

Does the apple fall far from the tree? Banks' performance in emerging markets¹

Abstract

In this paper the performance drivers for subsidiaries and their parents are analysed in order to find out how both groups of banks are similar in this respect. We cover in our study about 2,900 bank-year observations for subsidiaries from 32 emerging markets and about 900 bank-year observations for 49 parent companies operating internationally. We conclude that in the case of cost control capital adequacy and asset quality their importance is similar for subsidiaries and their parents and they are strictly coordinated, while the remaining determinants allow for more flexibility. We also find out that subsidiaries from the EU and the countries which were not vassalized by countries of their respective parent companies do not “fall far from the tree”, as subsidiaries from non-EU and previously vassalized countries. While the former phenomenon is regarded as a sign of stronger integration, the latter underlines striving for greater economic independence.

Keywords: performance, foreign-owned banks, emerging markets

1. Introduction

The phenomenon called “parent-subsidiary nexus” has been analysed since mid-1990s. Houston et al. (1997) and Houston and James (1998) noted that an “internal capital market” operates between the parent company and its subsidiaries. Peek and Rosengren (1997, 2000) pointed out the existence of the transmission of shocks from parent companies to their subsidiaries. However, foreign bank subsidiaries are influenced not only by parent policies, but also, to some extent, by idiosyncrasy. Therefore, an interesting research question arises – to what extent subsidiaries resemble their parents. Such similarities can be analysed through different lenses, e.g. performance or business model. Due to the fact that we analyse subsidiaries operating in emerging markets (20 European transitioning, excluding Russia, 8 Latin American and 4 Asian countries), the focus on performance should provide interesting results because significant differences may be observed between home (i.e. countries of foreign investors) and host (i.e. countries in which subsidiaries operate) countries. This is

¹ The opinions expressed herein are those of the authors and do not reflect those of the associated institutions.

motivated by observations of existing “push effect” (e.g. Jeanneau and Micu 2002), which encourages banks to expand abroad to attractive regions.

According to most of the extant literature, the profitability of foreign-owned and domestic-owned banks has been compared (e.g., Dahl et al. 2008 from convergence perspective; Chen and Liao 2011 with joint home and host country effects) or of foreign-owned banks, for both developed and emerging markets (e.g., Claessens et al. 2001), indicating that subsidiaries in developed countries were less profitable. Some studies have explored the profitability of foreign-owned banks in emerging markets from the perspective of the market entrance strategy (e.g., Havrylczuk and Jurzyk 2011b) or the take-over strategy (Havrylczuk and Jurzyk 2011a). A cross-country study by Dietrich and Wanzenried (2014) presents determinants of profitability in low-, middle-, and high-income countries, concluding they vary among countries with different income levels. There are also single-country studies which focus on the impact of the parent company on the performance of subsidiaries (e.g., Kosmidou et al. 2007 for Greece) or the factors determining foreign-owned banks’ performance (e.g. To and Tripe 2002 for New Zealand, Sturm and Williams 2008 for Australia).

We focus on emerging markets with an intention to expand the stream of research presented by Chen and Liao (2011) and Dietrich and Wanzenried (2014). The goal of our study is to analyse how similar the performance drivers of subsidiaries and their parent companies are, accounting for long-term relations between host and home countries and geographical location of the countries of subsidiaries. To the best of our knowledge, such an analysis has not been conducted so far. This expands the literature on foreign-owned banks in emerging

markets and the determinants of their performance. We control for a number of macroeconomic and institutional factors, as well as for the heterogeneity of countries.

This paper is organized as follows. In the second section, we present a review of relevant literature. The third section explains the data sources and methodology, while in the fourth, we present and discuss the empirical results. The final, fifth section comprises concluding remarks.

2. Literature review

The review begins with wide cross-country studies by Chen and Liao (2011) and Dietrich and Wanzenried (2014). Then, we refer to the remaining, extant literature. Since Chen and Liao (2011) and Tan (2016) provided an in-depth review of previous studies on bank profitability, therefore our review of literature is selective.

In their study Chen and Liao (2011) analyse banks from 70 countries over the period from 1992 to 2006 to investigate joint home and host country effects impacting the banks' performance, accounting for bank ownership. The authors used three dependent variables, namely ROA, ROE and NIM. Among regressors there are bank-level and macroeconomic characteristics, measures of the banking market structure, and governance between the home and host countries. Their findings suggest that in most countries, foreign-owned banks were more profitable than domestic-owned ones if they operated in a less competitive environment and when the parent bank in the home country was highly profitable. The cross-country differences impacted foreign-owned banks' profitability and under certain conditions (e.g. less competitive banking sector, lower GDP growth rates, higher interest and inflation rates in the host country) allowed for higher profitability and stimulated regulatory arbitrage.

Dietrich and Wanzenried (2014) conducted an analysis of the determinants of banks' profitability (ROE – return on equity, ROA – return on assets and NIM – net interest margin) over the period of 1998 through 2012, for more than 10,000 banks from a large group of 118 countries. The countries were divided into three groups, based on the criterion of their income (low, middle and high). This analysis reveals that the level of income affects the significance of the determinants of bank profitability. Banks in high-income countries are found to be less profitable than those in lower income economies, and disparities in competition are one of the main discriminating factors behind these disparities. In low-income countries, privately owned banks demonstrated more profitability than state-owned ones. Macroeconomic factors were proved to explain a large degree of the profitability of banks from low-income countries. In our study, countries represent the low- and middle-income groups.

Moreover, Beltratti and Paladino (2015) searched the link between bank leverage and profitability (measured by residual income) on a sample of international banks over 2005-2011. It was found that there was a positive impact of bank equity capital on the level of residual income in a short run, underlying the role of bank capital in bank's strategy.

Studies by Saona (2016) and Djalilov and Piesse (2016) are dedicated to groups of emerging markets. The study by Saona (2016) is focused on profitability (measured by NIM) determinants in 7 Latin American countries over 1995-2012. Similarly to previous studies, the author took into account the impact of internal (i.e. bank-specific) and external (i.e. industry and macroeconomic) factors. Saona (2016) claimed that among bank-specific factors, asset diversification improved performance, while income diversification decreased this parameter. Among external factors, there was a negative impact of the efficiency of the regulatory system and the reduction of abnormal profits when financial system improves. Djalilov and Piesse (2016) conducted an analysis of 16 early and late (mostly former Soviet Union) transitioning

European countries, modelling ROA. They identified differences in performance determinants between early and late transitioning countries. One of their conclusions underlined that better capitalised banks are more profitable and the impact of credit risk is positive in the early transitioning countries.

Athanasoglou et al. (2008) presented a single country study modelling ROA and ROE for Greek banks representing different ownership. The timeframe of their analysis spanned from 1985 through 2001. They concluded that profitability was shaped by bank-specific (e.g. bank capital, exposure to credit risk) and macroeconomic determinants (e.g. inflation), while industry-specific determinants and bank ownership were not important. Another single country study is based on Swiss banks (Dietrich and Wanzenried 2011) and covered the period from 1999 through 2009, including separate models for pre-crisis and crisis periods. Banks' profitability was explained by operational efficiency (C/I ratio), growth of total loans, funding costs, the business model and bank ownership (e.g. co-owned by state or city, foreign-owned). Bank profits were also confirmed to be pro-cyclical. A single country study on an emerging market country, China, was delivered by Tan (2016). Chinese banks were analysed over 2003-2011, with a conclusion that these banks' profitability was determined by taxation rate (tax to operating profit before tax), overhead costs to total assets, productivity of labour force (gross revenue to number of employees) and the rate of inflation, while there was no robust evidence as for the role of risk and competition. A different perspective in a single country study on determinants of bank profitability was demonstrated by Ahamed (2017). The author analysed Indian banks for 1998-2014, drawing attention to the income diversification and its importance for profits (ROA) and risk-adjusted profits (ROA divided by standard deviation of ROA). It was concluded that banks moving from interest income to non-interest income generated higher profits, however, the risk-adjusted profit was higher only for

foreign-owned banks. This finding underlines better risk-management practices of foreign-owned banks.

To summarize, the research on the determinants of banks' performance was focused either on large international (or regional) samples or single countries. The conclusions on determinants were not unanimous and underlined discrepancies among countries. Hitherto the similarities in performance drivers between subsidiaries and their parent companies have not been analysed. Therefore, to the best of our knowledge, this is the first study to fill in this gap.

3. Data and Methodology

Following the previous studies, we select a set of macro- and microeconomic variables as potential regressors (Table 1). We model three performance indicators: bank's return on equity (ROE), return on assets (ROA) and net interest margin (NIM). Such a set of performance measures was used by Chen and Liao (2011), Dietrich and Wanzenried (2011, 2014) and Tan (2016).

Table 1. Regressors

Notation	Definition	Examples of use	Expected sign
MACROECONOMIC AND MARKET STRUCTURE VARIABLES:			
GDP	Change of GDP in real terms	Claessens et al. (2001), Havrylchyk and Jurzyk (2011b); Claey's and Vander Vennet (2008); Beltratti and Paladino (2015); Albertazzi and Gambacorta (2009); Dietrich and Wanzenried (2011); Dietrich and Wanzenried (2014); Tan (2016); Saona (2016); Djalilov and Piesse (2016)	+
INF	Inflation rate (CPI)	Chen and Liao (2011); Claessens et al. (2001); Claey's and Vander Vennet (2008); Athanasoglou et al. (2008); Beltratti and Paladino (2015); Albertazzi and Gambacorta (2009); Dietrich and Wanzenried (2014); Tan (2016); Saona (2016); Djalilov and Piesse (2016)	+
CR5	Concentration ratio; the share of five biggest banks in total assets of the banking sector in a country	CR3 - Claey's and Vander Vennet (2008); Dietrich and Wanzenried (2014); Tan (2016); Saona (2016); CR4 - Chen and Liao (2011); CR5 - Kosmidou et al. 2007, Beltratti and Paladino (2015)	+
BANK-LEVEL VARIABLES:			
S_LOANS	ln of Loans to total assets (TA)	Maudos and Guevarra (2004); Claey's and Vander Vennet (2008); Tan (2016); Saona (2016)	+
D_L	Deposits of customers to loans to customers	Similar to Chen and Liao (2011)	-

CAP	ln of Equity capital to total assets	Claessens et al. (2001); Claey's and Vander Vennet (2008); Cull and Martinez-Peria (2013); Havrylchyk and Jurzyk (2011b); Athanasoglou et al. (2008); Maudos and Guevarra (2004); Dietrich and Wanzenried (2011); Mostak Ahamed (2017); Dietrich and Wanzenried (2014); Tan (2016); Djalilov and Piesse (2016)	-
CRED_GROWTH	Credit growth (n/n-1) in real terms	Beltratti and Paladino (2015)	+
CI	ln of Cost to income ratio	Dietrich and Wanzenried (2011, 2014), Tan (2016)	-
LIQ_A	Liquid assets to deposits and short-term funding	Similar to: Chen and Liao (2011); Beltratti and Paladino (2015)	-
IMPAIR	Impairment charges ² to total assets	The substitute of NPL due to limited number of observations; proxy of credit risk; credit risk proxy - Chen and Liao (2011); LLP - Maudos and Guevarra (2004); Havrylchyk and Jurzyk (2011b); Athanasoglou et al. (2008); similar to Beltratti and Paladino (2015); Dietrich and Wanzenried (2011)	-
SIZE	ln TA (ln of TA in million EUR)	Athanasoglou et al. (2008); Chen and Liao (2011); Mostak Ahamed (2017); Dietrich and Wanzenried (2014); Tan (2016); Djalilov and Piesse (2016)	+/-

The bank-level data have been collected from Bankscope and supplemented by hand-collected data on the banks' owners, while the country-level data were extracted from the World Bank and IMF databases, as well as from central banks. Bankscope data have been supplemented by hand-collected data on bank ownership. The information has been obtained from the banks' annual statements and the shareholder information available on their websites. The sample period is 1995-2015. The sample covers 32 countries, including 20 European emerging markets (Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Ukraine) and 12 non-European countries (Argentina, Brazil, Chile, Colombia, India, Indonesia, Malaysia, Mexico, Panama, Peru, Philippines and Uruguay). We focused on these international banking groups that are active within and outside Europe. We selected 49 parent companies (see annex 1 for details). The selection of countries was based on foreign banks presence and its intensity, which is among the highest in transitioning Europe and Latin America.

² Impairment charges reflect, in profit and loss account, the cost of allowances (reserves) for non-performing loans and other impaired assets. These names are used under the framework of IAS 39.

As an important factor for similarities between parent companies and subsidiaries, we regard historical links as a potential determinant. Therefore, we introduced a dummy VASSAL, which indicates whether in the past a given host country was politically and/or military influenced by a given home country. In order to account for heterogeneity of countries, we divided host countries into two subsamples: EU and non-EU, including Latin American and Asian.

There are 3,078 complete bank-year observations for banks operating in emerging countries, which is limited to 2,878 after eliminating outliers and 849 bank-year observations for the parent companies of foreign-owned banks in that region, limited down to 803 after eliminating outliers. However, the number of observations used to estimate particular models differs³. Notably, in the case of some of the regressors, the natural logarithm of the variable is used. This is applied in the case when most of the distribution is concentrated in the <0;s> range, while some 20-30% is concentrated in the <s;100s> range. Clearly, even after eliminating the outliers, the tail of the distribution would prevail over its main part and the coefficient would be decided solely on a minor subset of observations. The use of logarithm flattens the distribution and eliminates this effect.

The bank-level data have been used to estimate a series of panel data regressions. We estimate

$$y_{it} = x'_{it}\beta + \alpha_i + \varepsilon_{it}, \quad (1)$$

where y_{it} , the dependent variable, is the bank's financial indicator (ROA, ROE or NIM) for the i -th bank in period t , x'_{it} is the vector of independent variables, β is the vector of parameters, α_i is the bank-level individual effect and ε_{it} is the error term.

³ The key reason why the number of observations is not constant across the models is the different set of regressors, some of which may be missing in the data set for certain banks. That is why we provide the number of observations effectively used to estimate each and every model.

We estimate (1) with the use of the fixed effects approach. There is natural rationale behind that choice. The approach requires the fewest assumptions (individual effects do not need to be uncorrelated with the regressors as it is, in brief, assumed in the random effects approach), but they do exist in the model, thus, the risk of omitted variable bias does not exist in the case of time invariant factors. In addition to that, to attain robustness of the results, we use the random effects estimator and additionally, estimate

$$y_{it} = x'_{it}\beta + \varepsilon_{it}, \quad (2)$$

with feasible GLS, in which we allow for the first order autocorrelation and cross-bank heteroscedasticity.

We estimated three models with different performance indicators: ROA (model 1), NIM (model 2) and ROE (model 3). Descriptive statistics are presented in annex 2.

4. Empirical Results and Discussion

In section 4.1. we present and discuss the results of all bank models, while in section 4.2. – the results of models which account for heterogeneity of countries. In the discussion, wherever we use the concept of significance of a variable, for brevity, we assume significance at the 10% level.

4.1. All bank model

In tables 2-4 we provide the results of estimations for all bank model. Model 1.1 (ROA, 1.1.a for subsidiaries and 1.1.b for parent banks) is treated as the baseline model and discussed in detail. Against this backdrop, we discuss the results of the models with two other dependent variables. As a robustness check, we provide models with random effects (1.2.a and 1.2.b; 2.2.a and 2.2.b; 3.2.a and 3.2.b) and with GLS estimations (1.3.a and 1.3.b; 2.3.a and 2.3.b; 3.3.a and 3.3.b).

The profitability of subsidiaries was influenced positively by the inflation rate, bank capital adequacy and liquid assets, while negatively – by the banking sector concentration, cost-to-income ratio and impairment charges. The impact of these variables is robust and in line with expectations. The positive role of the inflation rate is to be explained by high nominal interest rates allowing for higher profits through the net interest income. One may notice that in the environment of low interest rates, like today, banks generate lower profits due to lower margins. However, in emerging markets, also the credit risk increases the margins. The impact of bank capital adequacy confirms the positive role of bank capital ratios for profitability. It should be emphasized, good capital adequacy allows decreasing the cost of funding, on the other hand, however, a low leverage reduces the capability to increase the return on capital. Similar interlinkages may be observed as regards the role of liquid assets. Satisfactory liquidity allows avoiding emergency costs of funding due to liquidity shortages. However, too high liquid assets may decrease banks' profitability. In the analysed sample, both determinants are at the optimal level, which may be the result of the parent bank policy optimising the balance sheet structure of subsidiaries. More concentrated banking sectors do not enable to increase profitability, which does not comply with expectations. Due to lower competition on the market, banks should be in a position to report stronger profitability figures. One may explain this impact by the fact that foreign-owned banks are one of the groups of the market players together with domestic-owned and state-owned banks. We argue that foreign-owned banks strive to increase their market shares and therefore, offer lower margins. The negative impact of the cost-to-income ratio and impairment charges is confirmed as expected.

In the case of two variables (i.e. the share of loans in the balance sheet total and the deposit-to-loan ratio) the baseline model does not confirm their statistical significance, however, it is

confirmed by two other models (1.2.a and 1.3.a). Both variables show a positive impact on ROA. The role of the bank size does not show a robust impact. This unambiguous result suggests these particular estimates should be construed with caution, thus, we have refrained from formulating definite statements in this case. The most probable reason for these differences is the presence of the fixed time constant effects in the baseline model. Given the persistence of the explained time series, in the baseline model it is attributed to the fixed bank effects, while in the case of other models, this results in spurious significance of some regressors as a consequence of omitted variable bias.

Table 2. ROA models for all banks

	Subsidiaries			Parents		
	Model 1.1.a (fixed)	Model 1.2.a (random)	Model 1.3.a (GLS)	Model 1.1.b (fixed)	Model 1.2.b (random)	Model 1.3.b (GLS)
GDP	-0.0190 (-0.26)	0.0168 (0.23)	0.00786 (0.79)	0.00737* (2.48)	0.00758** (2.74)	0.00330* (2.12)
INF	0.297* (2.01)	0.482*** (3.74)	0.0422* (2.18)	0.0600*** (4.29)	0.0445*** (5.62)	0.0534*** (7.99)
CR5	-0.911*** (-9.13)	-0.573*** (-7.46)	-0.0307* (-1.99)	-0.00299 (-0.66)	-0.00296 (-1.21)	-0.00181* (-2.84)
S_LOANS	0.0689 (1.82)	0.210** (9.13)	0.0965** (12.34)	0.00230 (0.98)	0.00123 (0.68)	-0.000225 (-0.25)
D_L	0.0173 (0.92)	0.0836*** (6.04)	0.0368** (8.91)	0.00352* (2.32)	0.00143 (1.21)	0.00122* (2.35)
CAP	0.139* (5.73)	0.197** (10.81)	0.0447** (8.82)	0.00656*** (6.40)	0.00689** (8.03)	0.00535*** (13.73)
CRED_GROWTH	0.00871 (0.49)	0.0133 (0.78)	-0.000383 (-0.11)	0.00873*** (6.77)	0.00949** (7.69)	0.00569*** (8.56)
CI	-0.267*** (-9.31)	-0.127*** (-6.51)	-0.0146*** (-2.75)	-0.0159*** (-9.33)	-0.0156*** (-11.22)	-0.0132*** (-19.61)
LIQ_A	0.00304* (2.87)	0.00261* (2.92)	0.0151*** (13.73)	0.00301 (1.26)	0.00583** (2.77)	0.00105 (1.19)
IMPAIR	-1.176* (-2.70)	-1.033* (-2.50)	-0.632*** (-8.51)	-0.450*** (-16.51)	-0.418*** (-16.69)	-0.467*** (-16.26)
SIZE	-0.0776*** (-5.95)	-0.0118 (-1.41)	0.00397* (2.44)	-0.00156* (-2.40)	-0.000209 (-0.71)	-0.000206 (-1.94)
_cons	1.582*** (14.29)	0.822*** (10.48)	0.103*** (5.67)	0.0337*** (4.34)	0.0195*** (5.15)	0.0168*** (10.17)
N	2878	2878	2837	803	803	790

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3. NIM models for all banks

	Subsidiaries			Parents		
	Model 2.1.a (fixed)	Model 2.2.a (random)	Model 2.3.a (GLS)	Model 2.1.b (fixed)	Model 2.2.b (random)	Model 2.3.b (GLS)
GDP	0.126 (0.71)	0.171 (0.97)	0.0284 (1.21)	0.00171 (0.52)	0.00177 (0.50)	0.000908 (0.53)
INF	1.666*** (4.71)	1.953*** (5.84)	0.258*** (3.63)	0.0465** (2.98)	0.114*** (8.97)	0.0970*** (10.49)
CR5	-1.951*** (-8.05)	-1.640*** (-7.53)	-0.0595*** (-1.82)	-0.0119* (-2.38)	-0.00567 (-1.37)	-0.00503*** (-4.11)
S_LOANS	0.661*** (6.20)	0.752*** (10.98)	0.272*** (13.95)	0.00139 (0.58)	0.00195 (0.84)	0.00329** (2.65)
D_L	0.235*** (4.77)	0.269*** (7.07)	0.0984*** (9.68)	-0.00471*** (-2.93)	-0.00334* (-2.07)	0.00163 (2.00)
CAP	0.272*** (4.63)	0.346*** (6.88)	0.0770*** (7.57)	0.00508*** (4.46)	0.00757*** (6.37)	0.00918*** (14.76)
CRED_GROWTH	0.0748 (1.73)	0.0961* (2.26)	0.00615 (0.74)	-0.0000184 (-0.01)	0.00130 (0.83)	0.00359*** (5.06)
CI	-0.249*** (-3.56)	-0.0494 (-0.90)	0.0681*** (6.30)	-0.00716*** (-3.77)	-0.00683*** (-3.51)	-0.00530*** (-5.25)
LIQ_A	0.00578* (2.25)	0.00220 (0.94)	0.0360*** (14.18)	0.00280 (1.08)	0.00195 (0.71)	-0.00148 (-1.26)
IMPAIR	2.806*** (2.67)	3.487*** (3.39)	0.571*** (3.04)	-0.00335 (-0.11)	0.0905*** (2.76)	0.225*** (6.24)
SIZE	-0.140*** (-4.44)	-0.0646* (-2.50)	0.00698* (2.15)	-0.00470*** (-6.48)	-0.00413*** (-8.06)	-0.00221*** (-10.74)
_cons	3.014*** (11.12)	2.170*** (9.45)	0.243*** (7.10)	0.100*** (11.60)	0.0935*** (14.43)	0.0716*** (22.28)
N	2896	2896	2857	804	804	791

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. ROE models for all banks

	Subsidiaries			Parents		
	Model 3.1.a (fixed)	Model 3.2.a (random)	Model 3.3.a (GLS)	Model 3.1.b (fixed)	Model 3.2.b (random)	Model 3.3.b (GLS)
GDP	-0.801 (-1.19)	-0.0957 (-0.14)	0.0559 (0.76)	0.154* (3.16)	0.130* (2.99)	0.0748* (2.95)
INF	1.382 (1.01)	4.419*** (3.49)	0.363* (2.09)	0.329 (1.43)	0.273* (2.43)	0.391*** (4.65)
CR5	-6.197*** (-6.69)	-4.515*** (-5.75)	-0.202 (-1.67)	-0.115 (-1.56)	0.00879 (0.28)	0.00749 (0.69)
S_LOANS	-0.505 (-1.41)	2.559*** (11.05)	0.705*** (9.78)	0.0743 (1.93)	0.0541* (2.04)	0.0239 (1.45)
D_L	-0.154 (-0.88)	0.973*** (7.11)	0.285*** (8.16)	0.0744*** (3.00)	0.0421* (2.48)	0.0316*** (3.53)
CAP	-0.416 (-1.84)	0.521*** (2.85)	0.203*** (6.19)	0.0874*** (5.22)	0.0687*** (5.49)	0.0199*** (2.61)
CRED_GROWTH	0.0106 (0.06)	-0.0309 (-0.19)	0.00543 (0.23)	0.0796*** (3.78)	0.0960*** (4.92)	0.0611*** (6.06)
CI	-2.505*** (-9.39)	-0.386* (-1.98)	-0.170*** (-4.84)	-0.229*** (-8.21)	-0.201*** (-9.94)	-0.186*** (-19.58)
LIQ_A	0.00519 (0.52)	0.0254*** (2.87)	0.112*** (10.23)	0.0936* (2.39)	0.105*** (3.36)	0.0499*** (2.89)
IMPAIR	-12.65*** (-3.12)	-7.549 (-1.90)	-5.346*** (-11.37)	-5.228*** (-11.73)	-4.905*** (-12.83)	-5.129*** (-14.73)
SIZE	-0.633*** (-5.21)	-0.0313 (-0.35)	0.0383*** (2.96)	0.00743 (0.70)	0.0106*** (2.80)	0.00217 (1.59)
_cons	11.19*** (10.88)	4.433*** (5.47)	0.374*** (3.07)	0.153 (1.21)	0.0257 (0.51)	0.00393 (0.18)
N	2878	2878	2837	803	803	790

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

As for the model for parent banks (1.1.b), the statistical significance and the sign were confirmed for the rate of inflation, capital adequacy, cost-to-income ratio, impairment charges and deposit-to-loan ratio (with less robust results), but the profitability determinants embrace a broader scope. The GDP growth and the credit growth show a positive impact on the parent bank profitability, which is not the case for subsidiaries. Therefore, we suggest, parent banks are more influenced by macroeconomic environment and credit policy than their subsidiaries. The reasons for this are the following: the parent banks operate in a larger scale banking sectors (indicated by e.g. banking sector assets to GDP) at their home markets and are more prone to economic downturns. The credit portfolio is usually less important in the parents' balance sheets but its impact on profitability is more stable than the impact of other activities, such as trading and derivatives, as well as investment banking. Typically, subsidiaries in emerging markets, focus on deposit taking and loan granting and are characterised by low involvement in other types of activities.

For parent banks the results are not robust for the concentration ratio, liquid assets and size. Except for the size, we argue that these determinants are not crucial on mature markets for bank profitability. However, it again should be emphasized that the fixed effects (benchmark) estimates seem most trustworthy for three reasons. Firstly, the presence of fixed bank effects allows for the avoidance of omitted variable bias due to the omission of time constant variables. This is not the case with the other models. Secondly, individual effects are also present in the random effects approach, however, this requires an additional assumption regarding independence of the distribution of individual bank effects and the value of regressors. Thirdly, the number of parent banks is notable but not huge, which raises doubts regarding efficiency of the FGLS used in the random approach and thus, it may be concluded

that the fixed effects (benchmark) approach should be treated as the most realistic one in the case of discrepancies.

The NIM models (2.1.a for subsidiaries and 2.1.b for parents) confirm previous findings in the case of the role of inflation rate and capital adequacy. The conclusions are robust for the NIM model as for the positive impact of share of loans in total assets and deposit-to-loan ratio. The impact of impairment charges reveals a positive influence on NIM in comparison to the negative one for ROA. These differences as compared with the ROA model should be explained by: higher yields generated by the credit portfolio versus other types of assets (e.g. T-bill or T-bonds), the positive role of customer funding versus other types of funding on margins and the adequate credit risk pricing policy. In banks focused on traditional activities, potentially the highest yields are to be achieved on the credit portfolio. Customer funding is found to be more stable (as reflected, among others, in Basel III net stable funding ratio) and potentially cheaper than other sources of funding. The adequate pricing policy consists in setting a higher price when the credit risk is higher. Achieving higher NIM because of higher cost of risk is the result of adequate pricing policy.

Against this background, in parent banks determinants of NIM differences exist, however, the robust impact of the inflation rate and the capital adequacy has been confirmed. Moreover, the market concentration, cost-to-income ratio and size show a negative impact while for subsidiaries the results are not so robust. This may be explained by the differences in the market's maturity. On the other hand, the impact is not so certain in the case of funding and impairment charges. One could point out the following reasons for such differences. Parent banks represent different balance sheet structures that are less focused on credit activities and deposits from customers. A lower role of deposit funding may have an impact on the need to

hold liquid assets. Due to a lower share of loans, the significance of impairment charges has been reduced.

Overall, the identified differences may be explained by similar factors as discussed in the case of previous models.

As regards the ROE models, the differences between subsidiaries and their parents are the most evident. For subsidiaries, the only variable with fully robust impact is the cost-to-income ratio, while for parent banks, it is the GDP growth and bank-level variables, except for the share of loans in the total assets and size. In our judgement, this reflects the complexity of business determinants between both groups of banks, operating in different countries. Moreover, the cost-to-income ratio is one of several manageable variables that may be almost fully under management control. A strict cost control policy is one of the tools for parents to achieve the desired level of ROE.

4.2. Heterogeneity of countries

In order to account for heterogeneity of countries, we introduced two criteria to divide countries. First, we take the EU membership to divide subsidiaries into the EU and non-EU countries (European and non-European). Due to the fact that most of the parent companies are headquartered in developed countries, we decided not to divide parent banks. Second, we introduce a VASSAL dummy, which shows whether home and host countries have strong historical links which may be referred to as vassalage. This dummy is used for both subsidiaries and parent banks. To preserve consistency, we do not present tables, while the results are available on request.

There are differences between the EU and non-EU countries in the case of all profitability measures. In general, for non-EU subsidiaries fewer variables confirm their robust impact. We argue in these countries the determinants of profitability are less stable than in the EU host countries. We choose models for the EU countries as a benchmark in this case. Determinants of ROA for the EU subsidiaries are as follows: the rate of inflation, capital adequacy, credit growth (all with a positive impact), cost-to-income ratio, impairment charges and size (all with a negative impact). For the non-EU countries three variables show a robust impact with the same sign as for the EU countries, i.e. capital adequacy, cost-to-income and impairment charges. Banks in the non-EU countries are more concentrated on these ratios that must be probably crucial to their strategy and development. In the case of NIM there are more differences. For the EU subsidiaries four determinants show a robust positive impact (GDP growth, inflation rate, capital adequacy and credit growth rate), while two – a robust negative impact (cost-to-income and size). For non-EU subsidiaries, a similar impact has been confirmed only for the inflation rate and capital adequacy. However, two other variables are statistically significant, i.e., share of loans in the balance sheet total and the funding. This difference underlines probably a more traditional approach to banking activities than in the EU countries. In the case of ROE, even more differences may be spotted. For the EU subsidiaries, a wide range of variables determines the ROE level. These are the GDP growth, inflation rate, share of loans and funding (with a positive impact), cost-to-income and impairment charges (with a negative influence). At the same time, for the non-EU subsidiaries none of the variables confirmed a fully robust impact. This may be treated as a sign ROE management being less predictable in the non-EU countries.

In the case of historical links, we first comment on similarities and differences between vassal and non-vassal subsidiaries, then, on differences between subsidiaries and parent banks. Due

to a larger number of observations, we choose the non-vassal models as the benchmark. For the non-vassal subsidiaries, the GDP growth and six bank-level variables (share of loans, capital adequacy, cost-to-income, liquid assets, impairment charges and size) show a consistent impact on ROA, with signs compliant with expectations and previous results. In the model for the vassal subsidiaries, a lower number of variables confirmed a robust impact. In both groups of banks, capital adequacy and cost-to-income represent the same pattern, which is the evidence of a rather uniform policy of the parent in capital and cost management. The most important difference consists in a negative sign for the GDP growth in the vassal countries. We speculate this shows that the subsidiaries in the vassal countries may implement different policies which are not in line with the economic cycle. In the NIM models for the non-vassal subsidiaries, a wide range of variables confirmed their significance in a robust manner. These are two macroeconomic variables (GDP growth and the inflation rate) and most of the bank-level determinants, excluding funding proxy, liquid assets and impairment charges. Against this background, for the vassal countries, a similar role of the determinants is observed for the rate of inflation, capital adequacy and credit growth. Moreover, for the vassal countries, one observes a robust impact of impairment charges and the concentration ratio. ROE represents a similar pattern as previous profitability measures. For three variables, a robust impact has not been confirmed, i.e. concentration ratio, capital adequacy and size. Only in the case of two variables, the same impact has been confirmed for the vassal countries (inflation rate and cost-to-income ratio). As for the GDP growth, in both groups of countries, we identified a robust impact, however, the signs are different (positive for non-vassal and negative for vassal subsidiaries).

While comparing similarities between the subsidiaries and their parent banks accounting for vassal status, for the non-vassal subsidiaries we observe that more determinants show a

similar impact. We speculate it is the sign of stronger management integration between the parent and the subsidiary. On the other hand, one can postulate, it is the result of historical links, because the business culture of home and host countries is, to a larger extent, similar to the one in the non-vassal status. Therefore, more integration and more control is needed when historical links do not exist. In the case of ROA, three variables play a similar role for the parents and subsidiaries for the non-vassal pair (capital adequacy, cost-to-income and impairment charges), while for the vassal pair, only the cost-to-income ratio. For NIM, the comparison reveals similar results (inflation, capital adequacy, cost-to-income and size for the non-vassal vs. capital adequacy and impairment charges for the vassal group). For ROE, the differences are between the vassal and non-vassal pairs are the most visible. For the non-vassal pairs, almost all bank-level variables reveal a similar impact, while for the vassal pair, this is the case for the cost-to-income ratio.

5. Final Remarks

In this paper we analysed whether subsidiaries and their parent banks represent differences in performance drivers. Our analysis spanned from 1995 through 2015 and covered a significant portion of foreign-owned banks, from emerging markets and their globally active parents.

Overall, the differences in performance drivers exists between parents and subsidiaries, but three bank-level characteristics represent a commonly consistent impact in various settings. These are the cost-to-income ratio, capital adequacy and impairment charges. We claim it shows reasonable managerial concentration on cost efficiency and bank safety, which is in focus of regulators and supervisors. Concentration on cost management is regarded as a typical tool for the improvement of performance, including especially crisis periods or any restructuring cases. Capital adequacy has for a long time been part of the regulators' agenda,

however, after the GFC more attention was given to deleveraging all around the world. Therefore, as we speculate, this factor is important for banks' performance. Impairment charges demonstrate the quality of assets and regardless of the business model of the bank, it plays an important role for banks' performance, especially, during periods of economic downturn. In the case of macroeconomics variables, only inflation was found statistically significant in various settings. From the practical point of view, it is also important. As a matter of fact, this factor differs significantly between emerging markets and developed countries. Other macroeconomic features do not show such considerable gaps and therefore, their role varies in various settings. These variables where "the apples do not fall far from the tree" play a crucial role in bank management. We interpret that the remaining part of variables allows for more managerial flexibility and therefore, is not so strictly coordinated between parents and subsidiaries. In this respect, "the apples may fall far from the tree" and flexibly adjust to the local conditions.

Moreover, we found that the subsidiaries operating in the EU countries more resemble their parents than the subsidiaries from other countries. This is the evidence of greater maturity of "new" EU markets than other emerging countries, and is a proof of strong integration within the EU. Rather surprisingly, the subsidiaries from the non-vassal countries are more similar to their parents than the subsidiaries from previously vassalized countries. We speculate the source of this difference is a higher pressure on independence from the vassals. This was the case, for instance, in post-communist EU countries.

Bibliography:

Ahamed M. (2017), Asset quality, non-interest income, and bank profitability: Evidence from Indian banks, *Economic Modelling*, Vol. 63: 1-14

- Athanasoglou, P., Brissimis, S., Delis M. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability, *Journal of International Financial Markets, Institutions and Money*, Vol. 18(2), 1, 21–136
- Beltratti, A., Paladino, G. (2015), Bank leverage and profitability: Evidence from a sample of international banks, *Review of Financial Economics*, vol. 27 (1): 1058-3300
- Chen, S. H., Liao, C. C. (2011). Are foreign banks more profitable than domestic banks? Home- and host-country effects of banking market structure, governance, and supervision. *Journal of Banking and Finance*, Vol. 35(4), 819–839.
- Claessens, S., Demirguc-Kunt, A., Huizinga, H.P. (2001). How does foreign entry affect domestic banking markets? *Journal of Banking and Finance*, Vol. 25(5), 891–911
- Dahl, D., Shrieves, R.E., Spivey, M.F., (2008). Convergence in the activities of European banks. *Journal of International Financial Markets, Institutions and Money*, Vol. 18(2), 161–175.
- Dietrich A., Wanzenried G. (2014), The determinants of commercial banking profitability in low-, middle-, and high-income countries, *The Quarterly Review of Economics and Finance*, vol. 54 (3): 337-354
- Djalilov K., Piesse J. (2016), Determinants of bank profitability in transition countries: What matters most?, *Research in International Business and Finance*, vol. 38: 69-82
- Havrylchyk, O., Jurzyk, E. (2011a). Inherited or earned? Performance of foreign banks in Central and Eastern Europe. *Journal of Banking and Finance*, Vol. 35(5), 1291–1302
- Havrylchyk, O., Jurzyk, E. (2011b). Profitability of foreign banks in Central and Eastern Europe, *Economics of Transition*, Vol. 19 (3), 443-472
- Houston, J., James, C. (1998). Do bank internal capital markets promote lending? *Journal of Banking and Finance*, Vol. 22(6-8), 899–918.
- Houston, J., James, C., Marcus, D. (1997). Capital market frictions and the role of internal capital markets in banking. *Journal of Financial Economics*, Vol.46(2), 135–164.
- Jeanneau, S. and Micu, M. (2002). ‘Determinants of international bank lending to emerging market countries’, Technical report, BIS Working Papers, Basel.
- Journal of International Financial Markets, Institutions and Money*, vol. 40: 85-110
- Kosmidou K., Pasiouras F., Tsaklanganos A. (2007). Domestic and multinational determinants of foreign bank profits: The case of Greek banks operating abroad, *Journal of Multinational Financial Management*, Vol. 17(1), 1-15
- Peek, J., Rosengren, E., (1997). The International Transmission of Financial Shocks: The Case of Japan, *The American Economic Review*, Vol. 87 (4), 495-505.
- Peek, J., Rosengren, E., (2000). Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States, *The American Economic Review*, Vol. 90 (1), 30-45.
- Saona P. (2016), Intra- and extra-bank determinants of Latin American Banks' profitability, *International Review of Economics & Finance*, vol. 45: 197-214
- Sturm J., Williams B. (2008). Characteristics determining the efficiency of foreign banks in Australia, *Journal of Banking and Finance*, Vol. 32 (11), 2346–2360
- Tan Y. (2016), The impacts of risk and competition on bank profitability in China,
- To, H.M., Tripe, D. (2002). Factors influencing the performance of foreign-owned banks in New Zealand, *Journal of International Financial Markets, Institutions and Money*, Vol. 12(3), 341-3

Annex 1. List of parent banks

No.	Parent bank	Home country	Subsidiaries outside Europe (Y/N)
1	Erste	AT	N
2	Hypo Alpe Adria	AT	N
3	Raiffeisen	AT	N
4	KBC	BE	N
5	Bank of China	CN	Y
6	Bank of Cyprus	CY	N
7	Home Credit	CZ	Y
8	Commerzbank	DE	Y
9	Deutsche	DE	Y
10	Procredit	DE	Y
11	Volkswagen	DE	Y
12	Danske	DK	N
13	Santander	ES	Y
14	Credit Agricole	FR	Y
15	Paribas	FR	Y
16	Societe	FR	Y
17	Alpha Bank	GR	N
18	Eurobank EFG	GR	N
19	National Bank of Greece	GR	N
20	Piraeus	GR	Y
21	OTP Bank	HU	N
22	Bank Leumi	IL	Y
23	Intesa	IT	N
24	Unicredit	IT	N
25	Veneto	IT	N
26	Bank of Tokyo	JP	Y
27	Toyota via Toyota Bank	JP	Y
28	ABN Amro	NL	Y
29	Credit Europe Bank	NL	N
30	ING	NL	Y
31	DNB	NO	Y
32	BCP	PT	N
33	AlfaBank	RU	N
34	Bank of Moscow	RU	N
35	First Czech	RU	N
36	SMP Bank	RU	N
37	Sberbank	RU	N
38	VTB Bank	RU	N
39	SEB	SE	N

40	Swedbank	SE	N
41	NLB	SI	N
42	Calik	TR	N
43	Garanti	TR	N
44	Halk	TR	N
45	Ziraat	TR	N
46	Pivdennyi	UA	N
47	Privatbank	UA	N
48	Citibank	US	Y
49	GE Capital	US	Y

Annex 2. Descriptive statistics

	Parent companies, n=803				Subsidiaries, n=2878			
	Mean	Std. deviation	Min value	Max value	Mean	Std. deviation	Min value	Max value
NIM	0,0270	0,0273	0,0012	0,2709	0,8520	2,2138	-4,5700	19,8900
ROE	0,0782	0,1351	-0,9832	0,4592	2,4339	6,7143	-3,2000	48,0700
ROA	0,0059	0,0105	-0,0605	0,0805	0,2412	0,6625	-0,2300	4,9400
GDP_GROWTH	0,0107	0,0858	-0,8923	0,3275	0,0242	0,0978	-0,4564	0,3435
INF	0,0272	0,0403	-0,0448	0,6487	0,0528	0,0645	-0,0142	0,6113
CR5	0,5190	0,2024	0,1668	1,0000	0,6313	0,1435	0,2406	1,0000
lnLoans_to_TA	-0,6626	0,3525	-2,4091	-0,0534	0,1728	1,6215	-2,5358	4,5446
D_L	0,8697	0,4004	0,0000	2,8005	1,0410	0,7741	0,0000	7,7826
lnEQ_to_TA	-2,8201	0,5238	-4,7560	-1,1783	-1,4428	1,7386	-4,0230	3,5343
CRED_GROWTH	0,0716	0,2061	-0,9149	1,4494	0,1568	0,4059	-0,9913	2,9879
lnCI	-0,5140	0,2540	-1,9951	0,1644	0,2883	1,6936	-2,2118	4,5929
Liquid_A_to_Funding	0,3305	0,2269	0,0161	1,4963	7,0105	17,8259	-0,0658	103,7800
IMPAIR	0,0066	0,0122	-0,0174	0,1586	0,0104	0,0179	-0,0652	0,2407
lnTA	11,4425	2,0046	5,3891	14,6100	6,9984	1,6662	1,9459	12,1795