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Article

Determinants of Bank M&As in Central and Eastern Europe

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Abstract: This paper analyzes the determinants of bank mergers and acquisitions (M&As) from a bank-level perspective. The main objective of the study is to identify those mutual characteristics of all banking institutions from Central and Eastern Europe that are prone to be acquired versus acquirer, or national versus cross-border. Using a database of more than 200 M&As transactions between 2000 and 2018 within Central and Eastern Europe, we document the main characteristics that influence the decision of merging, including the size of the bank, profitability, lending activities, liquidity, bank concentration, banking system stability, government effectiveness, regulatory quality, and the level of inflation. Higher effective average tax rate, which is associated with reduced tax avoidance, influences banks in a positive manner to be involved in the M&A process, findings that hold for targeted banks and domestic transactions. Furthermore, the analysis highlights the changes the financial crisis has projected on investors' behavior.

Keywords: bank; mergers and acquisition; financial crisis



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1. Introduction

Bank mergers and acquisitions (M&As) can be analyzed from several perspectives, the two most important being the ones related to (i) geography (national versus cross-border) and (ii) the role played in the transaction (target/acquired versus acquirer/buyer). Given these particularities, the next step would be to identify the way they relate to certain microeconomic and macroeconomic characteristics and to what extent the bank's profitability indicators, the structure, and size of the capital, or the level of market concentration and legal directions influence the inclusion in one of the two categories mentioned above. This narrative is the main objective of the study, the approach being one of a kind as the focus of the literature has always been on financial gains and M&As implications on the economy. We suggest a different perspective, the starting point being the institutional and national proxies and their effect on the merger decision. Taking this into account, we expect that larger banks and those with financial and operational struggles will have more chances to be part of a merger and acquisition as a target rather than acquirer. Furthermore, a growing economy with a structured but flexible legislative system will encourage the M&A market, especially cross-border transactions. On the other hand, national bank mergers and acquisitions will lead to a more powerful and efficient national banking system. Thus, we sketch the typology of the banks which sooner or later will be targeted or acquired, by proposing the following hypotheses:

Hypothesis 1 (H1). *Larger banks and those with financial and operational struggles will have more chances to be part of a merger and acquisition as a target rather than acquirer.*

Hypothesis 2 (H2). *A growing economy with a structured but flexible legislative system will encourage the M&A market, especially cross-border transactions.*

The importance of the paper relies on the M&As significance and their ability to capture the market dynamics.

Given the institutional and national particularities, within each state, there will be differences between the efficiency and the performance of domestic versus cross-border financial entities. Furthermore, the same foreign financial institution will have different objectives and strategies depending on the market they want to enter. Another relevant element would be the period of time, in the way that a medium to long-term analysis of at least 10 years would be required in order to capture the possible changes they may reflect over the economies. From this perspective, a 19-year window (2000–2018) will allow us to articulate the effects of the financial crisis on investors' decisions, identifying possible changes before and after a global financial crisis.

This study aims to capture the institutional and national factors with an impact on the restructuring operations like bank mergers and acquisitions. Moreover, it identifies the variables that weigh the most in the affiliation of an institution in one of the main categories: national versus cross-border and target versus acquirer. Another innovation element is represented by the region we are testing the hypothesis, Central and Eastern Europe (CEE) being a very popular market in the last years. If we look at the medium- and long-term impact bank mergers and acquisitions could have in less developed countries, the results will most probably be different than the developed ones. The same can happen if the methodology is differentiated by the type of financial institution: commercial, investment, or savings banks. The importance and relevance for the literature is given by the comprehensiveness at all levels of the study—database, methodology, results. We find that the main microeconomic, banking system, and macroeconomic characteristics that influence the decision of merging are the size of the bank, profitability, lending activities, liquidity, bank concentration, banking system stability, government effectiveness, regulatory quality, and the level of inflation.

The remainder of our paper is structured as follows: Section 2 summarizes the related literature review. Section 3 describes the data and methodology that were employed. Section 4 reports the empirical findings and Section 5 presents the concluding remarks.

2. Literature Review

The most important and common way of restructuring operations classification is the one regarding the geographical affiliation—national and cross-border. Banks focus on acquisitions and mergers involving a partner from another market for several reasons such as the level of European integration, the opportunities to automate and improve operations, gaining the role of a global player, regulatory framework or risks, and services diversifications. If we follow the results of Beck et al. (2004), cross-border M&As do not help financial development and implicitly economic growth, being only a form of gain for shareholders. However, country characteristics must also be considered as the national environment has a considerable influence on the success of the transaction.

Another very important step is the selection of the merging partner. This has been captured in the top biggest mistakes that occur before the transaction materializes along: hubris issues, the lack of a due diligence process, a gap in the strategy and a long-term plan, the price paid by the acquirer, or an accelerated transition. After a thorough analysis of the business feasibility, the board should have no problem rejecting the proposal if the financial institution to be acquired does not match the strategy, culture, and business plan. However, more than 20% of managers say they continued to complete the process even if they had doubts (Papadakis 2007). The peculiarities of the targeted bank weigh a lot, especially the portfolio of products and services, the quality of loans, the interest margin, or the capital component (Novickyte 2015). Banks with organizational or structural issues are often targeted, which through improved strategy and vision could perform and increase shareholder earnings in a relatively short time.

A study conducted in 2007 on 56 mergers and acquisitions, the targeted banks being from Central and Eastern Europe and those that initiated the transaction from Western

Europe or the US, aimed to identify the main drivers of the investors when entering an emerging market. Using an event study methodology, the authors show that there is a significant link between the acquiring bank and its market capitalization (Fritsch et al. 2007). Moreover, the study identifies the attributes of the targeted banks that led the investors towards them. In addition to the financial situation of the institutions, the characteristics of the country and the market, the level and quality of regulations, the economic freedom, and the low growth rate of the gross domestic product have been identified as very important. The more emerging the market in which the targeted banks operate are, the implications on the bidder will be more positive, creating value (Madura and Wiant 1994; Kiyamaz and Mukherjee 2000; Kiyamaz 2004). The Central and Eastern European market was seen as a way to expand and rapidly quantify the investment, especially after the end of the communist regime. The volume of bank mergers and acquisitions has increased since 1990, more than a third of those recorded in Europe in the last 15 years involving a CEE entity. From this perspective, a vast strand of literature has emerged in the area of banking performance and the implications of mergers and acquisitions (Bonin and Wachtel 1999; Berglöf and Pajuste 2003; Havrylchuk 2006; Popovici 2013).

Another equally important and interesting factor is that the bidding bank has a certain level of experience and exposure, the involvement in several restructuring operations significantly increasing the chances of a successful transaction. DeYoung (1997) and Zollo and Leshchinskii (2000) identify this positive correlation and the synergies created when the acquirer had a higher level of experience gained through previous M&As involvement. The level of exposure to the target market or holding shares or any other managerial influence is another determinant to be considered. This advantage acts from two perspectives—the access to the financial performance will allow the materialization of an accurate and valid offer while exercising a greater power of negotiation.

In addition to the above, the similarity and common elements of the banks involved in a merger or acquisition could be another factor that may influence the likelihood of M&As transactions. The literature has tried to quantify the extent to which this degree of similarity between partners helps the transaction's success, finding that in the case of domestic or national M&As these typologies are targeted due to the low associated cost with integration, while in the case of the cross-border M&As they attract gains and higher economic performance (Altunbaş and Marqués 2008). Nonetheless, the general conclusion has been that while restructuring operations at the level of entities with geographical features or common business lines tend to increase synergies, too many dissimilarities will negatively affect post-merger performance (Houston and Ryngaert 1994; Amihud et al. 2002). However, differences in the level of capitalization, investment, and openness to technology lead to financial development, supporting a sustainable process of bank consolidation as stimulates financial innovation and know-how.

3. Data and Methodology

3.1. Data

Our dataset consists of 217 mergers and acquisitions from 17 Central and Eastern European countries—Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovakia, Slovenia, and Ukraine. As we can note from Table 1, out of the 217 transactions, 51% have been domestic M&As (111 transactions) and 49% cross-border M&As (106 transactions). In order to have a consistent database, the entities are entirely commercial banks so that the impact on financial development and growth could be captured and studied in an accurate manner. Furthermore, the commercial segment is one of the strongest from any market, offering the possibility to extrapolate the results to the entire banking system. Excluding the extremes, the average is around 6%, each country being involved in more or less than 11 mergers or acquisitions during the 2000 to 2018 period. We can conclude that the database has been built in a homogeneous and balanced way, assuring sustainable results. Moreover, the 19 years will allow us to capture the effects of

the 2008 financial crisis, being able to quantify to what extent the investors' preferences in terms of M&As have changed.

Table 1. The distribution of the bank mergers and acquisitions by country.

Country	M&A	% from Total	Domestic M&As	Cross-Border M&As
Albania	8	4%	2	6
Bosnia and Herzegovina	10	5%	5	5
Bulgaria	11	5%	6	5
Croatia	15	7%	9	6
Czech Republic	12	6%	9	3
Estonia	3	1%	1	2
Hungary	10	5%	8	2
Latvia	8	4%	5	3
Lithuania	7	3%	6	1
North Macedonia	8	4%	3	5
Montenegro	4	2%	1	3
Poland	25	12%	14	11
Romania	20	9%	10	10
Republic of Serbia	18	8%	7	11
Slovakia	6	3%	2	4
Slovenia	14	6%	9	5
Ukraine	38	18%	14	24
Total	217	100%	111	106

Between 2000 and 2008, cross-border M&As have been predominant, articulating positive financial trends and the overall economic wellbeing. After the fall of Lehman Brothers, an event that is associated with the onset of the global financial crisis, the balance has switched to the national ones, becoming an instrument of survival and adaptation to the new environment. As per Table 2, 56% of all M&As have materialized before 2008, in the next 10 years only 44% of transactions were closed. The financial data have been collated from BankFocus and Zephyr platforms. The micro and macroeconomic indicators have been taken from different websites of international organizations such as the International Monetary Fund, the World Bank, or the Heritage Foundation. Thus, we ended up with 4788 bank-year observations.

3.2. Methodology

In order to identify the main bank-specific and macroeconomic characteristics that influence the affiliation of a financial institution to the four categories—target/acquirer and domestic/cross-border—a Logit estimation technique has been employed. In this way, the study quantifies the influence of the micro and macro variables over the five models conducted. As it can be seen in Table A1 from the Appendix A in addition to the 5 dummy variables that took values 0 or 1 depending on the category assessed, the model includes a series of bank-level indicators that are found in the literature to significantly influence M&As transactions, such as bank size (total assets), capitalization (equity/total assets), operational efficiency (cost to income ratio), profitability (return on average equity), lending activities (net loans/total assets), credit risk (impaired loans/gross loans), funding structure (customer deposits/total assets), and liquidity (interbank ratio and liquid assets/total deposits and borrowings). Furthermore, the model adds a number of banking system indicators (concentration and nonperforming loans/total gross loans) and macroeconomic indicators (government effectiveness, financial freedom, regulatory quality, inflation, and GDP per capita). In this way, a holistic analysis will be performed, including both the institutional and national particularities that influence the merging decision.

Table 2. The distribution of the bank mergers and acquisitions by year.

Year	M&A	% from Total	Domestic M&As	Cross-Border M&As
2000	19	9%	5	14
2001	8	4%	4	4
2002	12	6%	6	6
2003	9	4%	3	6
2004	8	4%	5	3
2005	9	4%	4	5
2006	23	11%	7	16
2007	19	9%	8	11
2008	15	7%	8	7
2009	9	4%	6	3
2010	8	4%	7	1
2011	10	5%	3	7
2012	14	6%	8	6
2013	15	7%	10	5
2014	15	7%	11	4
2015	12	6%	7	5
2016	8	4%	5	3
2017	2	1%	2	0
2018	2	1%	2	0
Total	217	100%	111	106

The probability that one of the 16 indicators significantly influences the financial institution’s affiliation to one of the five categories constructed as dummy-type variables (i.e., merged, target, acquired, domestic, cross-border) has been computed using a Logit model. The baseline model has the following form:

$$y_{ij} = \alpha_0 + \alpha_1 \times X_i + \alpha_2 \times Z_j + \varepsilon_{ij} \tag{1}$$

where y_{ij} is a dummy-type variable denoting a bank i from country j that falls in one of the five categories, i.e., merged, target, acquirer, domestic, or cross-border, X_i is a $k \times 1$ set of bank-specific explanatory variables (i.e., total assets, equity/total assets, cost to income ratio, return on average equity, net loans/total assets, impaired loans/gross loans, customer deposits/total assets, interbank ratio, and liquid assets/total deposits, and borrowings), Z_j is an $n \times 1$ vector of country-level control variables, both at the banking system (concentration and nonperforming loans/total gross loans) and macroeconomic level (government effectiveness, financial freedom, regulatory quality, inflation, and GDP per capita), and ε_{ij} is the disturbance term with a standard logistic distribution corresponding to the bank i from country j . The Logit estimation is selected as our benchmark model because of its interpretations in terms of the odds ratio. Additionally, Logit models have a probability distribution function that is easy to integrate which leads to a closed-form expression of the choice probability. However, the consensus is that both Logit and Probit techniques provide similar outputs. To correct for any form of heteroskedasticity, we use robust standard errors at the bank level.

The estimated probability that bank i from country j has been involved in a M&A transaction is computed as follows:

$$PI_{ij} = \frac{e^{\alpha_0 + \alpha_1 \times X_i + \alpha_2 \times Z_j}}{1 + e^{\alpha_0 + \alpha_1 \times X_i + \alpha_2 \times Z_j}} \tag{2}$$

4. Empirical Results

4.1. Descriptive Statistics

The literature has shown that in order for a bank to initiate or to be offered a partnership, it must meet a number of criteria regarding size, level of profitability, and liquidity.

These three proxies have been captured by a set of microeconomic variables. Table A1 from Appendix A exhibits a brief description of these variables, together with other banking system and macroeconomic indicators used as control variables, as well as their frequency and source, whereas Table A2 from Appendix B shows their descriptive statistics. To reduce the influence of outliers, we winsorize all variables between 1 and 99 percentiles.

4.2. Baseline Results

As per Table 3, the size of the bank, computed as a natural logarithm of its assets expressed in EUR, is a significant driver of bank M&As, larger banks thus having an increased probability of being involved in restructuring activity. More precisely, larger banks are 45.8% more prone to take part in an M&A transaction. Usually, financial institutions focus on acquisitions involving smaller and less complex entities, the implementation of which could be accomplished in a shorter time (Beitel et al. 2004). This particularity has been identified since 1990 when Hawawini and Itzhak (1990) observed a significant and positive link between such restructuring operations at the level of 579 banks in the US between 1977 and 1998. Moreover, Altunbaş and Marqués (2008) drew a series of features of the bidding bank—on average, its assets are seven times larger and have an intense operational efficiency. The bank that will be acquired has a significant volume of loans, the interest income being almost non-existent. Our findings confirm the hypothesis that cross-border mergers and acquisitions often involve a much more prepared and experienced institution, which can take greater risks. Nonetheless, it is important to note that a smaller bank will generally have a higher share of loans and insignificant capital level regardless of the possibility of an M&A manifestation. The research results are in line with the vast strand of literature, the size of the bank given by the total assets being a main pillar in all five models. On the loans side, the share of nonperforming loans on total gross loans (credit risk) did not turn out to be statistically significant. However, lending activities (net loans/total assets) negatively influence the materialization of a national merger and acquisition or the probability that it will be acquired, contradicting the results of Altunbaş and Marqués (2008). On the other side, the higher the share of customer deposits, as an indicator of funding structure, the more prone that a bank will be to initiate a restructuring operation.

The level of profitability and operational efficiency are two other important characteristics of the targeted banks. Akhavein et al. (1997) developed two theories, the efficiency hypothesis and the low-efficiency hypothesis, which argue that an entity that does not perform at normal parameters will automatically bring significant gains to the bidding institution after the merger materializes. The first of the two centers around the experience and know-how brought by the bidder bank, compared to the second view according to which the very materialization of the M&A will determine an increase of management motivation and cost-efficiency. The importance of the financial and operational situation of the target bank is also demonstrated by Pilloff (1996); Peek et al. (1999), and Berger et al. (2000). From the profitability point of view, only ROAE is significant for most models, the efficiency captured by cost to income ratio being significantly negative. This implies a direct and proportional relationship between the probability of being targeted and involved in a bidding process by an institution with foreign capital.

Lanine and Vander Vennet (2007); Hannan and Pilloff (2009); Hernando et al. (2009), and Pasiouras et al. (2011) have conducted various studies on a considerable sample of financial institutions highlighting the characteristics that matter the most in the selection process of the acquired entities, as follows: (i) At the European Union level, the institutions whose performance is more deteriorated (high costs) are more likely to be targeted, supporting the theory that financial synergies materialize much easier if one of the entities is underperforming. For the same reason, mergers and acquisitions of institutions with a more stable and strong level of capital and assets are less likely to be acquired. As per our empirical results, the better capitalized an institution is, the more will focus on cross-border operations. On the efficiency side, the conclusions showed that this is a factor considered only by the targeted parties. (ii) The institutions with a high deposit rate (stable funding

structure) or any high savings instrument are more likely to be involved in a restructuring process due to their financial stability. Such institutions can take higher risks and exercise medium to long-term strategies. Our results are in line with these, with the total customer deposits/total assets indicator being a significant factor for the probability that an institution will be involved in such a process, especially within a bidder position. (iii) Large financial institutions are much more attractive for both domestic and cross-border M&As. This finding confirms that targeting the complex entities helps in diversification of products and services, seizing new market segments, and supporting the authorities in creating national champions in the banking sector, confirming our first hypothesis. (iv) National or domestic mergers and acquisitions have been much more intense in the case of European Union new members, supporting the idea that the privatization process will enhance the M&A process. (v) In terms of the market concentration level, domestic M&As are less likely in highly concentrated environments. Cross-border ones have a much higher incidence, articulating the desire for visibility and representation on to the important markets. Our conclusions are conflicting, the higher the level of concentration the higher the possibility of belonging to one of the categories (see Table 4).

Table 3. Bank-level determinants of M&As.

Model	(1)	(2)	(3)	(4)	(5)
Variables	Merged	Target	Acquirer	Domestic	Cross-Border
Size	0.3774 *** (0.0377)	0.2443 *** (0.0333)	0.1235 *** (0.0383)	0.2177 *** (0.0362)	0.1579 *** (0.0340)
Equity/Total Assets	0.0004 (0.0079)	0.0001 (0.0082)	−0.0040 (0.0084)	−0.0437 *** (0.0144)	0.0301 *** (0.0088)
Cost to Income Ratio	−0.0018 (0.0018)	−0.0025 * (0.0014)	−0.0001 (0.0022)	−0.0001 (0.0018)	−0.0027 * (0.0014)
Return on Average Equity (ROAE)	−0.0054 *** (0.0019)	−0.0075 *** (0.0018)	0.0027 ** (0.0014)	−0.0008 (0.0014)	−0.0044 *** (0.0015)
Net Loans/Total Assets	−0.0110 *** (0.0036)	−0.0144 *** (0.0033)	0.0060 (0.0037)	−0.0144 *** (0.0039)	0.0021 (0.0032)
Impaired Loans/Gross Loans	0.0001 (0.0012)	−0.0010 (0.0014)	0.0012 (0.0014)	−0.0002 (0.0015)	0.0004 (0.0013)
Total Customer Deposits/Total Assets	0.5479 (0.3584)	−0.3206 (0.3441)	1.1924 *** (0.4195)	0.3362 (0.3764)	0.2956 (0.3431)
Interbank Ratio	−0.0007 ** (0.0003)	−0.0008 ** (0.0003)	0.0002 (0.0003)	0.0002 (0.0003)	−0.0009 *** (0.0003)
Liquid Assets/Tot Deposits and Borrowings	−0.0118 *** (0.0042)	−0.0071 ** (0.0036)	−0.0058 (0.0045)	−0.0119 *** (0.0045)	−0.0021 (0.0036)
Constant	−3.8646 *** (0.7190)	−2.2578 *** (0.6238)	−3.9808 *** (0.7582)	−2.4845 *** (0.7376)	−3.2786 *** (0.6374)
Observations	1929	1929	1929	1929	1929
Wald chi-squared test	0.0000	0.0000	0.0000	0.0000	0.0000
p-value					
AUROC	0.6933	0.6447	0.6023	0.6515	0.6068
Pseudo R-squared	0.0830	0.0465	0.0210	0.0504	0.0240
Estimation method	Logit	Logit	Logit	Logit	Logit

Note: This table presents the estimation results of Equation (1) using the Logit estimation technique. The variables are defined in Table A1 from Appendix A. Wald chi-squared test is the model test that assesses the validity of the overall model with the null hypothesis that the estimated coefficients are simultaneously equal to zero. AUROC is the Area Under Curve Receiver Operator Characteristic. Robust standard errors in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Table 4. Bank-level, banking system-level, and macroeconomic determinants of M&As.

Model	(1)	(2)	(3)	(4)	(5)
Variables	Merged	Target	Acquirer	Domestic	Cross-Border
Size	0.4756 *** (0.0430)	0.2813 *** (0.0388)	0.1828 *** (0.0448)	0.1567 *** (0.0411)	0.3428 *** (0.0438)
Equity/Total Assets	−0.0114 (0.0083)	−0.0138 * (0.0079)	−0.0019 (0.0092)	−0.0364 *** (0.0135)	0.0193 ** (0.0079)
Cost to Income Ratio	−0.0019 (0.0018)	−0.0031 ** (0.0015)	0.0008 (0.0020)	−0.0002 (0.0018)	−0.0020 (0.0014)
Return on Average Equity (ROAE)	−0.0069 *** (0.0022)	−0.0085 *** (0.0020)	0.0027 * (0.0014)	−0.0008 (0.0016)	−0.0053 *** (0.0014)
Net Loans/Total Assets	−0.0136 *** (0.0038)	−0.0140 *** (0.0034)	0.0039 (0.0042)	−0.0158 *** (0.0040)	0.0022 (0.0033)
Impaired Loans/Gross Loans	0.0032 ** (0.0014)	0.0000 (0.0015)	0.0038 ** (0.0015)	0.0031 * (0.0016)	0.0004 (0.0016)
Total Customer Deposits/Total asset	0.7489 ** (0.3688)	−0.1290 (0.3628)	1.3072 *** (0.4585)	0.6366 (0.4015)	0.3421 (0.3714)
Interbank Ratio	−0.0009 *** (0.0003)	−0.0008 *** (0.0003)	0.0000 (0.0003)	0.0003 (0.0003)	−0.0012 *** (0.0003)
Liquid Assets/Total Deposits and Borrowings	−0.0171 *** (0.0045)	−0.0058 (0.0038)	−0.0149 *** (0.0054)	−0.0185 *** (0.0050)	−0.0024 (0.0039)
Bank Concentration	0.0131 *** (0.0026)	0.0035 (0.0024)	0.0115 *** (0.0029)	0.0111 *** (0.0026)	0.0030 (0.0027)
Nonperforming Loans/Total Gross Loans	−0.0346 *** (0.0107)	−0.0386 *** (0.0106)	0.0112 (0.0111)	−0.0005 (0.0107)	−0.0348 *** (0.0111)
Government Effectiveness	−0.1450 (0.2065)	0.3271 (0.2175)	−0.5836 ** (0.2286)	0.4805 ** (0.2300)	−0.7010 *** (0.2308)
Financial Freedom	0.0051 * (0.0027)	0.0004 (0.0022)	0.0048 * (0.0025)	−0.0086 *** (0.0024)	0.0142 *** (0.0023)
Regulatory Quality	−0.6539 *** (0.2508)	−0.9136 *** (0.2458)	0.4045 (0.2545)	0.4635 * (0.2404)	−1.1446 *** (0.2704)
Inflation	0.1034 *** (0.0229)	0.0501 ** (0.0199)	0.0506 *** (0.0179)	0.0603 *** (0.0183)	0.0461 ** (0.0222)
GDP per Capita	−0.1222 (0.1255)	−0.0262 (0.1209)	−0.0447 (0.1476)	0.0843 (0.1441)	−0.1004 (0.1214)
Constant	−4.2948 *** (1.2261)	−2.2578** (1.1286)	−5.2405 *** (1.5195)	−3.2058** (1.4467)	−4.8153 *** (1.1293)
Observations	1929	1929	1929	1929	1929
Wald chi-squared test	0.0000	0.0000	0.0000	0.0000	0.0000
<i>p</i> -value					
AUROC	0.7249	0.6796	0.6732	0.7195	0.7003
Pseudo R-squared	0.1156	0.0688	0.0602	0.1054	0.0868
Estimation method	Logit	Logit	Logit	Logit	Logit

Note: This table presents the estimation results of Equation (1) using the Logit estimation technique. The variables are defined in Table A1 from Appendix A. Wald chi-squared test is the model test that assesses the validity of the overall model with the null hypothesis that the estimated coefficients are simultaneously equal to zero. AUCROC is the Area Under Curve Receiver Operator Characteristic. Robust standard errors in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

The analysis of banking system and macroeconomic factors concluded on the fundamental influence of all of them in the decision of merging. However, the difference is highlighted by the level of influence in the way that the more efficiently a country is being governed, with a defined regulatory framework but has a high share of nonperforming loans, the investors will think twice. This is due to the low possibilities of delivering economies of scale, this objective being one of the main determinants of the orientation

towards an emerging market. The level of financial freedom and bank consolidation will positively influence the chances of an M&A.

For a financial institution to be in a bidder position, it must be profitable, have a funding structure focused on deposits and other saving products, a size that allows it financial stability and sufficient funds channeled to investments and not the last a high level of liquidity. The share of impaired loans turned out to have a positive impact, possibly being the reason why that bank has been open to a restructuring operation in the first place. From the banking system and macroeconomic aspects, the degree of financial freedom, bank concentration, and the level of inflation enhance the probability of an M&A. The weaker the banking system, the dynamics of the M&A market will decrease. A bank will have more chances to be acquired if from an operational and financial point of view it shows a deterioration of the indicators, the conclusion being in line with the results of the literature (Lanine and Vander Vennet 2007; Hannan and Pilloff 2009; Hernando et al. 2009; Pasiouras et al. 2011). At the banking system- and macroeconomic-level, the efficiency of the regulatory framework and the share of nonperforming loans are negative and statistically significant, meaning that the financial institutions choose to partner with poorly regulated but high-performing regions.

The domestic versus cross-border analysis highlights the investors' impulse to base their national restructuring strategy on weakly capitalized banks (equity/total assets), with liquidity issues (liquid assets/total deposits and borrowings), and with low lending activities captured by net loans/total assets. On the other side, the banks looking to expand into other markets will be well-capitalized but will have performance and liquidity problems. The results are also confirmed by the domestic indicators that come up as significant and negative like the government efficiency and regulatory framework. The level of inflation, financial freedom, and less stable banking systems will enhance the mergers and acquisition market.

4.3. Robustness Checks

To test the robustness of our findings, we employ two additional estimation techniques: Ordinary least squares (OLS) (Table 5) and Probit (Table 6).

The results maintain their robustness both in terms of significance and magnitude, confirming our previous findings.¹ Furthermore, we re-estimate Equation (1) by controlling for corporate tax avoidance. Thus, we investigate what factors drive M&A behavior conditional on the effective average tax rate (EATR) which is used in the literature as a proxy for tax avoidance (see e.g., Shams et al. 2021). EATR is computed using the Devereux–Griffith methodology (Devereux and Griffith 2003). Corporate income taxation makes funding through debt issuance more attractive, because interest on debt is tax-deductible in most countries, whereas a return on equity is not (Bremus et al. 2020). Arulampalam et al. (2019) argue that a higher tax rate in a country could enhance, reduce, or not affect the probability that its corporations are the subject of a cross-border acquisition.

The estimated results are exhibited in Table 7. We can note higher effective average tax rates, which are associated with reduced tax avoidance practices, influence banks in a positive manner to be involved in an M&A process, findings that hold for targeted banks and domestic transactions. A possible explanation could lie in the fact that taxes on future profits of the existing corporation should already be capitalized into its value to existing shareholders and the acquirer might be able to increase its revenue stream and offset higher taxation through different practices, such as improved efficiency, greater knowledge or simply use of a brand name (Arulampalam et al. 2019). Thomsen and Watrin (2018) document that tax avoidance in European Union firms has, on average, decreased over time. We also document that corporate taxation does not explain cross-border mergers and acquisitions, results that are in line with those of Emter et al. (2019) on cross-border banking developments.

Table 5. Robustness assessment using the OLS estimation method.

Model	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Merged	Target	Acquirer	Domestic	Cross-Border
Size	0.0950 *** (0.0078)	0.0637 *** (0.0082)	0.0313 *** (0.0076)	0.0281 *** (0.0079)	0.0670 *** (0.0081)
Equity/Total Assets	−0.0020 (0.0016)	−0.0024 (0.0015)	0.0004 (0.0012)	−0.0048 *** (0.0016)	0.0029 ** (0.0013)
Cost to Income Ratio	−0.0003 (0.0003)	−0.0004 * (0.0003)	0.0002 (0.0003)	0.0000 (0.0003)	−0.0003 (0.0002)
Return on Average Equity (ROAE)	−0.0011 *** (0.0003)	−0.0015 *** (0.0003)	0.0004 ** (0.0002)	−0.0001 (0.0003)	−0.0010 *** (0.0002)
Net Loans/Total Assets	−0.0026 *** (0.0008)	−0.0030 *** (0.0007)	0.0004 (0.0007)	−0.0030 *** (0.0007)	0.0004 (0.0007)
Impaired Loans/Gross Loans	0.0006 ** (0.0003)	−0.0000 (0.0003)	0.0006 ** (0.0003)	0.0005 * (0.0003)	0.0001 (0.0003)
Total Customer Deposits/Total Assets	0.1408 * (0.0752)	−0.0360 (0.0803)	0.1768 *** (0.0639)	0.0889 (0.0716)	0.0519 (0.0734)
Interbank Ratio	−0.0002 *** (0.0001)	−0.0002 *** (0.0001)	−0.0000 (0.0001)	0.0000 (0.0001)	−0.0002 *** (0.0001)
Liquid Assets/Tot Deposits and Borrowings	−0.0035 *** (0.0009)	−0.0013 (0.0008)	−0.0021 *** (0.0008)	−0.0032 *** (0.0009)	−0.0002 (0.0007)
Bank Concentration	0.0026 *** (0.0005)	0.0007 (0.0005)	0.0019 *** (0.0005)	0.0020 *** (0.0005)	0.0006 (0.0005)
Nonperforming Loans/Total Gross Loans	−0.0065 *** (0.0021)	−0.0083 *** (0.0023)	0.0018 (0.0021)	0.0004 (0.0022)	−0.0069 *** (0.0021)
Government Effectiveness	−0.0260 (0.0392)	0.0771 (0.0486)	−0.1031 ** (0.0434)	0.1228 *** (0.0448)	−0.1487 *** (0.0476)
Financial Freedom	0.0009 * (0.0005)	0.0000 (0.0005)	0.0009 ** (0.0004)	−0.0017 *** (0.0005)	0.0026 *** (0.0004)
Regulatory Quality	−0.1245 *** (0.0476)	−0.2022 *** (0.0542)	0.0777 * (0.0468)	0.0965 * (0.0499)	−0.2210 *** (0.0505)
Inflation	0.0184 *** (0.0034)	0.0107 ** (0.0043)	0.0077 ** (0.0036)	0.0098 *** (0.0037)	0.0087 ** (0.0043)
GDP per Capita	−0.0256 (0.0250)	−0.0084 (0.0267)	−0.0172 (0.0213)	−0.0081 (0.0232)	−0.0175 (0.0248)
Constant	−0.3473 (0.2381)	−0.0226 (0.2458)	−0.3247 (0.2218)	0.1105 (0.2282)	−0.4579 ** (0.2310)
Observations	1929	1929	1929	1929	1929
R-squared	0.1399	0.0877	0.0610	0.1189	0.1037
Estimation method	OLS	OLS	OLS	OLS	OLS

Note: This table presents the estimation results of Equation (1) using the OLS estimation technique. The variables are defined in Table A1 from Appendix A. Wald chi-squared test is the model test that assesses the validity of the overall model with the null hypothesis that the estimated coefficients are simultaneously equal to zero. AUCROC is the Area Under Curve Receiver Operator Characteristic. Robust standard errors in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Table 6. Robustness assessment using the Probit estimation method.

Model	(1)	(2)	(3)	(4)	(5)
Variables	Merged	Target	Acquirer	Domestic	Cross-Border
Size	0.2857 *** (0.0253)	0.1717 *** (0.0237)	0.1124 *** (0.0259)	0.0938 *** (0.0247)	0.1996 *** (0.0259)
Equity/Total Assets	−0.0062 (0.0050)	−0.0087 * (0.0048)	0.0017 (0.0052)	−0.0192 *** (0.0065)	0.0109 ** (0.0048)
Cost to Income Ratio	−0.0008 (0.0011)	−0.0017 * (0.0009)	0.0010 (0.0011)	0.0003 (0.0011)	−0.0012 (0.0008)
Return on Average Equity (ROAE)	−0.0038 *** (0.0012)	−0.0050 *** (0.0012)	0.0019 ** (0.0009)	−0.0004 (0.0009)	−0.0033 *** (0.0008)
Net Loans/Total Assets	−0.0080 *** (0.0022)	−0.0087 *** (0.0021)	0.0015 (0.0024)	−0.0100 *** (0.0022)	0.0015 (0.0020)
Impaired Loans/Gross Loans	0.0018 ** (0.0008)	0.0001 (0.0009)	0.0023 *** (0.0009)	0.0018 ** (0.0009)	0.0004 (0.0009)
Total Customer Deposits/Total Assets	0.4223 * (0.2192)	−0.0714 (0.2163)	0.6929 *** (0.2522)	0.3503 (0.2316)	0.1900 (0.2212)
Interbank Ratio	−0.0005 *** (0.0002)	−0.0005 *** (0.0002)	0.0000 (0.0002)	0.0001 (0.0002)	−0.0007 *** (0.0002)
Liquid Assets/Tot Deposits and Borrowings	−0.0095 *** (0.0027)	−0.0038 (0.0023)	−0.0079 ** (0.0031)	−0.0103 *** (0.0029)	−0.0017 (0.0023)
Bank Concentration	0.0079 *** (0.0015)	0.0021 (0.0015)	0.0067 *** (0.0016)	0.0066 *** (0.0015)	0.0018 (0.0016)
Nonperforming Loans/Total Gross Loans	−0.0203 *** (0.0064)	−0.0232 *** (0.0064)	0.0062 (0.0065)	−0.0003 (0.0064)	−0.0229 *** (0.0066)
Government Effectiveness	−0.0701 (0.1261)	0.1958 (0.1308)	−0.3591 *** (0.1341)	0.2740 ** (0.1350)	−0.4584 *** (0.1353)
Financial Freedom	0.0033 ** (0.0015)	0.0002 (0.0014)	0.0027 * (0.0015)	−0.0052 *** (0.0015)	0.0087 *** (0.0014)
Regulatory Quality	−0.4260 *** (0.1488)	−0.5500 *** (0.1480)	0.2523 * (0.1500)	0.2849 ** (0.1452)	−0.6623 *** (0.1563)
Inflation	0.0585 *** (0.0132)	0.0306 *** (0.0115)	0.0279 ** (0.0108)	0.0338 *** (0.0110)	0.0256 ** (0.0124)
GDP per Capita	−0.0631 (0.0746)	−0.0174 (0.0729)	−0.0212 (0.0815)	0.0607 (0.0808)	−0.0440 (0.0727)
Constant	−2.7174 *** (0.7280)	−1.3734 ** (0.6839)	−3.2010 *** (0.8301)	−2.0230 ** (0.8070)	−2.9492 *** (0.6866)
Observations	1929	1929	1929	1929	1929
Wald chi-squared test	0.0000	0.0000	0.0000	0.0000	0.0000
<i>p</i> -value					
AUROC	0.7440	0.6791	0.6711	0.7176	0.6998
Pseudo R-squared	0.1137	0.0686	0.0597	0.1048	0.0867
Method of estimation	Probit	Probit	Probit	Probit	Probit

Note: This table presents the estimation results of Equation (1) using the Probit estimation technique. The variables are defined in Table A1 from Appendix A. Wald chi-squared test is the model test that assesses the validity of the overall model with the null hypothesis that the estimated coefficients are simultaneously equal to zero. AUCROC is the Area Under Curve Receiver Operator Characteristic. Robust standard errors in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Table 7. Robustness assessment by controlling for corporate tax avoidance.

Model	(1)	(2)	(3)	(4)	(5)
Variables	Merged	Target	Acquirer	Domestic	Cross-Border
Size	0.5420 *** (0.0523)	0.2506 *** (0.0466)	0.2428 *** (0.0490)	0.1888 *** (0.0445)	0.3402 *** (0.0536)
Equity/Total Assets	−0.0328 *** (0.0126)	−0.0123 (0.0111)	−0.0364 ** (0.0163)	−0.0617 *** (0.0151)	0.0219 ** (0.0107)
Cost to Income Ratio	−0.0041 ** (0.0017)	−0.0060 ** (0.0024)	0.0011 (0.0019)	−0.0001 (0.0017)	−0.0046 ** (0.0020)
Return on Average Equity (ROAE)	−0.0087 ** (0.0041)	−0.0097 *** (0.0032)	0.0027 (0.0022)	−0.0008 (0.0023)	−0.0050 *** (0.0017)
Net Loans/Total Assets	−0.0098 * (0.0050)	−0.0169 *** (0.0040)	0.0127 *** (0.0047)	−0.0096 ** (0.0040)	0.0030 (0.0040)
Impaired Loans/Gross Loans	0.0035 * (0.0018)	−0.0001 (0.0021)	0.0041 ** (0.0019)	0.0048 *** (0.0018)	−0.0028 (0.0026)
Total Customer Deposits/Total Assets	0.7071 (0.4808)	−0.3721 (0.4462)	1.5524 *** (0.5006)	0.9203 ** (0.4259)	−0.1148 (0.4452)
Interbank Ratio	−0.0010 *** (0.0004)	−0.0011 *** (0.0004)	0.0003 (0.0004)	0.0003 (0.0004)	−0.0017 *** (0.0005)
Liquid Assets/Tot Deposits and Borrowings	−0.0151 *** (0.0053)	−0.0028 (0.0043)	−0.0155 *** (0.0056)	−0.0178 *** (0.0051)	0.0036 (0.0046)
Bank Concentration	0.0173 *** (0.0034)	0.0062 ** (0.0031)	0.0107 *** (0.0034)	0.0097 *** (0.0031)	0.0055 (0.0037)
Nonperforming Loans/Total Gross Loans	−0.0252 * (0.0150)	−0.0310 ** (0.0133)	0.0129 (0.0135)	0.0157 (0.0130)	−0.0413 *** (0.0143)
Government Effectiveness	−0.7498 *** (0.2709)	−0.5042 * (0.2685)	−0.0706 (0.2885)	0.6634 ** (0.2724)	−1.4471 *** (0.2992)
Financial Freedom	0.0148 *** (0.0031)	0.0043 (0.0027)	0.0085 *** (0.0029)	−0.0056 ** (0.0027)	0.0274 *** (0.0035)
Regulatory Quality	−1.0308 *** (0.3041)	−0.6712 ** (0.2816)	−0.2357 (0.2887)	0.1848 (0.2657)	−1.6676 *** (0.3429)
Inflation	0.1028 *** (0.0264)	0.0426 * (0.0221)	0.0532 ** (0.0196)	0.0739 *** (0.0184)	0.0104 (0.0245)
GDP per Capita	−0.0071 (0.2140)	0.5382 ** (0.2152)	−0.6607 *** (0.2315)	−0.3650 * (0.2144)	0.4882 ** (0.2354)
Effective Average Tax Rate	0.0781 *** (0.0247)	0.0878 *** (0.0238)	−0.0237 (0.0242)	0.0496 ** (0.0229)	0.0148 (0.0250)
Constant	−7.5934 *** (2.2250)	−8.1959 *** (2.1876)	−0.2636 (2.2994)	−0.6969 (2.1131)	−10.1358 *** (2.3116)
Observations	1416	1416	1416	1416	1416
Wald chi-squared test	0.0000	0.0000	0.0000	0.0000	0.0000
<i>p</i> -value					
AUROC	0.7454	0.6968	0.6846	0.6899	0.7348
Pseudo R-squared	0.1404	0.0831	0.0694	0.0801	0.1222
Method of estimation	Logit	Logit	Logit	Logit	Logit

Note: This table presents the estimation results of Equation (1) using the Probit estimation technique. The variables are defined in Table A1 from Appendix A. Wald chi-squared test is the model test that assesses the validity of the overall model with the null hypothesis that the estimated coefficients are simultaneously equal to zero. AUROC is the Area Under Curve Receiver Operator Characteristic. Robust standard errors in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

4.4. Further Analysis

The last part of our study is focused on the separation of the period before and after the 2008 global financial crisis in order to capture any change in the typology of financial institutions and investors' behavior (Tables 8 and 9, respectively). At a first analysis of the dataset, between 2009 and 2018 there was a decrease of 22% in the number

of M&As, from 122 to only 95. This has also influenced the number of observations, during 2000–2008 we identified 1323 instances compared with 2009–2018 where we had 2606 instances. The first conclusion that can be reached is that the dynamics of the M&A market were negatively affected by the economic crash, a trend that was also confirmed by the global developments. Nonetheless, a number of changes have been identified by Rao-Nicholson and Salaber (2016) which have concluded over an increased interest in cross-border transactions including the emerging markets from 3.6% before 2008 to 18.6% in the following period. Moreover, the amounts involved in operations between different emerging markets increased from EUR 6.8 billion to EUR 17.5 billion in the post-crisis period, confirming once again their importance.

Table 8. Bank-level, banking system-level, and macroeconomic determinants of M&As before 2008.

Model	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Merged	Target	Acquirer	Domestic	Cross-Border
Size	0.6751 *** (0.1242)	0.2885 *** (0.0973)	0.2043 * (0.1094)	0.0853 (0.0981)	0.4033 *** (0.0951)
Equity/Total Assets	−0.0582 ** (0.0247)	−0.0290 (0.0190)	−0.0744 * (0.0393)	−0.0937 *** (0.0293)	−0.0025 (0.0207)
Cost to Income Ratio	0.0008 (0.0067)	−0.0043 (0.0068)	−0.0023 (0.0102)	−0.0042 (0.0083)	0.0016 (0.0059)
Return on Average Equity (ROAE)	−0.0229 (0.0200)	−0.0295 * (0.0179)	0.0119 (0.0129)	−0.0011 (0.0134)	−0.0174 (0.0127)
Net Loans/Total Assets	−0.0473 *** (0.0087)	−0.0322 *** (0.0088)	−0.0066 (0.0099)	−0.0332 *** (0.0103)	−0.0108 (0.0071)
Impaired Loans/Gross Loans	0.0136 (0.0154)	−0.0795 *** (0.0251)	0.0836 *** (0.0258)	0.0552 ** (0.0235)	−0.0669 *** (0.0229)
Total Customer Deposits/Total Assets	1.0302 (0.8867)	−0.1781 (0.8500)	1.6105 (1.2291)	−1.0966 (1.0956)	2.1076 ** (0.9539)
Interbank Ratio	−0.0011 * (0.0006)	−0.0010 * (0.0006)	−0.0001 (0.0008)	0.0012 (0.0009)	−0.0027 *** (0.0008)
Liquid Assets/Tot Deposits and Borrowings	−0.0280 ** (0.0115)	−0.0022 (0.0097)	−0.0303 *** (0.0116)	−0.0341 *** (0.0121)	0.0094 (0.0099)
Bank Concentration	0.0438 *** (0.0080)	0.0076 (0.0059)	0.0366 *** (0.0079)	0.0399 *** (0.0075)	0.0024 (0.0066)
Nonperforming Loans/Total Gross Loans	−0.1125 (0.0911)	−0.0921 (0.0777)	0.0727 (0.0925)	−0.0189 (0.0855)	−0.0525 (0.0831)
Government Effectiveness	1.2237 ** (0.5173)	0.8721 (0.5500)	0.1551 (0.5181)	1.6078 *** (0.5260)	−0.7421 (0.5314)
Financial Freedom	0.0107 * (0.0056)	−0.0029 (0.0043)	0.0044 (0.0052)	−0.0170 *** (0.0051)	0.0236 *** (0.0056)
Regulatory Quality	−2.6193 *** (0.6035)	−1.4745 *** (0.5665)	−0.7434 (0.6713)	−0.3272 (0.6121)	−2.2642 *** (0.5907)
Inflation	0.0345 (0.0290)	0.0159 (0.0251)	0.0431 (0.0308)	0.0296 (0.0319)	0.0210 (0.0286)
GDP per Capita	−0.5205 ** (0.2649)	0.1300 (0.2394)	−0.7468 *** (0.2773)	−0.6535** (0.2707)	0.4397 * (0.2632)
Constant	−1.1778 (2.6857)	−1.4529 (2.7409)	1.2852 (2.8752)	6.6380 ** (2.9087)	−10.0087 *** (2.6725)
Observations	421	421	421	421	421
Wald chi-squared test <i>p</i> -value	0.0000	0.0000	0.0000	0.0000	0.0000
AUROC	0.8247	0.7381	0.7736	0.8196	0.7662
Pseudo R-squared	0.2744	0.1304	0.1640	0.2421	0.1671
Estimation method	Logit	Logit	Logit	Logit	Logit

Note: This table presents the estimation results of Equation (1) using the Probit estimation technique. The variables are defined in Table A1 from Appendix A. Wald chi-squared test is the model test that assesses the validity of the overall model with the null hypothesis that the estimated coefficients are simultaneously equal to zero. AUCROC is the Area Under Curve Receiver Operator Characteristic. Robust standard errors in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Table 9. Bank-level, banking system-level, and macroeconomic determinants of M&As after 2008.

Model	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Merged	Target	Acquirer	Domestic	Cross-Border
Size	0.4460 *** (0.0500)	0.2769 *** (0.0449)	0.1631 *** (0.0509)	0.1519 *** (0.0472)	0.3349 *** (0.0517)
Equity/Total Assets	−0.0013 (0.0095)	−0.0101 (0.0092)	0.0099 (0.0105)	−0.0285 ** (0.0137)	0.0261 *** (0.0101)
Cost to Income Ratio	−0.0010 (0.0020)	−0.0030 * (0.0016)	0.0019 (0.0020)	0.0003 (0.0019)	−0.0015 (0.0015)
Return on Average Equity (ROAE)	−0.0060 *** (0.0020)	−0.0080 *** (0.0020)	0.0035 ** (0.0015)	−0.0009 (0.0017)	−0.0046 *** (0.0013)
Net Loans/Total Assets	−0.0024 (0.0049)	−0.0088 ** (0.0041)	0.0122 ** (0.0061)	−0.0125 ** (0.0051)	0.0117 ** (0.0047)
Impaired Loans/Gross Loans	0.0050 *** (0.0015)	0.0019 (0.0016)	0.0039 ** (0.0018)	0.0031 * (0.0018)	0.0025 (0.0016)
Total Customer Deposits/Total Assets	0.5879 (0.4202)	−0.1600 (0.4202)	1.2482 ** (0.5584)	0.8558 * (0.4723)	0.0150 (0.4220)
Interbank Ratio	−0.0007 ** (0.0003)	−0.0008 ** (0.0004)	0.0002 (0.0004)	0.0002 (0.0004)	−0.0009 ** (0.0004)
Liquid Assets/Tot Deposits and Borrowings	−0.0163 *** (0.0056)	−0.0066 (0.0045)	−0.0126 * (0.0070)	−0.0160 *** (0.0061)	−0.0058 (0.0049)
Bank Concentration	0.0089 *** (0.0030)	0.0031 (0.0028)	0.0076 ** (0.0034)	0.0064 ** (0.0030)	0.0034 (0.0031)
Nonperforming Loans/Total Gross Loans	−0.0211 (0.0135)	−0.0365 *** (0.0126)	0.0242 * (0.0133)	0.0133 (0.0126)	−0.0337 ** (0.0133)
Government Effectiveness	−0.3255 (0.2368)	0.2195 (0.2503)	−0.6676 ** (0.2634)	0.2470 (0.2699)	−0.6857 ** (0.2692)
Financial Freedom	0.0035 (0.0034)	0.0015 (0.0027)	0.0028 (0.0031)	−0.0076 ** (0.0030)	0.0125 *** (0.0028)
Regulatory Quality	−0.3657 (0.3077)	−0.8561 *** (0.2939)	0.5435* (0.3013)	0.3920 (0.2829)	−0.8420 *** (0.3252)
Inflation,	0.1673 *** (0.0357)	0.1089 *** (0.0324)	0.0595 * (0.0359)	0.0794 ** (0.0340)	0.1082 ** (0.0339)
GDP per Capita	0.0058 (0.1683)	−0.0108 (0.1595)	0.1628 (0.1951)	0.4161 ** (0.2072)	−0.2598 (0.1582)
Constant	−5.9954 *** (1.5808)	−2.8973 ** (1.4317)	−7.5389 *** (2.0338)	−6.5989 *** (2.0294)	−3.9925 *** (1.4498)
Observations	1508	1508	1508	1508	1508
Wald chi-squared test	0.0000	0.0000	0.0000	0.0000	0.0000
<i>p</i> -value					
AUROC	0.7229	0.6756	0.6719	0.7058	0.7045
Pseudo R-squared	0.1070	0.0677	0.0579	0.0908	0.0922
Estimation method	Logit	Logit	Logit	Logit	Logit

Note: This table presents the estimation results of Equation (1) using the Probit estimation technique. The variables are defined in Table A1 from Appendix A. Wald chi-squared test is the model test that assesses the validity of the overall model with the null hypothesis that the estimated coefficients are simultaneously equal to zero. AUCROC is the Area Under Curve Receiver Operator Characteristic. Robust standard errors in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Analyzing the differences between national versus cross-border M&As before (Table 8) and after the global financial crisis (Table 9), the general remark is that investors turned to banks with healthy indicators of profitability and liquidity during 2009–2018, compared to the previous period where they looked for entities with operational issues or credit risk. In other words, before the financial crisis, a bank was more likely to be acquired in a domestic transaction if it was poorly capitalized, have liquidity problems, and a high share

of impaired loans. After the manifestation of the financial crisis, the same bank had to keep its liquidity, capitalization, and credit risk issues, but this time size and funding structure turn out to positively influence the probability of a bank being involved in a domestic M&A transaction. Looking at the macroeconomic indicators, government effectiveness is not an important driver after the 2008 meltdown, whereas inflation and GDP per capita manifest a positive and statistically significant impact.

Considering the cross-border M&As, there is a significant difference between the pre- and post-financial crisis periods. Until 2008, the most important attributes were the size of the bank, the low share of impaired loans, and a low interbank interest rate, which can be translated into an inefficiency of the national banking system but an efficient balance sheet. After 2008, these attributes changed the size, capitalization, low performance captured by ROAE, liquidity, and a significant volume of deposits as a share of total assets. In conclusion, after the financial crisis, the restructuring decision was much more thorough and studied, being materialized only when the acquiring bank was capable both operationally and financially. At the macroeconomic level, the indicators that increased the possibility of involvement in a cross-border M&A remained almost unchanged, with financial freedom and the regulatory framework having a significant influence. Regarding the economic development, if before the financial crisis a high level of GDP per capita was directly proportional to the orientation towards other markets, in the following period the direction was the opposite, meaning that investors no longer felt comfortable with this approach.

When it comes to target versus acquirer, it can be noted that the investors are looking for stability and lower associated risks in the aftermath of the global financial crisis. If before the outbreak of the financial crisis the attributes that increased the chances of an entity initiating a bid were size, the level of capitalization, and liquidity, after 2008 it was necessary for the targeted bank to record a positive ROAE, together with a balanced structure of deposits in relation to loans. Analyzing the national particularities, after the financial crisis most of them did not turn out to be statistically significant, the rigorous regulatory framework tilting the balance towards the bidder instead of the targeted bank. On the same note between 2009 and 2018, the higher the level of nonperforming loans, the lower the chance for that bank to be targeted.

If we consider only the instance of the bank being merged or not, the differences between the two periods do not differ significantly. The size of the bank and the weak capitalization will increase the likelihood of a merger before crisis, whereas after 2008 the share of impaired loans plays an important role. Nonetheless, these results may also be due to the deterioration of indicators in general as a result of the economic meltdown. From a national perspective before 2008, the countries with high government effectiveness and financial freedom and low levels of GDP per capita had higher dynamics of the M&A market. After 2008, the investors have been focused only on the level of inflation.

5. Conclusions

The main objective of the study is to identify those mutual characteristics of all banking institutions from Central and Eastern Europe that are prone to be acquired versus acquirer, or national versus cross-border. The restructuring operations offer a solution to a multitude of business issues, being advertised as a win-win for both parties. The truth differs from case to case, the literature drawing a series of hypotheses to support in particular the theoretical advantages rather than actual synergies. It is clear that depending on the type of operation, the particularities of the banks involved will also be different. The basic idea that operational and financial synergies come from joining two different types of institutions has been concluded especially in the developed markets, like the US or Western Europe. Moreover, the real implications of bank mergers and acquisitions can be seen by looking at a longer period of time, but many of the existing studies are using a much shorter window. This paper is addressing all of these gaps by conducting a comprehensive analysis with more than 200 mergers and acquisitions throughout 19 years from Central and Eastern

Europe. The conclusions have articulated the main bank-level and national characteristics and the significance they have on the merging decision.

Our analysis shows that from the category of bank-level characteristics, the most important promoters of mergers and acquisitions are size, profitability (ROAE), and liquidity as well as interbank interest rates. Regarding the targeted institutions, the results are in line with the literature, confirming the trend of absorption of those with performance issues, cost management, and inefficiency in general. On the other side are the institutions with a positive return and a high share of deposits in their funding structure. The same balance will be maintained within cross-border and domestic M&As. Among the banking system and macroeconomic factors, the higher the inflation, the level of concentration, and the financial freedom, the more dynamic the market will be. Higher effective average tax rate, which is associated with reduced tax avoidance, influences banks in a positive manner to be involved in an M&A process, findings that hold for targeted banks and domestic transactions.

In the race of gaining as much market share as possible, some institutions may overlook the materialization of the too-big-to-fail risk. Despite their high revenues, the financial conglomerates can have a destabilizing impact on the banking system as they generally focus on lowering costs and targeting a particular segment of customers in order to maximize economies of scale. Risk diversification is almost non-existent, increasing the exposure to a systemic shock (Beck et al. 2004). The financial crisis has led to a boost of risk aversion, with the behavior of investors being much more constrained. The research does not necessarily capture a change in the preferences or the typologies of financial institutions but rather an intensification of the issues pursued in order to confirm the decision. From this point of view, the proxies will remain the same as the level of liquidity, performance, or efficiency but captured or confirmed by extra indicators.

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Appendix A

Table A1. Description of variables.

Variable	Description	Level	Source
Dependent variables			
Merged	Dummy variable which takes the value of 1 if a financial institution has been involved in a merger or acquisition, and 0 otherwise	per bank	Zephyr
Target	Dummy variable which takes the value of 1 if a financial institution has been acquired, and 0 otherwise	per bank	Zephyr

Table A1. Cont.

Variable	Description	Level	Source
Acquirer	Dummy variable which takes the value of 1 if a financial institution has acquired another entity, and 0 otherwise	per bank	Zephyr
Domestic	Dummy variable which takes the value of 1 if a financial institution has been involved in a national merger or acquisition, and 0 otherwise	per bank	Zephyr
Cross-border	Dummy variable which takes the value of 1 if a financial institution has been involved in a cross-border merger or acquisition, and 0 otherwise	per bank	Zephyr
Independent variables, bank-level			
Size	Natural logarithm of bank total assets	per bank/annual	BankFocus
Equity/Total Assets (%)	The level of bank capitalization, computed as common equity over total assets	per bank/annual	BankFocus
Cost to Income Ratio (%)	An efficiency ratio, computed as the ratio between the operating expenses and the operating income	per bank/annual	BankFocus
Return on Average Equity (ROAE) (%)	A performance ratio, computed as the ratio between the net income and common equity	per bank/annual	BankFocus
Net Loans/Total Assets (%)	A ratio defining lending activities, computed as total amount of net loans over total assets	per bank/annual	BankFocus
Impaired Loans/Gross Loans (%)	A credit risk indicator, defined as the volume of impaired loans to total gross loans	per bank/annual	BankFocus
Total Customer Deposits/Total Assets (%)	A ratio defining funding structure, computed as total amount of customer deposits over total assets	per bank/annual	BankFocus
Interbank Ratio (%)	The rate of interest charged on short-term loans made between banks	per bank/annual	BankFocus
Liquid Assets/Total Deposits and Borrowings (%)	A deposit runoff ratio that looks at what percentage of deposit and borrowings could be met if they were withdrawn suddenly	per bank/annual	BankFocus
Independent variables, banking system-level			
Bank concentration (%)	Assets of three largest commercial banks as a share of total commercial banking assets	per country/annual	Global Financial Development Database
Nonperforming Loans/Total Gross Loans (%)	A banking system stability indicator, computed as the value of nonperforming loans divided by the total value of the loan portfolio (including nonperforming loans before the deduction of specific loan-loss provisions)	per country/annual	Global Financial Development Database
Independent variables, country-level			
Government Effectiveness	The level of perception of the quality of the public and civil services and the degree of independence against political pressure	per country/annual	World Governance Indicators
Financial Freedom	Encompass the rule of law, government size, regulatory efficiency, and open markets level of freedom and development	per country/annual	The Heritage Foundation
Regulatory Quality	The quality of the judicial framework	per country/annual	World Governance Indicators

Table A1. Cont.

Variable	Description	Level	Source
Inflation (%)	Annual percentage change in the cost to the average consumer of acquiring a basket of goods and services	per country/annual	World Development Indicators
GDP per Capita	Natural logarithm of gross domestic product divided by midyear population in current US dollars	per country/annual	World Development Indicators
Effective Average Tax Rate (%)	Corporate effective average tax rate	per country/annual	Zentrum für Europäische Wirtschaftsforschung(ZEW)

Appendix B

Table A2. Summary statistics of variables used in the empirical analysis.

Variable	Observations	Mean	Std. Dev.	Min	Max
Merged	1929	0.66	0.47	0.00	1.00
Target	1929	0.42	0.49	0.00	1.00
Acquirer	1929	0.24	0.43	0.00	1.00
Domestic	1929	0.32	0.47	0.00	1.00
Cross-border	1929	0.34	0.47	0.00	1.00
Size	1929	14.37	1.64	8.68	18.14
Equity/Total Assets	1929	12.11	7.17	−91.32	80.25
Cost to Income Ratio	1929	70.25	41.70	5.52	686.74
Return on Average Equity (ROAE)	1929	1.02	38.42	−767.50	342.13
Net Loans/Total Assets	1929	61.10	16.49	0.06	162.19
Impaired Loans/Gross Loans	1929	46.14	40.37	−0.54	343.81
Total Customer Deposits/Total Assets	1929	0.63	0.17	0.00	1.08
Interbank Ratio	1929	146.54	196.09	0.00	968.45
Liquid Assets/Total Deposits and Borrowings	1929	23.41	15.62	0.04	162.14
Bank Concentration	1929	38.34	29.21	0.00	98.87
Nonperforming Loans/Total Gross Loans	1929	5.56	6.46	0.00	23.99
Government Effectiveness	1929	0.35	0.47	−0.76	1.19
Financial Freedom	1929	44.62	29.00	0.00	90.00
Regulatory Quality	1929	0.51	0.46	−0.45	1.70
Inflation	1929	1.96	3.26	−1.58	45.67
GDP per Capita	1929	9.16	0.65	6.45	10.22
Effective Average Tax Rate	1416	16.29	3.16	8.80	25.80

Note: This table presents the descriptive statistics of the variables used in the empirical analysis. The variables are defined in Table A1 from Annexes.

Notes

- ¹ Additionally, we include in all models year-fixed effects to capture the influence of aggregate time-series trends. Overall, the findings are consistent and are available upon request.

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