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When are multinational banks getting
a bang for their buck on their
subsidiaries abroad?

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Abstract

This paper investigates whether foreign subsidiaries outperform their parent banks in terms of profitability and what determines this outcome. Using a large sample of multinational banks and their subsidiaries in a large number of countries, this study shows that, on average, foreign subsidiaries are less profitable than their parent banks are. At the same time, however, foreign subsidiaries have higher net interest margins but also higher overhead costs relative to their parent banks. One explanation for the results is that parent banks transfer income banks using overhead costs, what may explain the existing results. Moreover, the results show that foreign subsidiaries tend to perform better than their parent banks if the latter are underperforming in the home market. Finally, the results show that the determinants of the profitability of the subsidiary in relation to its parent bank are strongly determined by the origins of the parent bank and, to a lesser extent, by the host market's characteristics as well as the distance to the home country of the multinational bank.

Keywords: international banking, foreign banks, subsidiary, performance

JEL Classification: F21, F23, G21

1. Introduction

It is generally assumed that multinational banks expand abroad with the aim of increasing their overall profitability. Hence, many studies have compared the performance of foreign banks to domestic banks in host markets and have found contradictory results. In developing countries, most empirical studies have shown that foreign banks tend to outperform domestic banks in terms of profitability and efficiency. On the contrary, in developed countries, studies show that foreign subsidiaries tend to perform poorly when compared to their domestic counterparts (Classens and van Horen, 2009). None of the existing studies, however, have presented how the foreign subsidiaries perform in relation to their parent banks, which may be important in understanding why banks expand abroad even though they may underperform in the host markets in comparison to domestic banks.

Focarelli and Pozzolo (2001) argues that efficient, profit-maximizing banks are more likely to expand abroad to seek higher profits. To do so, those banks must devote capital to their foreign subsidiaries. Hence, it may be expected that the funds will only be devoted to the host nation if the parent bank expects these to earn a higher rate of return than in the home market. As the authors suggest, since only the most profitable and efficient multinational banks are expanding abroad, it may be expected that the foreign-owned subsidiaries should significantly outperform their parent banks abroad.

Nevertheless, to date, the relationship between the parent bank and its subsidiaries abroad has received little attention in the literature. Therefore, little is known on whether foreign subsidiaries are outperforming their parent banks in terms of profitability and, if so, what determines the result. This study tries to fill the existing gap by considering the performance and factors that determine the profitability of the subsidiaries abroad relative to their parent banks. Specifically, this study examines the differences in the performance between the foreign-owned subsidiaries and their parent banks, measured in terms of profitability and overhead costs, in a large group of countries over the period between 1989 and 2008. In the regression framework, the effects of bank-specific, ownership-specific and macro-determinants on profitability are analyzed, and the large number of countries in the panel enables to exploit the variation in host and home country characteristics.

The results of this study reveal that, on average, foreign bank subsidiaries are less profitable than their parent banks. Indeed, the results show that what determines the subsidiaries' profitability is the inefficiency of the parent bank in the home market. This

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means that foreign subsidiaries are outperforming their parent banks only if the latter is underperforming in the home market. The results, however, also show that, in countries with high corporate taxes, the overhead costs of the subsidiaries are significantly higher, which may explain overall underperformance in relation to the parent bank. Consequently, this result may also suggest that the parent bank may transfer profits from high to low tax areas, which could explain the underperformance of foreign subsidiaries. These findings are supported by the fact that, on average, foreign-owned subsidiaries perform significantly better in terms of net interest income than their parent banks; in the case of noninterest income, the differences are not statistically significant. Moreover, the results also reveal that the macroeconomic factors of the host country as well as the geographical and cultural distance between the host and home countries are less important in explaining the relative performance of foreign banks to parent banks. On the other hand, some of those factors were found to be important in understanding the performance of the foreign-owned subsidiaries, yet they were determined by the region where the entity operates and the country of origin of the parent bank.

The results of this study add to the literature in several ways. Most important, it extends the literature on the performance of foreign banks by showing the results in relation to the parent bank, which has been ignored in the past. Second, it expands the limited literature on the ownership factors that affect a foreign bank's ability to operate in a host country, as expressed in Williams (2003) and Sturm and William (2010). In this study, I explicitly analyze the impacts of some specific parent bank characteristics, and the results reflect evidence from a large number of countries. As such, it provides an explanation for some of the contradicting results found in the literature in the past. Third, by studying the impact of macroeconomic factors and the distance between home and host markets, the study contributes to the rapidly increasing literature on their impact on the performance of foreign banks. Finally, most studies focus only on developed or developing countries or both groups at the same time. In this study, the sample is divided not only according to the operation of the foreign-owned subsidiary but also according to the region of origin of the parent bank.

I organize the rest of the paper as follows. The next section reviews the theoretical predictions regarding the factors that may affect foreign bank performance. Section 3 describes the variable selection used in this study. Section 4 introduces the data and presents univariate statistics. Section 5 presents the estimation method and the empirical results, while Section 6 concludes the paper.

2. Literature review

In the literature on multinational banking, the determinants of banks' profitability are usually dichotomized into internal and external factors. The internal factors focus on bank-specific features, while external factors consider the location-specific factors. I discuss them all briefly in what follows.

The research on internal-specific factors emphasizes the importance of banks' assets and liabilities structures on their performance. It argues that foreign banks differ in the funding and asset mix from domestic banks, which can be an explanation for its underperformance in some of the foreign markets. DeYoung and Nolle (1996), for example, argue that, in the US, foreign banks are less profit efficient as a consequence of their reliance on purchased funds. In Europe, Molyneux et al. (1998) present evidence that the profitability of foreign banks is related to their capital ratios, commercial and industrial loan growth, and asset portfolio composition. Individual country studies confirm that more profitable banks have, on average, lower costs of funds, greater use of transaction deposits, more marketable securities and higher capitalization (Wall, 1985).

The ownership specifics are related to the parent bank's characteristics, which may affect the performance of their subsidiaries abroad. Ursacki and Vertinsky (1992) documented that the most important variables determining the timing of foreign bank entry into a host market are the size and the existing level of geographical diversification of the parent bank. Later, Berger et al. (2000) suggested that there is some evidence showing that banks that perform well at home also perform well abroad. Minh To and Tripe (2002) argued that a more profitable bank could result in increased profitability in foreign markets. The positive impact of the parent bank's profitability on foreign subsidiaries was confirmed by Kosmidou et al. (2007). On the contrary, Williams (2003) did not find parent bank profits to affect foreign subsidiaries in Australia. Hence, the studies on the effects of the parent bank on their subsidiaries in the host markets are not only scarce but also inconsistent.

The impact of macroeconomic variables and host country financial structures on bank performance has been highlighted by Demirgüç-Kunt and Huzinga (1999), who reported that macroeconomic and regulatory conditions have a pronounced impact on profitability and margins. In particular, they found that foreign banks have higher margins and profits as compared to domestic banks in developing countries, while the opposite holds in developed countries. Furthermore, the authors documented that lower market concentration ratios lead to lower margins and profits, while the effect of foreign ownership varies between industrialized and developing countries.

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Recently, the distance between host and home market has also been considered as an additional location-specific advantage. The reason for this is that the cost of monitoring investment grows with distance. Consequently, since the cost of monitoring clients is higher in distant markets, it should constitute a barrier to entry and as a result makes banks less willing to invest in countries far away from the home market. Moreover, Berger et al. (2001) suggested that efficiency barriers, such as geographical distance, different languages and cultures, or regulations, impede cross-border activity and therefore offset some of the gains of cross-border consolidation. Those assumptions were confirmed by Correa (2008), who showed that, in industrialized countries, the postacquisition performance of cross-border banks is higher when host and home country share the same language but is lower when they share the same legal system.

Overall, the existing literature provides a rather comprehensive account of the effect of internal and location-specific determinants on bank profitability, but the effects of ownership (parent) are not very well known. Therefore, the focus of this study is to unify all of these factors into a single model in order to provide new insight on the factors that affect foreign subsidiaries' profitability relative to their parent banks.

3. Determinants and variable selection

The aim of the study is to establish the determinants of profitability of foreign subsidiaries relative to the performance of the parent bank. I do this using a dependent variable, which is the difference between the profitability of the foreign-owned subsidiary and its parent. As the profitability measure, I consider the bank's return on assets (*ROA*), which is calculated using the profit before taxes, and therefore eliminates any possible influence of the different tax systems in the results of the analyses. Moreover, *ROA* is not distorted by high equity multipliers, and hence represents a better measure of bank performance than the alternative proxy, which is the return on equity (Rivard and Thomas, 1997). On the other hand, *ROA* may be biased due to off-balance-sheet activities, yet I believe such activities are negligible in banks' subsidiaries abroad.

Nevertheless, two additional dependent variables are used in the study to measure the efficiency of the foreign subsidiaries. The difference in net interest margin between the foreign subsidiary and its parent bank (*NIM*) is employed as an alternative measure of profitability. The difference in overhead costs of the foreign subsidiary and the parent banks (*Costs*) is used to measure cost efficiency, whereas the ratio was calculated by dividing it by the total assets. Both variables have a significant impact on the profitability of the subsidiary abroad and may also be influenced by the ownership effects.

As for the potential determinants of bank performance, the literature suggests that such determinants are internal bank-specific factors, ownership-specific factors and location-specific factors. Considering those factors in turn, the chosen set of independent variables is discussed. A description of all of the variables provides Table 1.

3.1. Internal bank factors

First, I control for bank-specific characteristics to see whether they determine the performance of the foreign subsidiary using *Equity*, *Deposits*, *Loans* and *Securities* to total assets as well as the log of the total *Assets*. Based on the existing literature, all of the variables should positively influence subsidiaries' performance abroad.

Berger (1995) has shown that well-capitalized banks provide a signal to the market and document positive causation in both direction between capital and profitability. DeYoung and Nolle's (1996) results implied that foreign banks had a distinct disadvantage primarily driven by excess expenditures on purchased funds as they lacked the ability to build their base of core deposits in the host country. Similar findings were presented by Peek et al. (1999), who reported that banks acquired by foreigners depend

less on core deposits and more on purchased funds than domestic banks do. In addition, both studies documented that foreign banks were conducting an aggressive loan policy, which, combined with their funding structures, may be a reason why they were underperforming in comparison to their domestic peers. On the other hand, studies using developing countries as a sample show that foreign banks are profitable despite their average stronger loan growth and lesser reliance on deposits than domestic banks (Crystal et al., 2001).

Crystal et al. (2001) shows that foreign banks are holding higher levels of liquid assets, which they associate with greater reliance on potentially more volatile nondeposit borrowing. Moreover, high levels of liquid assets are usually associated with lower profitability. A negative and significant relationship between the level of liquidity and banks' profitability was documented by Molyneux and Thornton (1992), but in contrast, Bourke (1989) has shown opposite results.

As for liquidity, the results obtained in the literature for the relationship between size and profits are diverse. Smirlock (1985) documented a positive and significant relationship between size and bank profitability. By contrast, Berger et al. (1987) find that as product mixes and scales increase, banks experience some diseconomies, implying a negative relationship between size and returns.

3.2. *Ownership-specific factors*

Second, I control for parent-specific factors using the same set of bank level variables as for the foreign-owned subsidiary. In contrast to the internal factors, the existing studies present limited evidence on the parents' effects on subsidiaries' performance. I use parent banks *Equity*, *Deposits* and *Assets* ratio proxies for subsidiaries' access to cheap funds and expect this to be positively related to their profitability. By contrast, I expect *Loans* and *Securities* to be negatively related to subsidiaries' performance as they may signal the higher profitability of the home market banking operation than of the host market.

As for evidence, Ursacki and Vertinsky (1992) found parent size to be important in determining the size of subsidiaries in the host nation, whereas Williams and Sturm (2010) found it to be insignificant. Recently, de Haas and van Lelyveld (2010) provided evidence for the existence of internal capital markets through which multinational banks manage the credit growth of their foreign subsidiaries. They show that foreign subsidiaries expand lending faster when economic growth in the parent bank's home country decreases, yet the results for the substitution effects were weak.

In addition to the bank-level variables, three different variables are used to control for parent efficiency in the home market, which may provide a source of competitive advantage in the host markets (Minh To and Tipe, 2002). The difference in the return on assets (*dROA*) or net interest margin (*dNIM*) of the parent bank and the industry in the home market is used to control for parent's profitability efficiency when either ROA or NIM is employed as a dependent variable. It is expected that those two variables are positively related to foreign subsidiaries' performance, yet the existing results are again mixed. Williams and Sturm (2010) did not find that parent profitability has any effect on foreign bank performance in Australia; by contrast, Kosmidou et al. (2007) found it to be significant for foreign subsidiaries of Greek multinational banks.

Following Williams' and Sturm (2010) argumentation, it is possible that foreign bank parent efficiency, as measured by profitability, does not increase foreign bank profits in the host market but does increase foreign bank efficiency. To control for this effect, a variable is used that reflects the difference between the overhead costs of the parent bank and the industry in the home market (*dCost*). This variable is used when *Cost* is employed as the dependent variable in the regression, whereas a negative relationship is expected. In other words, it is expected that cost-efficient parent banks will more likely have even more cost efficient subsidiaries abroad, and vice versa.

3.3. *Macroeconomic and industry-specific factors*

Third, the impact of macroeconomic and industry-specific factors on bank performance has recently been highlighted in the literature. The variable log of population (*Population*) and the level of *GDP* per capita capture the potential for scale economies in the host country (Buch and DeLong, 2004). *Economic Growth* is used as a proxy for the attractiveness of the local market. Moreover, the marginal corporate tax rate (*Tax*) is added to control for possible intra-group transfer pricing, which may influence the probability. Hence, it is expected that corporate tax is negatively related to subsidiaries' profitability, whereas the first three proxies are not.

Next, three measures are incorporated to represent the host country's financial industry characteristics and development. The level of liquid liabilities to GDP (*M3*) measures the financial system development, while a dummy, *Crisis*, controls for financial crises in the host country. De Haas and van Lelyveld (2010) have shown that foreign banks are not negatively affected by systemic banking crises in the host countries, as they have a different structure of assets and liabilities than domestic banks do. Moreover, the

share of the five largest banks in total assets of the banking sector is used to measure concentration (*CR5*), as Berger (1995) provided evidence that superior management and increased market share raise profits. Hence, all three variables are expected to be positively related to subsidiaries' profits.

3.4. *Distance factors*

Classens and van Horen (2009) documented that the relative performance of foreign banks is better when the geographical, cultural and institutional distance is small. In contrast, they showed that foreign banks perform better when the economic distance is large, whereas the parent's home country has a higher level of development than the host country. To control for the effects of distance, the following four explanatory variables are included.

Geographical and cultural aspects are represented using *Sregion*, which equals one if host and home countries are located in the same region as defined by the World Bank, while *Slanguage* is one if the official language in both countries is the same. Those two variables represent the information costs (Buch and DeLong, 2004), but the institutional aspects may also be important (Mian, 2006). Therefore, a dummy, *Slaw*, is used, which equals one if the countries have the same legal origins, to control for the differences in the institutional environment in the host countries. Finally, Classens and van Horen (2009) note that bank origin matters for banking efficiency and profitability and show that foreign banks outperform domestic banks when they come from more developed countries. On the other hand, Sturm and Williams (2010) reported contradicting evidence, so this issue needs to be clarified. The economic distance proxy dummy, *Deconomy*, equals one if the home market has the same or a higher level of economic development than the host market and equals zero otherwise, whereas the division between the countries is made using the World Bank's classification in 2009.

Table 1
Variables definition

Variables	Description
<i>Dependent</i>	
ROA	The difference in return on assets of the foreign subsidiary and parent bank, where ROA is calculated as pretax income divided by total assets
NIM	The difference in net interest margin between the foreign subsidiary and its parent bank, where NIM is calculated as net interest income divided by total assets
Cost	The difference in overhead costs between the foreign subsidiary and its parent bank, where cost is calculated as overhead costs divided by total assets
<i>Foreign bank level intern and ownership specific factors</i>	
Loans _{s,p}	Total loans divided by total assets of the foreign subsidiary <i>s</i> or its parent bank <i>p</i>
Deposits _{s,p}	Total deposits divided by total assets of the foreign subsidiary <i>s</i> or its parent bank <i>p</i>
Securities _{s,p}	Total securities divided by total assets of the foreign subsidiary <i>s</i> or its parent bank <i>p</i>
Assets _{s,p}	Natural logarithm of the total assets of the foreign subsidiary <i>s</i> or parent bank <i>p</i>
dROA	The difference in return on assets of the parent bank and the average value for all banks in the home country
dNIM	The difference in net interest margin between the parent bank and the average value for all banks in the home country
dCost	The difference in overhead costs between the parent bank and the average value for all banks in the home country
<i>Location (host country) and distance specific factors</i>	
Population	Logarithm of population
GDP	Logarithm of GDP per capita
Growth	Annual growth rate of GDP
Tax	Highest marginal corporate tax rate
M3	Liquid liabilities to GDP
CR5	The concentration ratio calculated by dividing the assets of the five largest banks with the total assets of all banks
Crisis	Dummy which is 1 if a bank crisis is present in the host country, 0 otherwise
Sregion	Dummy which is 1 if home and host country share the same region, 0 otherwise
Slanguage	Dummy variable set equal to 1 if official language of both host and home country is the same, 0 otherwise
Slaw	Dummy variable set equal to 1 if the same legal system prevails in the home and host country, 0 otherwise. Legal systems considered are (by origin): English, Russian, French, German, and Scandinavian
Deconomy	Dummy variable set equal to 1 if host country has the same or higher level of economic development than the home country, 0 otherwise

The data for calculating the bank specific variables were obtained from BankScope database. The data for country-specific variables were obtained from Beck and Demirgüç-Kunt (2009), CIA Factbook (2010), Laeven and Valencia (2010) and World Bank Development Indicators.

4. Data and univariate statistics

To select the multinational banks that constitute the sample of the study, a list of the world's 150 largest banks (asset rank) was prepared using the 2008 ranking of banks published by the magazine *The Banker*. From this list, multinational banks were selected for further examination if they owned at least 50 % in one bank abroad, and the financial statement for the bank and its foreign subsidiary was available in the BankScope database. Moreover, for the parent bank, unconsolidated financial data were retrieved, whereas for the foreign subsidiaries, consolidated financial statements were used in further computation. In the construction of the dataset the author followed Haas and Lelyveld (2010), who analyzed interbank capital markets inside multinational banks.

Using this approach, a final sample was constructed that included 62 multinational banks, mainly from the US, Western Europe and East Asia, and 288 subsidiaries in developed and developing countries. Additional country-specific and market-specific data were drawn mainly from the WDI database as well as from the World Bank's Financial Structure Database (Beck and Demirgüç-Kunt, 2010). A sample of 1,533 observations on each variable made up an unbalanced panel covering the period between 1989 and 2008, whereas in some of the regressions, the number is reduced because all of the variables were not always available for the multinational banks in the sample.

4.1. Univariate results

Table 2 displays panel means and standard deviations for the multinational banks and foreign subsidiaries. The last column in the table presents the results of t-statistic tests for the difference in the means between the parent bank and its subsidiary, whereas the results confirm that both groups differ significantly in terms of profitability, costs, assets and liabilities structures.

The ROA for the parent banks is almost four times higher than that of their foreign subsidiaries, and therefore they seem at first to be more profitable. Kosmidou et al. (2007) reported similar results, in which he also documented that the median ROA for Greek bank subsidiaries was lower than its parent bank. At the same time, however, parent banks have significantly lower NIM than their subsidiaries. As net interest income constitutes the largest part of the banks' income, the underperformance of subsidiaries in comparison to the parent bank can be seen as unusual. In particular, the level of noninterest income does not differ significantly between the parent bank and its subsidiaries. In addition, foreign subsidiaries have lower loan loss reserves than their

parent banks. As a result, higher overhead costs seem to be the only explanation, which explains the observed lower profitability of the subsidiary relative to the parent banks. The results may thus indicate that either operating abroad is very costly or multinational banks use overhead expenses to transfer some of the income to the home markets, which could also explain the reported underperformance of foreign subsidiaries in comparison to domestic banks in some of the existing studies.

Table 2
Summary statistics and univariate comparison

Variables	N	Parent		Subsidiary		Differences	
		mean	st dev	mean	st dev	mean	st dev
Pretax income	3585	0.045	0.125	0.016	0.055	0.029***	0.135
Net interest income	3118	0.024	0.049	0.029	0.038	-0.004***	0.061
Non-interest income	3192	0.017	0.074	0.022	0.276	-0.005	0.281
Overhead costs	3133	0.021	0.030	0.050	0.220	-0.029***	0.222
Loan loss provisions	2670	0.087	0.332	0.007	0.030	0.080***	0.336
Tax	2819	0.002	0.008	0.005	0.010	-0.002***	0.013
Equity	4154	0.230	0.314	0.126	0.128	0.104***	0.344
Loans	3071	0.413	0.190	0.428	0.239	-0.016***	0.305
Deposits	3067	0.586	0.217	0.712	0.216	-0.126***	0.321
Securities	2911	0.180	0.098	0.192	0.189	-0.013***	0.211
Assets	4007	11.500	1.777	7.009	1.897	4.491***	2.466

Note: All variables presented as a percentage of total assets with the exception of the variable assets, which was calculated as log of total assets. ***, **, * indicate significant difference between means for the parent bank and its subsidiaries at the 1%, 5% and 10% levels, respectively, in a two-tailed test.

The foreign subsidiaries also differ significantly from their parent banks in terms of their assets and liability structures. The volume of total assets and capital ratios of the parent bank is significantly higher than it is in the subsidiaries, which could be attributed to the different models of operation in host markets. It may also explain why parent banks produced slightly fewer loans as a percentage of total assets than did their foreign subsidiaries. Surprisingly, however, foreign subsidiaries have significantly higher deposits as a percentage of assets than parent banks do. Indeed, Demirgüç-Kunt and Huzinga (1999) reported that those foreign banks that had higher levels of deposits also had higher levels of overhead costs, which they attributed to high branching expenses. Hence, the high level of deposits may be another explanation for the high overhead costs of the foreign subsidiaries in comparison to the parent banks. Moreover, the high level of deposits may also explain the reason for the higher level of securities held by subsidiaries relative to parent banks, which additionally may have a negative impact on profitability.

Those results contradict, however, those of Peek et al. (1999), who documented that, in the US, foreign banks have problems attracting deposits and, as a result, were underperforming in comparison to domestic banks.

Overall, the results confirm that parent banks differ to a large extent from their foreign subsidiaries in terms of profitability, costs and balance sheet structures. As a result, the question of what determines the profitability of foreign subsidiaries relative to their parent banks seems to be justified and is important from a management point of view.

5. Methodology and empirical results

I investigated the determinants of the performance of foreign subsidiaries relative to their parent banks using the following specification:

$$\Delta Performance_{i,j,f,t} = \alpha_0 + \beta_1 S_{i,f,t} + \beta_2 P_{j,h,t} + \beta_3 PP_{j,h,t} + \beta_4 H_{f,t} + \beta_5 HH_{f,t} + \varepsilon_{i,t}$$

where $\Delta Performance$ is one of the three variables calculated as the difference in the performance of the subsidiary i in host country f and its parent bank j in home country h at time t ; S_i and P_j are bank-level variables showing the asset and liability structure of the subsidiary and its parent bank; PP are variables calculated as the differences in efficiency variables for the parent bank and the average values for all banks in the home country; H_f are country variables for the host country; HH is a matrix of dummy variables that captures the distance between the home and host country. Furthermore, α_0 is a constant, and $\varepsilon_{i,t}$ is an error term.

The main specification was estimated using the fixed effects model, whereas the preference for it over a random effects model was based on the use of Breusch-Pagan and Hausman tests (Baltagi, 2001). The fixed-effects estimator is robust in the omission of any relevant time-invariant regressors (Johnston and DiNardo, 1997). On the other hand, a fixed-effects model removes any effect associated with time-invariant explanatory variables, while a random-effects model considers the association between these variables and the dependent variable. Hence, I accepted the less restrictive random effects model in the study and take those variables into account. To control for serial correlation, I clustered the robust standard errors by the multinational bank.

A more generic generalized-method-of-moments (GMM) approach was also considered, yet its use with small sample sizes and a large number of instruments as in this study has generated results that appear valid but could be invalid (Roodman, 2009). In addition, whereas the GMM procedure may be more efficient than a fixed or random effects model when either heteroskedasticity or serial correlation are present, Woolridge (2001) argues that since basic econometric methods can use robust inference techniques, thus allowing for arbitrary heteroskedasticity or serial correlation, the gains from using GMM may be immaterial.

5.1. Basic empirical results

In the first three columns of Table 3, the results are presented for estimations using the fixed effects regression, while the next three columns show the results of estimations using the random effects regression with time-invariant variables. The specification (4) and (8) show additional regressions' analyzing the relationship between foreign subsidiaries' profitability and their parent bank's cost efficiency, whereas they are estimated using fixed and random effects regressions, respectively.

Among the foreign bank internal factors, the results show that well-capitalized subsidiaries with a low level of deposits have higher net interest margins than the parent banks, yet the results also document that this does not translate into higher profitability. One explanation for the results could be high overhead costs, which could be related to the transaction costs of financing the foreign operations. Also, the size of the subsidiary seems to have an effect on costs but not on profitability. The results show that smaller banks have lower overhead costs, yet the coefficient is negative and significant only in the fixed effects regression.

The ownership-specific variables $dROA$ and $dNIM$ presenting the performance of the parent bank in the home markets are significant, yet they are negatively related to the subsidiaries' profitability. This means that foreign subsidiaries are outperforming the parent bank when the latter is underperforming relative to its peers in the home market. Consequently, it seems that the ownership factor is not an advantage in the first place and does not have an impact on subsidiaries' performance abroad. On the other hand, the results also suggest that going abroad may improve the results of multinational banks, which underperform in the home market. It could also explain why banks decide to expand abroad even as their subsidiaries underperform as compared to domestic banks.

Although the overall performance has a negative effect on the subsidiary, the cost efficiency does not. The variable $dCosts$ remains insignificant in all of the regressions even as ROA is used instead of $Costs$ as the dependent variable. Consequently, the results show that the cost efficiency of the parent bank in the home market does not have a significant impact on the profitability of its subsidiary abroad.

Indeed, the results also reveal that the effects of parent bank assets or its structures on its foreign subsidiaries' profitability are weak. The lack of size effects on subsidiaries is consistent with the previous results of Williams (1998) and Kosmidou (2007). On the other hand, the effects of size seem to be consistent, and the coefficient $Assets_p$ is always positive yet is only significant once. By contrast, the results show that well-capitalized

parent banks have less profitable foreign subsidiaries. An explanation for the results could be that the low profitability of the subsidiaries may hinder multinational banks to invest further funds abroad, which could explain their high capitalization.

The location-specific variables are important only to some extent. The results show that declining economic growth as well as a financial crisis in the host countries positively affects the net interest margins of the subsidiary. Hence, the results confirm that subsidiaries are less prone to hosts' economic cycles. One explanation for the results is that subsidiaries have a different structure for loans than domestic banks do, which allows them to keep their profitability high during economic downturns (Clarke et al., 2001). Indeed, it may be assumed that subsidiaries, due to the support of the parent bank, may use the economic uncertainty in the host country to increase their market share as well as their interest margins.

An interesting relationship is presented with the variable *Tax*, which is positive and statistically significant when costs are used as the dependent variable. It means that subsidiaries have higher overhead costs in host countries with higher corporate taxes. Consequently, this finding may signal transfer pricing from foreign subsidiaries and may explain to some extent the low profitability observed in many studies.

Finally, none of the models supports the effects of the similarities and distance between the host and home markets on foreign bank performance. Apparently, those variables are important only under some conditions, which will be explored by dividing the multinational banks and subsidiaries into subsamples.

Table 3
Foreign subsidiaries performance relative to its parent bank

Dependent variable	Fixed-effects regression				Random-effects regression			
	(1) ROA	(2) NIM	(3) Costs	(4) ROA	(5) ROA	(6) NIM	(7) Cost	(8) ROA
Equity _s	0.05 (0.04)	0.08*** (0.02)	0.27** (0.12)	0.05 (0.04)	0.07 (0.06)	0.06*** (0.02)	0.24** (0.10)	0.07 (0.06)
Loans _s	0.02 (0.01)	0.01 (0.01)	0.00 (0.02)	0.02 (0.01)	-0.01 (0.02)	0.01 (0.01)	-0.01 (0.01)	-0.01 (0.02)
Deposits _s	0.01 (0.01)	-0.02** (0.01)	0.03 (0.03)	0.00 (0.01)	0.00 (0.01)	-0.02* (0.01)	0.00 (0.02)	0.00 (0.01)
Securities _s	-0.01 (0.02)	-0.01 (0.01)	0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.01)	-0.02 (0.02)	-0.01 (0.02)
Assets _s	0.00 (0.00)	-0.00 (0.00)	-0.01** (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Equity _p	-0.06 (0.06)	0.00 (0.04)	-0.04 (0.08)	-0.11* (0.07)	-0.05 (0.03)	-0.02* (0.01)	0.10* (0.06)	-0.10*** (0.03)

Loans _p	-0.01 (0.02)	0.00 (0.01)	-0.04 (0.03)	0.00 (0.02)	0.01 (0.01)	0.00 (0.01)	-0.03 [*] (0.02)	0.01 (0.01)
Deposits _p	0.01 (0.02)	-0.01 (0.01)	-0.04 (0.03)	-0.00 (0.02)	0.01 (0.01)	0.00 (0.01)	-0.01 (0.02)	-0.00 (0.01)
Securities _p	-0.05 (0.06)	0.01 (0.02)	-0.01 (0.05)	-0.05 (0.06)	-0.03 (0.04)	-0.02 (0.01)	0.05 (0.05)	-0.01 (0.04)
Assets _p	0.00 (0.01)	0.00 (0.00)	0.01 (0.01)	0.00 (0.01)	0.00 (0.00)	0.00 ^{**} (0.00)	0.00 (0.00)	0.00 [*] (0.00)
dROA _p	-0.73 ^{***} (0.12)				-0.58 ^{***} (0.10)			
dNIM _p		-0.53 ^{***} (0.05)				-0.39 ^{***} (0.05)		
dCosts _p			-0.15 (0.10)	0.12 (0.08)			-0.01 (0.09)	0.19 [*] (0.11)
Population	-0.28 (0.26)	-0.09 (0.06)	-0.25 (0.16)	-0.26 (0.26)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
GDP	0.00 (0.01)	-0.00 (0.00)	0.01 (0.01)	0.01 (0.01)	-0.00 (0.00)	-0.00 (0.00)	0.01 (0.01)	-0.00 (0.00)
Growth	-0.01 (0.08)	-0.08 ^{***} (0.03)	-0.04 (0.07)	0.02 (0.08)	0.03 (0.06)	-0.08 ^{***} (0.03)	-0.02 (0.05)	0.06 (0.06)
Tax	0.04 (0.06)	-0.00 (0.03)	0.12 ^{**} (0.05)	0.05 (0.06)	-0.06 [*] (0.03)	0.01 (0.02)	0.04 ^{**} (0.02)	-0.07 ^{**} (0.03)
M3	0.01 (0.01)	0.01 (0.00)	-0.00 (0.01)	0.01 (0.01)	0.00 (0.01)	0.00 (0.00)	-0.02 ^{***} (0.00)	0.00 (0.01)
CR5	0.09 (0.06)	0.01 (0.02)	-0.01 (0.03)	0.09 (0.06)	0.00 (0.01)	0.00 (0.01)	-0.02 (0.02)	0.00 (0.01)
Crisis	-0.02 (0.02)	0.01 ^{**} (0.00)	0.01 (0.01)	-0.01 (0.02)	-0.00 (0.01)	0.01 ^{***} (0.00)	0.02 (0.01)	-0.00 (0.01)
Sregion					-0.01 (0.02)	0.00 (0.01)	0.01 (0.01)	-0.01 (0.01)
Slanguage					0.01 (0.01)	0.00 (0.00)	0.01 (0.00)	0.01 (0.01)
Slaw					0.01 (0.03)	-0.01 (0.01)	-0.01 (0.02)	0.01 (0.03)
Deconomy					0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
N	1533	1499	1523	1523	1533	1499	1523	1523
R ²	0.04	0.15	0.15	0.02	0.02	0.13	0.12	0.00
F-statistic	6.2 ^{***}	14.6 ^{***}	2.6 ^{***}	2.1 ^{**}				
Wald χ^2					136 ^{***}	417 ^{***}	105 ^{***}	82 ^{***}

Note: Variables are defined in Table 1. Variables x_S and x_P are for foreign bank subsidiaries or its parent banks, respectively. Robust standard errors are reported in parentheses and they are clustered by multinational banks. ***, ** and * correspond to 1%, 5%, and 10% level of significance respectively.

5.2. *Subsidiaries in developed and developing countries*

As the existing studies present mixed results due to the host country's economic development, the sample is partitioned into developed and developing economies. Splitting the sample enables us to address the question of whether the profitability of subsidiaries related to parent banks is different in economically diverse countries. The regression is estimated using fixed and random models and the results do not differ significantly from each other. Therefore, only the results for the random model are presented for the sake of brevity.

The results, in Table 4, confirm that different factors determine the performance of subsidiaries in developed and developing nations. In developing countries, the coefficient for loans is positive, whereas the coefficient for deposits is negative. As both coefficients are significant, the results show that in developing countries loan activity is important for profitability, whereas the reliance on acquired funds does not have a negative impact on the performance. Hence, the results document that, in emerging markets, subsidiaries' profitability is determined by loan activity, whereas financing is done interbank or through the internal market. Conversely, in developed countries, only the deposit coefficient is positive and significant. Consequently, the results confirm that in developed countries, funding is an important determinant in explaining foreign subsidiaries' performance, whereas loan activity may not be (DeYoung and Nolle, 1996).

The results, for both groups of countries, confirm that the high capitalization of the subsidiaries has a negative effect on their overhead costs relative to the parent bank. Moreover, in developing countries, the higher capitalization of the subsidiary is again related to increased net interest margins, whereas, in developed countries, the relationship is statistically insignificant. Moreover, only in developing countries does a low level of liquidity lead to lower overhead costs for the subsidiary relative to its parent bank, while in developed it is not significant. Once again, those differences may indicate the different impact of the source of funding on the performance of subsidiaries in both groups of countries.

The results verify the previous results showing that subsidiaries perform well when the parent bank is underperforming in the home market. As in the main regressions, the coefficients $dROA$ and $dNIM$ are negative and highly significant in all specifications, while the coefficient $dCosts$ remains insignificant.

Finally, the results document that the location-specific factors are more important for foreign subsidiary performance in developing countries than it is in developed countries.

In developing countries, with low levels of economic development and growth, the financial system is underdeveloped and financial crises positively affect the profitability of the subsidiaries. An explanation for these results is that foreign subsidiaries profit from underdevelopment, whereas they are less affected by economic turmoil in the host countries owing to the different structures of clients as compared to domestic banks. Moreover, it can be assumed that, as a result of economic uncertainty in the host countries, foreign subsidiaries may improve their bargain situation and hence their profitability as they are able to charge more from their customers for their services. Indeed, the coefficient *GDP* and *Growth* are negative, while the *Crisis* variable is positive and highly significant. Conversely, in developed countries, financial crises negatively affect the profitability of the foreign subsidiaries. These results may be associated with higher competition in the banking sector and thus the weaker position of many foreign subsidiaries in those countries.

Corporate taxes are also again negatively related to profitability, yet the coefficient is insignificant. On the other hand, the coefficient of tax is positive and significant when the difference in the net interest margin is used as the dependent variable. Hence, the impact of taxes seems to be important in both groups of countries in explaining subsidiaries' performance, yet its impact may differ, which would explain the results.

The results reveal that the distance between the home and host country is only important for the profitability of foreign subsidiaries in developing countries. In all of the regressions for developing countries, the coefficient region coefficient *Sregion* is positive and statistically significant. This means that the geographical proximity of the subsidiary to its parent bank determines its profitability as well as its net interest margins. Conversely, the coefficient *Deconomy* is negative and highly significant in all of the regressions. This means that subsidiaries are more profitable when they are in less developed countries than their parent banks are. These results are in line with the findings of Claessens and van Horen (2009), who also documented that the geographical proximity and economic distance determine foreign bank profitability in developing countries. In opposition to them, however, I do not find the language proximity to be important. However, I show that the legal similarities of countries have a negative impact on subsidiaries' overhead costs relative to the parent banks in developing countries.

Table 4
Foreign subsidiaries performance in developed and developing countries

Dependent variable	Developed countries			Emerging economies		
	(1) ROA	(2) NIM	(3) Cost	(4) ROA	(5) NIM	(6) Cost
Equity _s	0.16 (0.12)	0.05 (0.04)	0.37* (0.21)	0.01 (0.04)	0.06*** (0.02)	0.12*** (0.02)
Loans _s	-0.02 (0.03)	0.00 (0.02)	-0.01 (0.02)	0.02* (0.01)	0.02** (0.01)	-0.02 (0.02)
Deposits _s	0.04* (0.02)	-0.01 (0.02)	0.02 (0.03)	-0.01* (0.01)	-0.02** (0.01)	-0.00 (0.01)
Securities _s	-0.04 (0.03)	-0.01 (0.01)	0.00 (0.03)	0.01 (0.01)	-0.01 (0.02)	-0.03* (0.01)
Assets _s	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Equity _p	-0.05 (0.05)	-0.01 (0.01)	0.08*** (0.03)	0.02 (0.04)	-0.03 (0.03)	0.38** (0.17)
Loans _p	0.02 (0.02)	0.00 (0.01)	-0.02 (0.02)	-0.00 (0.01)	0.00 (0.01)	-0.00 (0.03)
Deposits _p	0.03 (0.03)	0.01 (0.01)	0.01 (0.03)	0.02 (0.01)	-0.01 (0.01)	-0.04 (0.03)
Securities _p	-0.04 (0.05)	-0.02 (0.02)	-0.04 (0.04)	0.01 (0.03)	-0.00 (0.02)	0.17*** (0.06)
Assets _p	0.00 (0.00)	0.00*** (0.00)	0.01* (0.00)	0.00* (0.00)	0.00 (0.00)	-0.00 (0.00)
dROA _p	-0.65*** (0.12)			-0.50*** (0.16)		
dNIM _p		-0.47*** (0.08)			-0.39*** (0.08)	
dCosts _p			-0.01 (0.12)			-0.20 (0.15)
Population	-0.01 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
GDP	0.01 (0.01)	0.01 (0.01)	-0.02 (0.02)	-0.00 (0.00)	-0.00* (0.00)	0.02*** (0.01)
Growth	0.09 (0.16)	0.01 (0.05)	-0.04 (0.07)	0.00 (0.06)	-0.09*** (0.03)	0.04 (0.09)
Tax	-0.03 (0.04)	0.06*** (0.02)	0.05 (0.04)	-0.04* (0.02)	-0.02 (0.02)	0.03 (0.03)
M3	-0.02 (0.01)	-0.00 (0.00)	-0.00 (0.01)	-0.01 (0.01)	-0.02* (0.01)	-0.04** (0.02)
CR5	-0.00 (0.02)	0.02 (0.02)	-0.01 (0.03)	0.00 (0.01)	-0.01 (0.01)	-0.03 (0.02)
Crisis	-0.01* (0.01)	-0.00 (0.00)	-0.01 (0.01)	-0.00 (0.01)	0.02*** (0.01)	0.05*** (0.02)
Sregion	-0.02 (0.02)	-0.01 (0.01)	0.01 (0.01)	0.04** (0.01)	0.02** (0.01)	0.01 (0.02)
Slanguage	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)

Slaw	0.02 (0.02)	-0.00 (0.00)	0.01 (0.01)	-0.00 (0.00)	0.00 (0.00)	0.01** (0.01)
Deconomy				-0.04** (0.02)	-0.05*** (0.01)	-0.07*** (0.03)
N	724	709	724	809	790	799
R ²	0.02	0.10	0.25	0.04	0.22	0.10
Wald χ^2	105***	247***	99***	80***	140***	178***

Note: Variables are defined in Table 1. Variables x_S and x_P are for foreign bank subsidiaries or its parent banks, respectively. Robust standard errors are reported in parentheses and they are clustered by multinational banks. ***, ** and * correspond to 1%, 5%, and 10% level of significance respectively.

5.3. Foreign bank performance and origins of the parent bank

A number of studies have shown that the origins of multinational banks may matter for the performance of their subsidiaries abroad. As an example, Berger et al. (2000) found that banks from the US were more efficient than domestic banks in three of five host nations, while this was not true for other multinational banks from developed countries. Sturm and Williams (2010) found that multinational banks from the United Kingdom outperform other foreign banks in Australia. Thus, those studies show that the origin of the parent banks may determine the performance of its subsidiaries abroad. As a result, the sample was divided accordingly. I followed Leveen and Praveen (1994), and distinguished three regions: North America (America), Western Europe (Europe), and East Asia and the Pacific (Asia).

The results presented in Table 5 confirm the assumptions and show that the origins of the parent bank may determine the performance of its subsidiaries abroad. Internal as well as parent bank factors were important for multinational banks from Asia, for instance. The results are presented in the first three columns, where the variables presenting the level of subsidiaries' loans and deposits are statistically significant. Although, the coefficient for loans entered the regression positively, for deposits, it is negative. At the same time, the coefficients for the parent banks of those subsidiaries have the opposite signs and are statistically significant, as well. Thus, the results document the existence of internal capital markets inside Asian multinational banks. In contrast to the main results, however, the profitability of Asian parent banks in the home markets does not have an impact on their subsidiaries abroad. On the other hand, the coefficient $dCost$ is negative and statistically significant. This means that the subsidiaries of Asian banks have lower overhead costs if the parent bank has lower costs than its peers in the home market.

By contrast, the results show that internal factors for bank are of lesser importance for subsidiaries owned by multinational banks from America and Europe. Among the internal factors, capitalization positively influences the profitability of the subsidiaries owned by European banks, whereas for subsidiaries of American banks, the coefficient is insignificant. Nevertheless, it has a negative impact on the overhead costs of subsidiaries owned by parent banks from both regions.

The parent bank effects seem to be less important for banks from America and Europe than for the Asian multinational banks. The results reveal that the level of parent bank deposits is significant and negative for American banks, while it is positive for European and Asian banks. Moreover, the results reveal that subsidiaries perform well when they are owned by relatively small American multinational banks, whereas the coefficient for parent bank size from other regions is negative yet insignificant. Similarly, the results show that the coefficients $dROA$ and $dNIM$ are negative and significant only for the subsidiaries owned by the European parent banks. For the subsidiaries of America and Asia multinational banks, the coefficients are negative but insignificant. Hence, the results documents that the internal bank as well as the parent bank effects differ among subsidiaries and are strongly determined by the origin of the parent bank. The observed difference explains why parent bank profit efficiency was found to be important for subsidiaries of Greek multinational banks, while the opposite was true for foreign subsidiaries operating in Australia.

The results also present large differences in the impact of location-specific variables on foreign subsidiary performance depending on whether it is owned by Asian, American and European multinational banks. The economic development of the host countries is important for the performance of subsidiaries owned by Asian and American multinational banks. By contrast, the results show that the performance of European subsidiaries measured by net interest margins is positively influenced by low economic growth and financial crisis in the host countries, while the last variable also determines the performance of the Asian banks' subsidiaries. At the same time, the results indicate that the subsidiaries of European multinational banks perform better in host countries with well-developed financial systems, whereas it is the opposite case for the subsidiaries owned by American banks. The level of development of the financial system has a negative effect on the cost efficiency of the subsidiaries of the American banks, whereas it is the opposite case for subsidiaries owned by Asian multinational banks. The performance of the banks' subsidiaries abroad is also determined by the tax level in the

host country but to a different extent. In the regressions for Asian banks' subsidiaries, the tax coefficient is negative, which implies that they are more profitable in countries with low corporate taxes. The coefficient is negative for the subsidiaries of American and European banks, but it is insignificant.

Lastly, the results also present that the distance factors between home and host countries have different effects on the profitability of the subsidiaries relative to the parent bank depending on its origin. Among the distance factors, only legal proximity was positive and significant for all of the subsidiaries regardless of the parent's origin, whereas the dependent variable was the difference in net interest margins. However, when *ROA* was used to measure the performance of the subsidiaries, the coefficient *Slaw* was positive and significant only for the subsidiaries owned by Asian multinational banks. The Asian- and American-owned subsidiaries were also performing better when they operated in regions that were different than the parent banks' home countries, whereas, for the European banks' subsidiaries, the coefficient *Sregion* was insignificant. By contrast, the language proximity between the host and home country only determined the performance of subsidiaries owned by European parent banks. The subsidiaries of European as well as Asian multinational banks performed better in host countries with lower levels of development than in the home country, whereas the coefficient *Deconomy* was insignificant for subsidiaries owned by American banks.

Table 5
Foreign subsidiaries performance dependent on the origins of the multinational banks

Dependent variable	East Asia and Pacific			North America			Western Europe		
	(1) ROA	(2) NIM	(3) Cost	(4) ROA	(5) NIM	(6) Cost	(7) ROA	(8) NIM	(9) Cost
Equity _s	0.00 (0.06)	0.06 (0.06)	0.02 (0.04)	0.09 (0.12)	0.03 (0.03)	0.13** (0.06)	0.06* (0.03)	0.04* (0.02)	0.27* (0.15)
Loans _s	0.06*** (0.02)	0.08*** (0.01)	0.04*** (0.00)	-0.10 (0.06)	-0.00 (0.02)	-0.06 (0.04)	0.00 (0.01)	0.01 (0.01)	-0.01 (0.02)
Deposits _s	-0.10** (0.04)	-0.03* (0.02)	0.03*** (0.01)	0.05 (0.05)	-0.02 (0.02)	-0.01 (0.04)	0.01 (0.01)	-0.01 (0.01)	0.01 (0.02)
Securities _s	0.03 (0.03)	0.03*** (0.01)	-0.01 (0.01)	-0.05 (0.06)	-0.03 (0.02)	-0.06 (0.04)	-0.02 (0.02)	-0.01 (0.01)	-0.01 (0.02)
Assets _s	-0.00 (0.01)	-0.00 (0.00)	-0.01*** (0.00)	0.01 (0.01)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Equity _p	-0.01 (0.21)	0.23 (0.16)	0.09 (0.11)	0.88 (0.74)	0.58 (0.70)	0.40 (1.13)	-0.03 (0.03)	-0.01 (0.01)	0.07 (0.06)
Loans _p	-0.00 (0.08)	-0.04 (0.07)	-0.14*** (0.05)	-0.07 (0.34)	0.05 (0.07)	-0.02 (0.23)	-0.02 (0.01)	0.00 (0.01)	-0.04* (0.02)
Deposits _p	0.10** (0.05)	0.10*** (0.03)	0.07*** (0.02)	-0.72** (0.33)	-0.15 (0.20)	-0.27 (0.21)	0.02* (0.01)	0.00 (0.01)	-0.03 (0.02)
Securities _p	-0.05 (0.13)	-0.13* (0.07)	-0.21*** (0.06)	-0.42 (0.69)	-0.01 (0.11)	-0.00 (0.26)	0.01 (0.02)	-0.00 (0.01)	0.09 (0.07)
Assets _p	-0.00 (0.01)	-0.00 (0.00)	0.01*** (0.00)	-0.08** (0.03)	-0.01 (0.03)	-0.03 (0.05)	-0.00 (0.00)	0.00 (0.00)	-0.01 (0.00)
dROA _p	-0.46 (0.36)			-2.10 (1.99)			-0.62*** (0.11)		
dNIM _p		-0.37 (0.31)			-1.11 (0.73)			-0.52*** (0.07)	
dCosts _p			-0.10***			-0.91			0.07

			(0.02)			(0.98)		(0.16)	
Population	0.00	0.00	-0.01***	-0.01	0.00	-0.01	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
GDP	0.01	0.01	0.01	0.03*	0.00	0.01	0.00	-0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
Growth	0.06	-0.13	-0.13*	0.21	-0.06	-0.08	0.05	-0.08*	0.03
	(0.12)	(0.08)	(0.05)	(0.23)	(0.05)	(0.19)	(0.06)	(0.03)	(0.06)
Tax	-0.13**	-0.06**	0.06	-0.17	0.06	-0.07	-0.03	-0.02	0.03
	(0.06)	(0.03)	(0.05)	(0.12)	(0.05)	(0.06)	(0.02)	(0.02)	(0.02)
M3	0.01	0.01	-0.03***	-0.13*	-0.03*	-0.07**	0.01**	0.00	-0.01
	(0.02)	(0.01)	(0.01)	(0.08)	(0.02)	(0.03)	(0.00)	(0.00)	(0.01)
CR5	-0.03	0.00	-0.02	-0.00	0.05	0.05	0.01	-0.00	-0.04*
	(0.04)	(0.02)	(0.01)	(0.04)	(0.04)	(0.05)	(0.01)	(0.01)	(0.02)
Crisis	0.01	0.01**	0.00	-0.03	-0.00	-0.01	-0.00	0.01**	0.03
	(0.01)	(0.00)	(0.00)	(0.03)	(0.01)	(0.02)	(0.00)	(0.00)	(0.02)
Sregion	-0.05*	-0.04***	0.02	-0.14*	-0.06**	-0.07	-0.00	0.00	0.02
	(0.03)	(0.01)	(0.01)	(0.08)	(0.02)	(0.05)	(0.01)	(0.00)	(0.01)
Slanguage	-0.00	0.00	-0.00	-0.00	-0.00	0.01	0.00*	0.00	0.00
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Slaw	0.05***	0.02**	-0.00	0.11*	-0.00	0.01	0.00	0.01**	0.01
	(0.02)	(0.01)	(0.01)	(0.06)	(0.02)	(0.04)	(0.00)	(0.00)	(0.00)
Deconomy	-0.10***	-0.11***	-0.03	0.06	0.02	0.06	-0.01*	-0.01	-0.02
	(0.03)	(0.02)	(0.02)	(0.05)	(0.03)	(0.05)	(0.01)	(0.01)	(0.02)
N	103	103	103	295	295	295	1024	990	1014
R ²	0.25	0.34	0.28	0.02	0.10	0.06	0.15	0.15	0.19
Wald χ^2	90***	56***	86***	124***	52***	92***	142***	364***	113***

Note: Variables are defined in Table 1. Variables x_S and x_P are for foreign bank subsidiaries or its parent banks, respectively. Robust standard errors are reported in parentheses and they are clustered by multinational banks. ***, **, and * correspond to 1%, 5%, and 10% level of significance respectively.

5.4. Winners and losers among foreign subsidiaries

Another approach for studying the performance of foreign bank subsidiaries is to estimate the probability of being the best and worst subsidiary relative to the parent bank. To do this, discrete variables for best and worst performance were constructed. A bank was qualified as best (worst) subsidiary performer when it was in the highest (lowest) quartile based on *ROA*, *NIM* or *Cost*. Then, a logit with fixed and random effects was employed, which allowed us to estimate the probability of subsidiaries' performance abroad. In the regression, the dependent variable is one if a foreign subsidiary is the best (worst) performer and zero otherwise, while its probability is explained by the same set of covariates as in the main regression.

Table 6 reports the parameter estimates for the probability of subsidiaries' performance abroad, which are in general in line with the previous findings. Among the internal banks' factors, the coefficients for capitalization, loans and assets enter the mode for best and worst performing foreign bank subsidiaries as significant but with opposite signs. The variables for capitalization and loans are positive when determinants for best performing subsidiaries are estimated. Yet, the variable loan is only significant when the difference in the net interest margin is used as the dependent variable. At the same time, the high capitalization of the subsidiaries has a negative impact on its overhead cost, while size has the opposite effect. In contrast, the regression for worst performing

subsidiaries reveals that a low volume of credit has a negative impact on its profitability, but the results also show that it reduces the overhead costs.

The results confirm the main findings and document the fact that subsidiaries are performing better (worse) abroad when the parent bank is underperforming (overperforming) in the home market. In the best performing subsidiary regression, the loan coefficient for parent banks is negative and significant. By contrast, in the regression for the worst performing subsidiary, the capitalization for the parent bank, its loans as well as the deposit coefficient, are positive and significant. Hence, the results indicate that the parent banks allocate their assets to the best performing markets.

Again, in line with the main results, the regression reveals that foreign subsidiaries are performing better when the parent bank is from a more developed market than the host country is. Moreover, the results show that subsidiaries perform better in large countries with highly developed financial systems. On the other hand, the results confirm that subsidiaries generate higher net interest margins in countries with less developed financial systems and in periods of financial crisis. Moreover, foreign subsidiaries perform better (worse) in countries with high concentrations, which has a positive (negative) impact on cost efficiency.

Finally, the results verify that the host country's corporate tax level has an important impact on the profitability of foreign subsidiaries. The best performing subsidiaries report high overhead costs in countries with high taxes. There is only weak evidence showing that the geographical, legal or cultural distance between the host and home market has a significant impact on the performance of the subsidiary abroad.

Table 6
Best and worst performing foreign subsidiaries relative to its parent bank

Dependent variable	Best performing subsidiaries			Worst performing subsidiaries		
	(1) ROA	(2) NIM	(3) Cost	(4) ROA	(5) NIM	(6) Cost
Equity _s	5.26 ^{***} (1.09)	3.79 ^{***} (1.27)	11.15 ^{***} (1.85)	1.50 (1.27)	-3.03 [*] (1.60)	-8.90 ^{***} (2.35)
Loans _s	0.89 (0.60)	1.40 ^{**} (0.71)	-0.69 (0.81)	-2.30 ^{***} (0.85)	-5.00 ^{***} (0.97)	-2.81 ^{***} (1.07)
Deposits _s	0.03 (0.62)	-1.22 [*] (0.70)	0.33 (0.84)	-0.45 (0.80)	-0.22 (0.90)	-1.68 (1.15)
Securities _s	0.48 (0.73)	-0.29 (0.89)	-0.55 (1.04)	-0.92 (1.01)	0.20 (0.99)	2.95 ^{**} (1.40)
Assets _s	-0.26 ^{***} (0.08)	-0.14 (0.10)	-0.67 ^{***} (0.13)	-0.20 [*] (0.11)	-0.05 (0.13)	0.17 (0.17)
Equity _p	-2.23 (2.66)	0.09 (2.80)	7.75 ^{***} (2.87)	9.03 ^{***} (2.35)	10.59 ^{***} (3.65)	-6.56 (4.29)

Loans _p	-1.96** (0.99)	-0.04 (1.13)	-1.99 (1.54)	-0.91 (1.19)	2.95* (1.51)	7.29*** (2.42)
Deposits _p	1.75 (1.16)	0.31 (1.25)	1.61 (1.61)	3.09* (1.70)	-0.17 (1.76)	2.28 (2.17)
Securities _p	-1.71 (1.57)	0.48 (1.66)	2.03 (2.31)	-1.23 (1.91)	1.68 (2.22)	-1.35 (2.75)
Assets _p	0.17 (0.15)	0.23 (0.17)	0.20 (0.22)	-0.34* (0.20)	-0.72*** (0.22)	0.50 (0.31)
dROA _p	-51.34*** (10.81)			46.13*** (11.45)		
dNIM _p		-46.53*** (9.60)			51.72*** (11.79)	
dCosts _p			6.89 (8.02)			-73.64*** (14.84)
Population	0.27** (0.13)	0.13 (0.17)	0.16 (0.22)	-0.11 (0.18)	-0.08 (0.22)	-0.84*** (0.30)
GDP	-0.29 (0.23)	-0.19 (0.26)	0.43 (0.35)	-0.72** (0.33)	-0.21 (0.37)	-0.54 (0.52)
Growth	-2.51 (3.27)	-3.73 (3.26)	1.49 (3.86)	2.72 (3.90)	8.27* (4.54)	5.31 (6.68)
Tax	-2.40 (1.94)	1.65 (2.29)	7.82*** (2.93)	7.40*** (2.84)	-3.52 (3.05)	-3.80 (3.77)
M3	0.67** (0.33)	-2.33*** (0.84)	-2.40*** (0.83)	-1.23** (0.57)	0.09 (0.53)	0.74 (0.67)
CR5	0.92 (0.76)	0.50 (0.91)	2.18* (1.11)	1.63 (1.09)	1.48 (1.18)	-4.83*** (1.57)
Crisis	0.12 (0.37)	1.14*** (0.39)	0.63 (0.44)	0.41 (0.51)	0.47 (0.51)	0.10 (0.60)
Sregion	0.38 (0.49)	-0.08 (0.62)	0.87 (0.79)	0.06 (0.62)	-2.14*** (0.72)	0.74 (1.04)
Slanguage	0.10 (0.22)	-0.18 (0.24)	0.48* (0.28)	0.06 (0.32)	0.50 (0.32)	-0.24 (0.37)
Slaw	-0.06 (0.34)	-0.04 (0.43)	0.69 (0.56)	-0.09 (0.46)	-0.08 (0.56)	-0.35 (0.80)
Deconomy	-1.25* (0.70)	-1.69** (0.86)	-0.56 (1.11)	1.95** (0.93)	3.47*** (1.11)	5.95*** (1.62)
N	1571	1507	1530	1571	1507	1530
Log likelihood	-689	-578	-489	-358	-382	-358
AIC	1426	1204	1026	765	811	765
BIC	1554	1332	1154	893	939	893
χ^2	103***	85***	106***	83***	86***	97***

Note: Variables are defined in Table 1. Variables x_S and x_P are for foreign bank subsidiaries or its parent banks, respectively. Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance respectively.

Lastly, I ensured that all of the findings are robust by subjecting them to additional tests using alternative econometric methods, changing the specifications and exogenous variables, or altering the sample data. The main results of this study remained unaffected throughout all of these robustness checks, but are not shown for brevity.

6. Conclusions

When multinational banks expand abroad, they allocate resources and capital to their subsidiaries in the host country. Consequently, it should be expected that those subsidiaries perform equally or even better than their parent banks do in the home market. However, in the literature, little is known on how foreign subsidiaries perform relative to their parent banks and what drives the outcome. Understanding this relationship seems to be especially relevant as this study documents that foreign subsidiaries are on average less profitable than their parent banks are, which puts in question the rationality of rapid expansion, which has been observed in many markets in the last few decades.

On the other hand, the results also show that the difference in profitability can be attributed to the higher overhead costs of foreign subsidiaries in comparison to their parent banks. One of the explanations for the results can be that multinational banks use expenses in the first place to transfer income from host markets. The assumption is strengthened by the fact that in the regressions the tax variable is positive and statistically significant, which signals the use of tax arbitrage by multinational banks. It could mean that results are strongly influenced by transfer pricing. Buckley (2004) documented that multinational firms are avoiding taxes and transferring cash around the world by such devices as manipulating transfer prices, management fees, service charges, royalty payments and non-commercial interest payments. Henceforth, the profitability of the subsidiaries might be higher if it would not be distorted by the transfer pricing.

However, another explanation could be that the subsidiaries' overhead costs are higher abroad due to the existing distance to the parent bank and the lack of expertise in the host market. Yet, this explanation seems less likely as the regression shows that distance is only significant for profitability when emerging countries are used as the subsample. Moreover, as foreign subsidiaries are often newer entities than their parent banks are, we would rather expect that they have lower overhead costs as an effect of the better employment of the newest technology. Consequently, the transfer of income by the multinational banks using overhead costs seems to be the most apparent explanation for the results, yet more detailed studies are needed on this subject.

The study also documents that foreign subsidiaries perform better than their parent banks when the latter is inefficient in terms of profitability in the home market. These findings suggest that foreign subsidiaries are especially profitable for less competitive multinational banks, which may increase their overall results through foreign entry. This

could also mean that the home efficiency may not always be transferable, yet the results vary across multinational banks and seem to be relevant mainly for European, and to some extent, Asian multinational banks.

While this study has tried to address the issue of whether foreign subsidiaries perform better than their parent banks, it does not address an equally interesting question: Why do multinational banking organizations continue to enter new markets when their subsidiaries underperform abroad? There are a number of possible explanations. First, multinational banks may transfer income from the host country, which points to the results of this study. However, to establish these transfer and whether they can bias the results deeper knowledge on the existing relationship between the multinational bank and its foreign subsidiary is needed. Consequently, the existing results may be biased and foreign subsidiaries' profitability can be much higher than previously expected. Second, multinational banks may follow their customers abroad to better service their needs and to retain them (Grosse and Goldberg, 1991). In this case, it is the overall profitability of the relationship with that customer that is relevant, not merely the marginal contribution to profits made by the foreign subsidiary's bank. Third, multinational banking organizations may enter foreign markets to obtain benefits from international diversification (Buch et al., 2010).

All of these possible arguments are likely, but more studies are needed to understand the ongoing existing relationship between the multinational bank and its foreign subsidiary fully in terms of profitability, which is left for further research.

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