-1}$	-0.079	-0.045*	-0.010	-0.015	-0.007	-0.002
$LQuality_{t-1}$	-0.095**	-0.057***	-0.012	-0.009	-0.005	-0.001
ROA_{t-1}	0.693	0.401**	0.087	0.074	0.049	0.011
$Costs_{t-1}$	0.127**	0.074***	0.016	0.003	0.002	0.000
Obs	52	52		92	92	
Pseudo R²	0.540	0.544		0.408	0.246	
Wald test χ²	23.690	27.730		16.660	19.440	
Prob.	0.096	0.034		0.232	0.246	
Log pseudolikelihood	-16.410	-16.300		-37.940	-37.860	

Notes: A constant is estimated but not reported. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

Overall, we do not find any evidence that the parent bank's exit decision was determined by the low profitability or financial distress of its foreign-owned subsidiary. Indeed, we find again that the foreign-owned subsidiaries were profitable and well capitalized. In addition, the loan activity was expanding, which was a positive development. Moreover, the statistics show that both models are significant for the asset-matched peer group. In contrast, the summary statistics show weak statistical properties when the random group is used as a control sample, even as the number of observations increases significantly. Therefore, the results indicate that the asset-matched control group may offer an advantage over the randomly chosen sample control group.

5.1.1 Sensitivity Analysis

Because the results do not reveal any significant problems with the foreign-owned subsidiaries, we conclude that closure may be motivated by the financial underperformance of the parent bank in the home country. However, before testing the second hypothesis, we decided to conduct a sensitivity analysis of the existing results. In the sensitivity analysis, we used as a control sample the data for other foreign subsidiaries of the parent bank that were still operating. Once more, we matched the closed subsidiaries to the control group consisting of operating foreign subsidiaries by asset size. We then expanded the control sample, incorporating other randomly selected foreign subsidiaries of the parent bank. However, the foreign subsidiary sample size is much smaller as some of the parent banks did not have any other foreign subsidiaries, resulting in a reduction in the amount of available data.

Table 7 reports the characteristics associated with closed foreign subsidiaries relative to still-operating foreign subsidiaries of the same parent banks. The results show no significant differences between the closed and operational foreign subsidiaries. With the matched sample in the probit regression, the ratio of equity becomes positive in the year of closure.

Table 7
Estimations of the likelihood that a parent bank will close a specified subsidiary, using as a control sample both (a) asset-matched and (b) randomly chosen subsidiaries of the parent bank in other host countries

Variable	Matched			Random		
	Logit	Probit	dF/dx	Logit	Probit	dF/dx
Size	7.413	4.733	1.844	2.939	1.504	0.415
AGrowth	-8.181	-5.161	-2.011	-2.284	-1.243	-0.343
Equity	0.169	0.106*	0.041	0.054	0.027	0.007
Loans	-0.075	-0.045	-0.018	-0.125***	-0.071***	-0.020
Liquidity	-0.031	-0.019	-0.008	-0.058**	-0.032**	-0.009
LQuality	0.015	0.010	0.004	0.012	0.007	0.002
ROA	-0.069	-0.040	-0.016	0.129	0.085	0.024
Costs	-0.009	-0.005	-0.002	0.011	0.006	0.002
$Size_{t-1}$	-7.629	-4.870	-1.897	-3.454	-1.781	-0.491
$AGrowth_{t-1}$	0.780	0.496	0.193	1.366	0.747	0.206
$Equity_{t-1}$	-0.161	-0.099	-0.039	-0.086	-0.045	-0.012
$Loans_{t-1}$	0.018	0.011	0.004	0.112**	0.064**	0.017
$Liquidity_{t-1}$	-0.019	-0.012	-0.008	0.040*	0.022*	0.005
$LQuality_{t-1}$	0.005	0.004	0.001	-0.007	-0.004	-0.001
ROA_{t-1}	0.155	0.096	0.038	-0.249	-0.156*	-0.043
$Costs_{t-1}$	0.016	0.010	0.004	-0.017	-0.010	-0.002
Obs	36	36		76	76	
Pseudo R²	0.223	0.227		0.177	0.174	
Wald test χ²	13.630	15.670		13.910	16.840	
Prob.	0.626	0.476		0.605	0.400	
Log pseudolikelihood	-18.583	-18.475		-34.011	-34.159	

Notes: A constant is estimated but not reported. *, **, and *** denote significance at 10%, 5% and 1%, respectively.

However, when the randomly matched sample is used, the coefficient of loans and liquidity is statistically significant. Again, the loans and liquidity ratios in the year of closure changes its sign, which may signal a change in the operating strategy of the closed subsidiary in the host country. One year prior to closing the subsidiary, the coefficient of return on assets figures significantly in the regression only once, and it does so at the 10% level.

Therefore, the coefficients do not reveal any significant differences between the closed foreign subsidiaries and those that continue to be operated by the parent bank. Furthermore, the summary statistics in all of the regressions show an insignificant relationship between the independent variables and the dependent variables. This means that the performance of the divested subsidiaries

was not different from that of still-operating foreign subsidiaries, all of which were profitable on average. Therefore, the results confirm that the decision to exit foreign markets is more likely to be determined by the underperformance of the parent bank.

5.2 Parent Banks and Domestic Banks in the Home Country

Table 8 reports the results using the parent banks and domestic banks in the home country matched by asset size and also randomly chosen. The results show that one year prior to the closure of a subsidiary, the coefficient of the parent bank's return on assets is negative and statistically significant. In the year of closure, it changes its sign but becomes insignificant. Therefore, the results confirm that the exit decision was driven mainly by the underperformance of the parent bank. In addition, the improvement in the profitability, although its coefficient is insignificant in the exit period, shows that parent banks are troubled banks that are undergoing a restructuring process.

Table 8
Estimations of the likelihood that a parent bank will close its international operations, using as a control sample both (a) asset-matched and (b) randomly chosen banks from the home country.

	Matched			Random		
Variable	Logit	Probit	dF/dx	Logit	Probit	Elasticity
Size	4.055	3.036	1.203	6.040	3.598	1.226
AGrowth	-2.863	-2.149	-0.852	-5.152	-3.057	-1.042
Equity	0.079	0.066	0.026	0.240	0.142	0.048
Loans	0.117	0.066	0.026	0.032	0.021	0.007
Liquidity	-0.008	-0.005	-0.001	0.027	0.015	0.005
LQuality	-0.034	-0.020	-0.008	0.005	0.002	0.001
ROA	0.653	0.400	0.159	0.409	0.244	0.083
Costs	0.008	0.005	0.002	0.043	0.026	0.009
Size$_{t-1}$	-3.650	-2.787	-1.105	-5.442	-3.230	-1.103
AGrowth$_{t-1}$	-4.044***	-2.450***	-0.971	-1.357	-0.831	-0.283
Equity$_{t-1}$	0.498	0.287*	0.114	0.047	0.028	0.009
Loans$_{t-1}$	-0.069	-0.037	-0.015	0.001	-0.001	-0.000
Liquidity$_{t-1}$	0.021	0.012	0.005	-0.001	-0.000	-0.000
LQuality$_{t-1}$	0.030	0.017	0.007	-0.005	-0.003	-0.001
ROA$_{t-1}$	-1.523*	-0.925**	-0.367	-0.552	-0.330*	-0.113
Costs$_{t-1}$	0.082	0.049	0.020	-0.000	-0.001	-0.001
Obs	78	78		108	108	
Pseudo R²	0.280	0.283		0.211	0.215	
Wald test χ^2	25.860	32.540		24.340	29.670	
Prob.	0.056	0.009		0.082	0.019	
Log pseudolikelihood	-38.337	-38.164		-55.724	-55.484	

Notes: A constant is estimated but not reported. *, **, and *** denote significance at 10%, 5% and 1%, respectively.

One element of this process appears to be the divestment of foreign assets despite their being profitable; one factor is that they are probably easier to sell than other assets owned by the parent bank. The selling off of assets may explain why the parent bank's profitability increases in the year of the exit decision, although the coefficient is insignificant. The results are strengthened by the fact that the coefficient of asset growth is negative and statistically significant for the parent bank one year prior to the closure of the foreign subsidiary. In the year of closure, it remains negative and continues to be statistically significant at the 1% level. The negative coefficient of asset growth signals a policy of scaling down the operations of the parent bank in both periods.

The summary statistics for both models suggest once more that the asset-matched control sample provides more significant and probably more reliable results than the randomly matched sample. Nevertheless, the two models and control samples offered almost identical results. Therefore, we document that a parent bank's decision to close its foreign subsidiaries may be motivated by

problems faced in the parent bank's home country. Our empirical findings are intuitive and confirm previous findings, which have assumed that a parent bank's decision to exit foreign markets is driven by problems in the country of origin.

5.3 Robustness Tests

To ensure confidence in the findings, we ran three sets of robustness checks. The first set keeps the exogenous variables and data samples the same as in the main runs but uses econometric methods that are distinct from the maximum-likelihood estimation techniques. The second set uses the main econometric specifications and data samples but alters the specifications of the exogenous variables. The third set uses the main econometric specification and exogenous variables but alters the data samples. The robustness results are summarized here but are not shown in the tables for brevity.

As alternative econometric specifications, we tried the ordinary least squares approach, in which the dummy withdrawal variable was the dependent variable. The results did not change significantly, confirming the poor performance of the parent bank as the cause of the foreign bank's exit decision.

Next, we used alternative specifications of the exogenous variables and tried the following variations: net loans to customer and short-term funding, liquid assets to total deposits and borrowing, loan loss reserves to gross loans, securities to total assets, net interest margin, non-interest expenditure to total assets, overhead expenses to total assets and net interest revenues to average assets. Again, the main results were not altered by the choice of different dependent variables.

We also used a different set of sample data. First, we included subsidiaries from each region separately. The results using this modified dataset are even stronger than the main results. When we include only subsidiaries from Latin American countries, we find that the coefficients of the final specification for the parent bank are statistically significant at the one percent level. The coefficients are also of the same order of magnitude as those in the main results for all specifications. We further restricted the data sample to the years 1999–2002, which marked a period of regional crisis. Again, all coefficients remained unchanged and significant in almost all instances.

In conclusion, the results of the robustness tests confirm the statistically significant relationship between the closing of a foreign bank subsidiary and the probability of the financial distress of the parent bank in its home country. The alternative econometric methods, alternative exogenous variable specifications, and alternative data samples all support the core results of this study.

6. Conclusions

This paper examines the factors that induce multinational banks to divest and exit foreign markets. Using a cross-country sample, we show that the probability of closing or divesting a subsidiary abroad increases if the parent bank reports a decrease in profitability prior to the exit decision. The results are strengthened by the fact that we failed to find any evidence of financial distress or underperformance for foreign-owned subsidiaries in this period. In addition, we were not able to identify any statistical differences between the performance of the divested foreign subsidiary and other still-operating foreign subsidiaries of the parent bank prior to its divestment. Therefore, we conclude that the decision to exit foreign markets is caused primarily by problems within the parent bank.

These findings have important implications. In terms of theory, we contribute to our understanding of an unexplored dimension of multinational banking activity. In terms of practice, the results document that regulators in the host country should place more emphasis in the future on controlling the parent banks' financial situation and their current standing in their home country. It is because parent banks may reallocate their assets to their home country and disclaim obligations to their subsidiaries abroad. Therefore, the study confirms that a worldwide supervision model is needed for multinational banks. This body should be responsible for the supervision of bank holding

companies on a consolidated basis as subsidiaries affect the parent's solvency. We think that the parent should not be able to relinquish all responsibility for its subsidiaries, as was the case in Argentina.

In the context of the recent financial crisis, the results confirm that the problems of parent banks in industrial countries may lead to changes in the structure of the banking sector across countries. However, it remains unclear whether the weakening position of foreign banks will be taken advantage of by domestic banks or will instead be seized by new entrants from abroad. The domination of domestic banks over the crisis-induced consolidation process may lead to a decrease of foreign banks' activities in a number of countries. A similar development of foreign banks' activities was observed by Goldsmith (1969) outside of Europe and North America in the first era of globalization, during the late 19th and early 20th centuries. However, Goldsmith does not go into detail regarding why the foreign banks lost their dominance as local banks gained a foothold over time. The results of this study could provide some explanation for the previous results; however, we did not investigate what happened to those divested foreign subsidiaries. As a consequence, we do not know whether history is repeating itself or whether the importance of foreign banks could decline once again in those countries that have a strong foreign banking presence today. Another interesting direction for future research might be an investigation into how foreign exits influence the performance of domestic banks and the development of the financial system. However, we leave the analysis of the long-term effects of exit decisions to future research.

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References

Asterbo, T., Winter, J.K., 2001, More than a dummy: the probability of failure, survival and acquisition of firms in financial distress. *Working Paper*, University of Waterloo.

Barnes, P., 2000, The identification of U.K. takeover targets using published historical cost accounting data. Some empirical evidence comparing logit with linear discriminant analysis and raw financial ratios with industry-relative ratios. *International Review of Financial Analysis* 9, 147-162.

Calomiris, C.W., Klingebiel, D., Laeven, L., 2005, A taxonomy of financial crisis restructuring mechanisms: cross-country experience and policy implications. In L. Laeven, ed., *Systemic financial distress: containment and resolution*. Cambridge: Cambridge University Press.

Cerutti, E., Dell'Ariccia, G., Soledad Martınez, P.M., 2007, How banks go abroad: branches or subsidiaries? *Journal of Banking and Finance* 31, 1669–1692.

Claessens, S., Van Horen, N., Gurcanlar, T., Mercado Sapiain, J., 2008, Foreign bank presence in developing countries 1995-2006: data and trends. *mimeo*, The World Bank.

Claessens, S., Demirgüç-Kunt A., Huizinga H., 2001, How does foreign entry affect domestic banking markets? *Journal of Banking and Finance* 25, 891-911.

Clarke, G., Cull R., Molinaria A., 1999, The effect of foreign entry on Argentina's domestic banking sector. *Policy Research Working Paper* 2158, The World Bank

Crowley, F.D., Loviscek A. L., 1990, New directions in predicting bank failures: the case of small banks. *North American Review of Economics and Finance* 1 (1), 45-162.

Crystal, J.S., Dages B.G., Goldberg L. S., 2001, Does foreign ownership contribute to sounder banks in emerging markets? The Latin American experience. *Staff Reports* no 137, Federal Reserve Bank of New York.

Cudd, M., Duggal R., 2000, Industry Distributional Characteristics of Financial Ratios: An Acquisition Theory Application. *The Financial Review* 41, 105-120.

Dages, B.G., L. Goldberg, D. Kinney, 2000, Foreign and domestic bank participation in emerging markets: Lessons from Mexico and Argentina. *Federal Reserve Bank of New York Economic Policy Review,* 17–36.

DeYoung, R., 1999, Birth, growth, and life or death of newly chartered banks, *Federal Reserve Bank of Chicago Economic Perspectives* 23(3), 18-35.

Demirgüç-Kunt, A., Huizinga H., 1999, Determinants of commercial bank interest margins and profitability: some international evidence. *World Bank Economic Review* 13(2), 379-408.

Dimitras, A.I., Zanakis, S.H., Zopounidis, C., 1996, A survey of business failure with an emphasis on prediction methods and industrial application. *European Journal of Operational Research* 90, 487–513.

Dopico, L.G., Wilcox J.A., 2002, Openness, profit opportunities and foreign banking. *Journal of Financial Markets, Institutions, and Money* 12(4-5), 299-320.

Dunning, J. 1977, Trade, location of economic activity and the MNE: a search for an eclectic approach. In: Ohlin B., Hesselborn P., Wijkman P., eds., *The international allocation of economic activity*, London: MacMillan Press, 395–431.

Engwall, L., Marquardt R., Pedersen T., Tschoegl A.E., 2001, Foreign bank penetration of newly opened markets in the Nordic countries. *Journal of International Financial Markets, Institutions and Money* 11, 53–63.

Goldsmith, R.W., 1969, *Financial structure and development*. New Haven: Yale University Press.

Kocagil A.E., Reyngold, A., Stein, R.M., Ibarra, E. 2002, Moody's RiskCalcTM Model for privately-held U.S. banks in Moody's Investors Service, *Global Credit Research*, July.

Hannan T., Rhoades, S., 1987, Acquisition targets and motives: the case of the banking industry. *The Review of Economics and Statistics* 69, 67-74.

Haas De, R., Van Lelyveld, I., 2010. Internal capital markets and lending by multinational bank subsidiaries, *Journal of Financial Intermediation* 19(1), 1-25.

Horen Van, N., 2007, Foreign banking in developing countries: origin matters. *Emerging Markets Review* 8, 81–105.

Lensink, R., Hermes, N., 2004, The short-term effects of foreign bank entry on domestic bank behaviour: does economic development matter? *Journal of Banking and Finance* 28(3), 553-568

Leung, M. K., Young, T., Fung, M. K., 2008, The entry and exit decisions of a foreign bank in Hong Kong. *Managerial and Decision Economics* 29(6), 503 – 512.

Maddala, G.S, 1988, *Introduction to econometrics,* New York: Macmillan.

Makler, H.M., Ness Jr., W.L., 2002, How financial intermediation challenges national sovereignty in emerging markets. *The Quarterly Review of Economics and Finance* 42(5), 827-851.

Martin D., 1977, Early warning of bank failure. A logit regression approach. *Journal of Banking and Finance* 1, 249-276.

Pindyck R.S., Rubinfeld, D.L., 1976, *Econometric models and economic forecasts*, New York: McGraw-Hill.

Peek, J., Rosengren, E.S., Kasirye, F., 1999, The poor performance of foreign bank subsidiaries: were the problems acquired or created? *Journal of Banking and Finance* 23(2-4), 579-604.

Peek J., Rosengren, E.S., 1997, The international transmission of financial shocks: the case of Japan. *American Economic Review* 87(4), 495-505.

Peek J., Rosengren, E.S., 2000, Collateral damage: effects of the Japanese bank crisis on real activity in the United States. *American Economic Review* 90(1), 30-45.

Platt H.D., Platt, M.B., 1990, Development of a class of stable predictive variables: the case of bankruptcy prediction. *Journal of Business Finance and Accounting* 17, 31-51.

Stein, S.J., 1997, Internal capital markets and the competition for corporate resources. *Journal of Finance* 52(1), 111-133.

Tschoegl, A.E., 2004, The California subsidiaries of Japanese banks: a genealogical history. *Journal of Asian Business* 20(2), 59-82.

Tschoegl, A.E., 2005, Financial crises and presence of foreign banks In P. Honohan and L. Laeven, eds. *Systemic financial distress: containment and resolution*, Cambridge: Cambridge Univ. Press.

Unite, A.A., Sullivan, M.J., 2002, The effect of foreign entry and ownership structure on the Philippine domestic banking market. *Journal of Banking and Finance* 27, 2249- 2271.

Williams, B., 1997, Positive Theories of multinational banking: eclectic theory versus internalization theory. *Journal of Economic Surveys* 11(1), 71–100.

Wheelock, D.C., Wilson, P.W., 2004, Consolidation in US banking: Which banks engage in mergers? *Review of Financial Economics* 13, 7-39.

Wheelock, D.C., Wilson, P.W. 2000, Why do banks disappear? The determinants of U.S. bank failures and acquisitions. *The Review of Economics and Statistics* 82, 127-138.