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What do Premiums Paid for Bank M&As Reflect? The Case of the European Union

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Abstract

Acquisition premiums help to explain the motives that acquirers link to control. For a sample of 255 European bank mergers, we analyze the takeover premiums paid by bidding institutions. We find that bidders value profitable, high-growth and low-risk banks. We also find some evidence that bank regulation and deposit insurance regimes in Europe have measurable effects on target valuations. Targets in stricter regulatory regimes, presumably because of the higher expected costs of compliance, attract lower premiums. However, we find no evidence that bidders seek to extract benefits from regulators either by paying a premium for deals in less regulated regimes or by becoming 'too big to fail'.

What do Premiums Paid for Bank M&As Reflect? The Case of the European Union

1. Introduction

Takeovers in the banking industry are important for all of the reasons that takeovers in the nonfinancial sector are important. Bank takeovers also have important implications for prudential supervision and government safety nets. Domestic takeovers increase the relative importance of the combined bank, increasing the pressure to treat these banks as too-big-to-fail. Also, cross-border takeovers have both prudential supervision and safety net implications.

While the literature recognizes the importance of U.S. bank takeovers, far less attention has been given to takeovers in the European Union (EU).[1] This is unfortunate because the EU is trying to promote cross-border takeovers as a way of developing a single market in financial services, a goal which received added impetus from the adoption of the Euro throughout much of the EU. Attaining this goal requires the growth of cross-border banks because the financial systems of most EU countries are bank-based. The European Commission has expressed concern with the slow pace and size of cross-border takeovers, especially relative to domestic takeovers as discussed in Hernando, Nieto and Wall (2009).

The relative lack of attention to EU takeovers is also unfortunate because the EU provides greater diversity of banking and securities laws than the U.S. which allows the testing

[1] For an overview of the European banking literature, see Berglöf, Fulghieri, Gual, Mayer, Barros and Vives (2005) and Goddard, Molyneux, Wilson and Tavakoli (2007).

of hypotheses which cannot be tested with U.S. data. One important area where the EU allows substantial differences is in the areas of prudential supervision and deposit insurance. The EU directives set minimum standards to harmonize some aspects of bank prudential regulation and deposit insurance. However, discretion given to member states in implementing these directives raises the possibility that the remaining cross-border differences may influence bank takeovers.

Similarly in the areas of corporate governance and takeover law, the EU sets some broad standards but important differences remain across member states. Some of these rules relate to the protection afforded to shareholders. For example, Hagendorff, Collins and Keasey (2008) show that variations in shareholder protections have a significant impact on bidding banks' stock returns around the takeover announcement. Another important difference relates to the acquisition process. In the vast majority of U.S. acquisitions, the acquirer's ownership goes from less than 5 percent of a U.S. target bank's shares to 100 percent of the target upon consummation of the merger due to federal banking and securities regulations. In contrast, staggered acquisitions in which the acquirer purchases shares in a series of transactions are much more common in Europe. However, almost all EU countries have adopted some version of a mandatory bid rules (MBR) whereby once the acquirer owns more than some fixed fraction of the target's voting rights, the acquirer is obligated to make an offer for all of the remaining shares at the highest price paid by the acquirer for the target's shares in a preceding time period (typically 12 months).

The purpose of this paper is to examine one aspect of the bank takeover process, the premiums paid in bank takeovers in the EU-25 (before the last enlargement) between 1997 and

2007.[2] The sample includes both within country and cross-border mergers. Targets include both publicly traded banks and non-trade banks. Along with a general analysis of takeovers that may provide insights useful in building a single market for financial services in the EU, this paper provides evidence on the target valuation effects of country's safety nets, shareholder protection as well as some aspects of takeover legislation.

The paper is organized as follows. The next section provides a brief informal model of the determinants of the prices paid in bank takeovers and applies this informal model to a review of the existing literature and develops testable hypotheses. The third section reviews the data and empirical model. The fourth and fifth sections present the univariate and multivariate empirical analysis, respectively. The paper concludes with a review and policy implications.

2. Literature review and testable implications

Table 1 summarizes a number of these studies of bank takeover pricing in terms of their sample selection criteria and whether they use pre-takeover book value or market value as a control.[3] The only study specifically focused on Europe in Table 1 is Diaz and Azofra (2009), which includes mergers only through 2000 and does not explicitly consider any implications linked to the government regulation of banks.[4]

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[2] Other possible dimensions for European bank mergers include: (1) the shareholder wealth implications for shareholders (Cybo-Ottone and Murcia, 2000; Hagendorff, Collins and Keasey, 2008; and Ekkayokkaya et al., 2009), (2) the long-run performance following bank M&A (Diaz et al., 2004; Campa and Hernando, 2006), and (3) the determinants which make banks takeover targets (Hernando, Nieto and Wall., 2009).

[3] The dependent variable in almost all papers is some variation on the ratio of the merger price divided by the target's pre-merger value, where pre-merger value is either its pre-announcement accounting (book) value or its pre-announcement market value. However, some papers estimate the merger price with either the pre-merger book or market value as a control variable.

[4] The authors are not aware of any other study of the prices paid in European bank mergers.

The next subsection provides a brief informal model of bank takeover pricing. The following subsections apply that model to evaluate the existing literature on the determinants of bank takeover prices through.

2.1 An informal model of bank takeover pricing

The starting point in valuing a bank to another bank acquirer is the existing value of the bank based on its current profitability, its risk and its likely growth based on its recent experience. A bank acquirer must also evaluate how assuming control of the target is likely to change the target bank's value. These changes in value arise both from changes intrinsic to the business due to the change in control and changes in the external environment that are unique to banking. In particular, changes in the combined banks' exposure to prudential supervision and coverage by the safety net.

The valuation effects of bank M&A may also depend upon the rules regarding the corporate governance of the target and the takeover process. Rules that strengthen the protection of the target's shareholders increase the share of the target's profits going to the shareholders and, hence, their takeover reservation price. Rules related to the takeover process may also be important in an environment with staggered takeovers. Absent such rules, the acquirer may pay a premium to a few shareholders to obtain effective control and then use such control to squeeze the other shareholders into selling at a lower price (see Nenova, 2006). The EU takeover directive has led to the establishment of mandatory bid rules (MBRs) to protect the minority shareholders in the target company. Under an MBR, once the acquirer's ownership passes some threshold, the acquirer is required to make a bid for the remaining shares at a price related to that

paid in recent share acquisitions (see Directive 2004/25/EC of the European Parliament and of the Council of 21 April 2004 on takeover bids).[5]

2.2 Current profitability and risk

Almost all empirical analyses of takeover pricing follow theory by including a profitability measure as a proxy for the target's expected cash flow as an explanatory variable. Target profitability is typically proxied by the target's return on assets, and, as predicted by theory, the coefficient on is generally significantly positive.[6]

Many studies of takeover price do not include a risk term. Those studies that do include such terms often follow Benston, Hunter and Wall (1995) in analyzing whether acquirers pay more for banks that would reduce the combined firms overall risk (diversification hypothesis) or more for banks that would increase the value of the government safety net to the combined firms (deposit insurance put hypothesis). The diversification hypothesis predicts that acquirers will pay less for targets with high variance of own profitability and high covariance with the acquirer's profitability. The deposit insurance put hypothesis predicts that acquirers will pay more for targets with high variance and high covariance. Benston, Hunter and Wall (1995) and Brewer, Jackson and Jagtiani (2000) find support for the diversification hypothesis with significant negative coefficients on the variance of the target's ROE and an insignificant coefficients on the covariance of the target and acquirer's ROE. Brewer, Jackson and Jagtiani (2007) report different results, but where significant, the coefficients on the target's variance of

[5] *OJ L 142, 30.4.2004, p. 12–23*

[6] Studies that found a positive coefficient on their measure of profitability include Adkisson and Fraser (1990), Beatty, Santomero and Smirlock (1987), Brewer, Jackson and Jagtiani, (2000), Cheng, Gup and Wall (1989), Diaz and Azofra (2009), Palia (1993), and Shawky, Kilb and Staas (1996). Rogowski and Simons (1989) estimate an insignificant coefficient on return on equity when the dependent variable is the purchase price to book ratio, but obtain a significant positive coefficient when the dependent variable is the purchase price premium to deposits ratio.

ROA and covariance also support the diversification hypothesis.[7] By contrast, Carbo et al. (2009), using a sample of European banks that undertook cross-border M&A activity, find that these banks were responding principally to opportunities for shifting risk onto EU safety nets, what would be consistent with the deposit insurance put hypothesis.

A related strand of literature has analyzed the type of mergers that appear to create more value for the shareholders of the merging companies. A common result is that focusing mergers usually generate larger returns than diversifying transactions (see DeLong, 2001, and Beitel et al., 2004). Thus, bidders might be willing to pay higher premiums in non-diversifying deals as they are potentially more value creating.

2.3 Changes in profitability post acquisition

Along with the historic profitability of the target, acquirers also value opportunities to grow the target's profits. One source of profit growth is the asset growth rate of the target bank. A common proxy for the potential future growth rate of the target is its historical growth rate. Cheng, Gup and Wall (1989) obtain a positive coefficient on core deposit growth and on asset growth in many of their specifications. However, Brewer and Jagtiani (2007) obtain negative, often significant coefficients in a model estimating premium over market value. One way to reconcile these seemingly contradictory results is that a premium for growth may already be priced into the targets' stock price and acquirers' are not expected to increase this growth rate. The coefficients on the target asset growth rate in Diaz and Azofra (2009) and in Palia (1993) are insignificant.

[7] Brewer, Jackson and Jagtiani (2007) find that the coefficient on the covariance is significantly negative when it is interacted with a binary variable that takes a value of one when both the acquirer and target are "too-big-to-fail."

Higher levels of target bank capital provide some benefits to acquirers in that it allows acquirers to grow without a capital contribution from the acquirer while continuing to pay dividends. On the other hand, higher levels of capital also mean a greater value of shares must be acquired which would dilute the premium paid per share. Although the literature finds mixed results for the level of capital, the more common result of a negative coefficient supports the premium dilution hypothesis. A significantly positive coefficient on capital is found in the model estimated by Adkisson and Fraser (1990). Significantly negative coefficients are estimated in Beatty, Santomero and Smirlock (1987), Diaz and Azofra (2009), Hakes, Brown and Rappaport (1997), Rogowski and Simonson (1989), Shawky, Kilb and Staas (1996), and in most of the models estimated in Brewer, Jackson and Jagtiani (2007).[8] The estimated coefficient is insignificant in Palia (1993).

Another source of profitability and potential growth in profitability is the degree of market concentration in the target's market. More concentrated markets may offer greater opportunities to increase profits.[9] Beatty, Santomero and Smirlock (1987) obtain a positive coefficient on the Herfindahl index of the target's markets and Palia (1993) find that the coefficient on the four firm concentration ratio in the target's state is significantly positive in a model estimating the book value premium. However, the coefficient on the four firm concentration ratio of the target state in Hakes, Brown and Rappaport (1997) is insignificant as are the Herfindahl index in Rogowski and Simonson (1989) and for the target's country in Diaz and Azofra (2009).

[8] The equity capital variable in Beatty, Santomero and Smirlock is the sum of equity capital and the loan loss allowance divided by total capital.

[9] A positive correlation would also be expected if banks in more concentrated markets can maintain their current level of profitability without increasing their risk.

Cross-border acquisitions offer opportunities to both increase and decrease the profitability of the target. The opportunity to increase the profitability comes from the potential for the acquirer to take innovations in its home market and bring them to the acquirer's market. However, cross-border mergers limit the scope for cost savings (e.g. by saving on duplicate branch networks) and increase the possibility that the acquirer will make cultural or legal mistakes in its management and marketing of the target bank after the acquisition.

'Cross-border' takeovers in a U.S. context are takeovers across state boundary lines. As the differences between U.S. states are generally smaller than those between EU member states, cross-border acquisitions in the U.S. arguably offer both smaller potential benefits and costs. Palia (1993), Rogowski and Simonson (1989) and Shawky, Kilb and Staas (1996) estimate a significantly positive coefficient on interstate banking whereas Brewer, Jackson and Jagtiani (2000) obtain significantly negative coefficients. The estimated coefficient for cross-border takeovers is insignificant in Brewer, Jackson and Jagtiani (2007) and Hakes, Brown and Rappaport (1997). The coefficients on a binary variable for cross-border takeovers in Europe estimated by Diaz and Azofra (2009) in various models are consistently insignificant.

One of the costs of a takeover is that of integrating the target bank into the acquirer. Banks that are smaller relative the acquirer are likely to be easier and lower cost to integrate into the acquirer. However, once the integration is complete, relatively larger targets may provide the acquirer with greater economies of scale. Relatively larger targets may also increase the chances that the post-merger banking organization will be considered "too-big-to-fail." Consistent with lower costs of integration, significant negative coefficients on size are found by Benston, Hunter and Wall (1995), Brewer, Jackson and Jagtiani (2007), Cheng, Gup and Wall (1989), Hakes, Brown and Rapport (1997) and Palia (1993). However, Brewer, Jackson and Jagtiani (2000),

Brewer and Jagtiani (2007) and Rogowski and Simonson (1989) obtain a positive coefficient. The estimated coefficient on relative asset size is insignificant in Diaz and Azofra (2009).

Another potential cost of integration arises if there is a mismatch between the extent of business line diversification of in the acquirer and that of the target. The more dissimilar the two firms, the greater the potential for high integration costs. However, more dissimilar business lines may also provide greater opportunities for diversification gains. Diaz and Azofra (2009) use cluster analysis to group banks by product strategies and proxy diversification by whether the two banks are in the same product group. That paper estimates an insignificant coefficient on their diversification measure.

2.4 Bank regulation and deposit insurance

The principle of minimum harmonization of regulation has been compatible with different regulatory and supervisory requirements in the EU. [10] More specifically, differences across EU countries are more likely to arise from differences in the costs associated with their regulation and deposit insurance.[11] It is conceivable that acquirers pay more for targets with lower regulatory and deposit insurance costs. On the other hand, for cross-border mergers stricter regulatory regime may increase the bidder's valuation of the target bank. This could be because given the additional complexity that cross-border M&A entails, stricter regulators may increase the acquirer's trust in the disclosure practices of the target (Buch and DeLong, 2004).

Studies of domestic bank merger premiums in the U.S. cannot consider regulatory and deposit insurance costs because most of those costs are determined by federal policy. The U.S.

[10] EU Directives on solvency and depositor protection were designed mainly with the aim of discouraging credit institutions within the EU from using different features of sound and safety requirements as well as depositor protection to compete with each other. Similar rational can be used for the Directives on investor protection.

[11] See Kane (2000) and Carbo, Kane, and Rodriguez (2008, 2009).

has an incentive compatible mechanism for resolving small and medium sized banks aimed at minimizing tax payers' costs of resolving banks in crisis.[12] Such ability has not been demonstrated for the largest U.S. banks with the result that many market participants believed some U.S. banks were 'too-big-to-fail' (TBTF).[13] Brewer and Jagtiani (2007) find evidence that acquirers pay more for deals that are likely to strengthen the impression that the post-merger organization is TBTF.

2.5 Investor protection and takeover laws

More generally, the value that bidders assign to control over a target bank will depend on the bidder's trust in the quality of the target's disclosure practices as well as in the enforceability of the ownership rights which are being acquired. The legal protection of minority shareholders varies substantially across countries with wide-ranging implications for the development of financial systems and the design of corporate governance systems (LaPorta et al., 1998; Djankov et al., 2008). When investor protection is weak, insiders (managers and majority shareholders) enjoy more opportunities to expropriate minority shareholders and extract higher private benefits of control (Dyck and Zingales, 2004). Rossi and Volpin (2004) and Bris and Cabolis (2008) show that takeover premiums increase under higher protection regimes and interpret this as evidence that investor protection increases activity in the market for corporate control.

Studies of domestic bank takeover premiums in the U.S. do not consider investor protection rules, which are partly determined by federal standards and partly by state policies.

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[12] The U.S. banking literature has historically focused on size as a proxy for a bank's importance to financial stability, thus, the focus in literature on "too-big-to-fail" banks. Most recently, many analysts have come to recognize that while size is correlated with a bank's importance to financial stability, size per se is neither necessary nor sufficient for a bank to be systemically important.

[13] See Stern and Feldman (2004).

Diaz and Azofra (2009) also do not consider investor protection. However, Hagendorff, Collins and Keasey (2008) analyze the impact of investor protection regimes in Europe and the U.S. on stock returns around the time of bank takeover announcements. Their results indicate that bidder banks receive higher returns when the target is in a low investor protection country. This is consistent with target shareholders receiving a smaller portion of the gains in countries with low investor protection.

Finally, bank merger valuations may also reflect the extent to which takeover legislation requires premiums to be shared among equity holders. For listed firms, the EU Takeover Directive has introduced mandatory bid rules (MBRs) in most countries. By requiring bidders to (i) tender for all remaining shares once they exceed a certain ownership threshold in the target and (ii) to pay a price based on when it passed the MBR threshold, MBRs protect minority shareholders from being squeezed into accepting a low premium once the transfer of the controlling block of voting rights has been completed (Nenova, 2006). Since controlling holders will be unable to attract the type of large premium which reflects their private benefits of control, MBRs are likely to lower their premiums, while increasing the premiums going to minority shareholders (see Dyck and Zingales, 2004). The model in Diaz and Azofra (2009) includes the acquirer's pre-acquisition ownership interest as a control for staggered takeovers. However, the model does not have any control for whether the acquisition triggers the MBR.

2.6 Other hypotheses

Prior studies have considered various other hypotheses that are either not relevant to the EU or not testable for our sample of banks. An example of a hypothesis that is not relevant to this paper is Adkisson, and Fraser (1990) inclusion of a binary variable for restrictions on intrastate takeovers that existed during for its sample.

A common set of hypotheses that are not testable with the available data for this paper's sample relate to the board and ownership structure of the target and sometimes also that of the acquirer. Papers including measures of these structures include Brewer, Jackson and Jagtiani, (2000), Brewer, Jackson and Jagtiani, (2007), and Palia (1993).

3 Empirical Strategy: Data and Model

3.1 The Sample

We obtain the sample of European bank mergers from Thomson Financial's M&A database. Deals are announced and completed between 1997 and 2007. Sample banks include commercial banks, mortgage and real estate banks, medium- and long-term credit banks, and bank holding companies which are chartered in the EU-25. We impose the following sampling criteria: The acquirer purchases at least 1% of the target's equity. Thomson Financial reports the value of the acquisition. Sample banks are not subsidiaries of financial institutions chartered outside the EU. We eliminate share repurchases from our sample. Finally, target and bidder banks have accounting data available on Fitch IBCA's Bankscope database. We ensured that accounting data are consistently reported in either International Financial Reporting Standards (IFRS) or local accounting principles for every deal.[14]

We then applied the following data cleaning procedure to our initial sample:

- We verified the deal characteristics from Thomson Financial (announcement date, offer price, deal value) against news articles from various sources on Lexis Nexis.

[14]IFRS have been introduced after 2004 and apply only to listed banks in our sample. IFRS introduced the fair value treatment of a larger variety of bank assets. Hence, combing different accounting standards for one bank may cause severe measurement errors. For example, Barclays experienced a year-on-year increase in the value of total assets of 30% following the adoption of IFRS.

Inconsistencies between the data obtained from Thomson Financial and the press coverage of three transactions were corrected or, if left unresolved, 19 deals were omitted from our sample.

- We omit 11 distressed target banks. We delete deals where the press coverage surrounding a transaction indicates that the target was a failing institutions or the book value premium paid by the target was smaller than -20%.
- We delete six observations from our sample where the price paid by the acquirer was linked to the exercise of a call option on the target's equity, In these cases, the takeover premium is likely to have been determined by factors prevailing at the time period the option was underwritten.

The final sample of European bank acquisitions contains 255 deals, of which 75 were cross-border and 155 were deals that involved targets that were listed banks.[15] We present an overview of the sample in Table 2.

3.2 Takeover Premiums

In order to compensate for the varying size of the target banks, most studies of bank merger pricing incorporate a measure of the pre-merger value of the target's equity (Shawky, Kilb and Staas, 1996; Brewer, Jackson and Jagtiani, 2000; Diaz et al., 2008). One such measure of the pre-merger equity is the target's book value as of the last reporting period before the merger announcement. Although book values are imperfect measures of the economic values, bank accounting values are likely to be closer to their economic value because both sides of

[15] In total, 16 out of the 255 deals do not report the value of the BVPREM. As a consequence, our regressions use 239 deals (146 are listed banks and 74 are cross border deals).

banks' balance sheet are dominated by short-term financial claims whose book value is likely to be close to its economic value.

An alternative is to deflate by the market value of the target's assets. The advantage of a market measure is that it incorporates the profitability of the target as it is currently being operated. One disadvantage is that it also incorporates investors' estimate of the expected discounted value of a takeover premium. This component of the target's stock price may be relatively large to the extent that the bank has long been regarded as a takeover target or to the extent that individuals with knowledge of the takeover discussions buy the target's stock in anticipation of the takeover. Another disadvantage is that market values are only available for publicly traded banks. The availability of takeover premium data for non-listed banks is an important issue, given the importance of non-listed financial institutions as suppliers of banking services in the EU as well as their involvement in the consolidation of national banking sectors (see Goddard et al., 2007).

We measure bank merger premiums as the purchase price paid for by the acquiring institution scaled by the pre-merger book value of the target bank's equity. We define the percentage book value premium (BVPREM) as

$$\text{BVPREM (\%)} = \left(\frac{\text{deal value}}{s \times \text{BV(equity)}} - 1 \right) \times 100, \qquad (1)$$

where s is the equity stake purchased and the book value of equity refers to the fiscal year before the merger announcement supplied by Thomson Financial.

3.3 Regulatory Data

One of our aims is to investigate whether regulatory differences affect target valuations in bank takeovers. We measure regulatory differences using a measure of regulatory strength, deposit insurance design, and the level of investor protection as summarized in Table 3.

3.3.1 Prudential regulation and supervision (Regulatory Strength)

We compile an index of regulatory strength based on the Barth et al. (2001) database on global banking supervision. We follow Buch and Delong (2008) and use this database to assemble a regulatory strength index which reflects the adoption of twelve supervisory powers by national regulators. The index components are: banks disclose risk management procedures; risk-weights are in line with Basle guidelines; the capital–asset ratio varies with credit risk; the capital–asset ratio varies with market risk; there is a formal definition of 'non-performing loan'; there are automatic mechanisms to sanction directors and managers; the supervisory agency can order directors/management to make provisions to cover losses; the supervisory agency can suspend the distribution if dividends, bonuses, or management fees; the latter has been enforced in the past five years; the supervisory agency can declare a bank insolvent; the agency can suspend ownership rights of a problem bank; the supervisory agency (or any other government agency) can take measures aimed at bank restructuring and reorganization.

The regulatory strength index is an equally-weighted sum of these 12 indicators. [16] Consequently, the index varies between 0 and 12 with higher scores indicating that banking sectors exhibit stronger supervisory environments and better enforcement.

[16] Where the database lists more than one indicator for a single question, we assign an index value of one if two or more of the sub questions apply.

3.3.2 Deposit Insurance

We also measure the strength of the deposit insurance regime by assembling a deposit insurance index, based on the information reported by the member states. The index reflects if (i) insurance premiums are risk-based, and (ii) the deposit guarantee scheme is pre-funded. Consequently, the deposit insurance index varies between 0 and 2 with higher values indicating stricter, and to banks, more costly deposit insurance arrangements.

3.2.3 Investor Protection

We obtain an index of anti-director rights from La Porta et al. (1998) and, for updated values after 2003, from Djankov et al. (2008). The index measures the extent to which national laws protect minority shareholders from opportunistic behavior by managers. Specifically, it reflects the inclusion of six legal provisions as regards the voting rights that shareholder possess to influence director appointments and other major corporate issues. The index varies between 0 and 6 with higher values indicating that financial systems are more shareholder-oriented.

In some countries, stricter enforcement of the existing legal provisions may partly substitute for weaker investor protection and vice versa (La Porta et al., 1998). To capture the quality of law enforcement, we follow Rossi and Volpin (2004) and Hagendorff et al. (2008) and multiply the anti-director index by an index of the rule of law. We use the rule of law index developed by the Worldbank (which we rebase such that it varies between 0 and 10) to capture the efficiency of the judiciary and enforceability of contracts through the courts. We call the resulting index investor protection.

4. Univariate Analysis

In this section, we present preliminary results on some of the key drivers of target valuations in European bank mergers. We examine the price paid for control, the status of the target and the geographic focus (cross-border vs. domestic) of the deal. We also analyze the impact of regulatory variables on the premiums in European bank mergers.

4.1 Premiums Paid for control

In section 2, we discussed the presence of a premium for control as well as the existence of MBR rules that protect minority shareholders in the target bank. Many (bank) M&A studies define control conservatively as the acquiring institution owning the majority of the voting equity in the target. In order to explore the threshold at which control takes place, Table 4 presents the mean and median takeover premiums (BVPREM) for deals that involve a change in control and purchases of minority stakes. We apply various control thresholds to our sample. In particular, we have considered that a change in control may take place, alternatively, when a deal causes the bidder to increase its ownership level from <10%, <20%, <30%, <40%, <50% or <MBR to above that level. The MBRs are applicable to the target country and are reported in Nenova (2006). For the full sample, we observe that those deals involving a change in control display higher premiums. The differences in terms of medians are statistically significant for all the threshold portfolios defined above. However, the differences are larger in absolute value for those deals that involve trespassing the 20% and 30% thresholds. The latter is approximately in line with the weighted average MBRs of our sample. [17]

[17] Weights correspond to the percentage of deals in the target country over total number of deals.

As presented in the introduction of this paper, one motivation for this paper is to analyze the patterns of staggered bank acquisitions which are common in Europe. Acquisitions are staggered when purchases of bank shares take place in a series of transactions. According to the European Commission (2005), this pattern of acquisition is more prevalent in banking and insurance than in other financial market segments. In our sample, 33 acquisitions involved more than one transaction (typically two) between the same acquirer and target. In most of these cases (23), the acquirer ultimately bought 100% of the target bank equity during the sampling period.

The analysis of the premiums paid in staggered acquisitions sheds further light on the price for control since ceteris paribus other determinants of the premium paid remain constant. Table 5 shows that the largest median premiums (BVPREM) are paid by acquirers which own less than 20% of the target's equity and increase their shareholding to above that level.

A control threshold of 20% is consistent with Hernando, Nieto and Wall (2009) and for the purpose of our regression model we have considered that a change in control takes place when a non listed bank or bank holding company that owns less than 20% of the target equity increases its shareholding to at least 20%.[18] This level of ownership also represents the minimum threshold for authorization by the prudential supervisors of the host country as established in the Directive 2007 / 44/ CE of the European Parliament and the Council amending the procedural rules and evaluation criteria for prudential assessment of acquisitions and increase of shareholdings. For the subsample of listed banks and for the purpose of defining control, we have considered the MBR in the target country.

[18] Also, IFRS accounting rules define 20% share ownership as a permanent investment in a company.

4.2 Domestic vs Cross-border Bank Mergers

The European Commission (2005) reports that in the financial sector, domestic deals are significantly larger than cross-border ones (leading to 'domestic champions' strongly focused on one country). This appears to have been especially true in the years 1999-2000. Table 6 shows that differences in the premiums paid for domestic and cross border deals are neither large nor statistically significant (in terms of either mean or median values). This is somewhat surprising given the more pronounced potential to cut costs in domestic mergers and the increased costs of cross-cultural and cross-regulatory that are linked to bank merger across borders (Buch and DeLong, 2004). However, for a number of acquirers from markets with already concentrated banking sectors, particularly in small countries, there is little alternative to consolidation across borders (see Berglöf et al., 2005)

4.3 Listed versus Non–listed Banks

One of the advantages of our book value-based measure of takeover premiums is that we can also include a wider range of banking firms than listed banks. We control for whether the target is a listed bank (LISTED). We hold no a priori expectations as regards the effect of this variable on premiums. Listed banks have higher disclosure requirements which may facilitate effective due diligence and could prevent bidders from overpaying for targets. On the other hand, the market for corporate control for listed targets should be more liquid and bidding wars are more likely to drive up acquisition premiums.

The results in Table 6 show that bidders pay a lower premium for listed banks. The difference of 24.9 p.p. is statistically significant in terms of medians. This is consistent with explanations which emphasize that the disclosure stipulations on listed banks increase transparency and lower the probability of bidders overvaluing targets.

4.4 Premiums paid and the regulatory environment

Regulation (regulatory strength, deposit insurance and investor protection) may impact the price that bidders are willing to pay for a target bank in a variety of ways. On the one hand, stricter regulation may facilitate due diligence for bidders and increase their trust in the quality of the target's disclosure practices as well as in the soundness of the target bank in general. On the other hand, stronger regulatory regimes impose higher compliance costs on bidding banks and, in the case of bank regulation, may well restrict managerial discretion—with potential implications for bank profitability in the post-merger period.

The results in Table 6 show that all three regulatory variables help explain differences in the premiums paid by acquirers. Acquirers pay lower premiums for banks in countries with better protection of minority shareholders. This difference is substantial in absolute value and statistically significant both in terms of average and median. Further, bidders pay lower premiums for banks in countries where the strength of the bank regulatory regime is below the median EU level. Along similar lines, stricter deposit insurance arrangements (in terms of the funding and risk-based premiums) also mean that investors pay lower premiums (the difference for regulatory strength and deposit insurance design are statistically significant for median premiums).

The reported results are consistent with the explanation that regulation entails costs for the bidding bank that seem to outweigh any benefits that stricter regulatory frameworks bring about in terms of investor protection and banks´ safety and soundness.

5. Regressions

5.1 Specification

To analyze the factors that determine target bank valuations in a multivariate setting, we estimate the following regression model with heteroskedasticity-robust standard errors:

$$\text{BVPREM}\ (\%) = \alpha + \beta_1 \text{DC} + \beta_2 \text{TC} + \gamma \text{REGULAT} + \varepsilon, \qquad (2)$$

where **DC** a vector of deal characteristics,
TC is a vector of target bank characteristics, and
REGULAT includes regulatory variables.

The deal characteristics include the following variables. CONTROL is a dummy variable indicating whether the deal involves a change in shareholder control of the target bank. As discussed in the previous section, we assume that a change in control takes place when a non-listed bank that owns less than 20% of the target equity increases its shareholding to at least 20% and when a listed bank with an initial stake in the target below the MBR (in the target country) reaches that threshold after the transaction has been completed. CROSSB is a dummy variable that is one if bidder and target are chartered in different countries (and zero otherwise). Market concentration in the target country is measured by a Hirschman-Herfindahl index (HHI) where the market is defined as the country in which the bank is headquartered.[19] All else equal, more concentrated markets may afford higher rents to banking firms which would consequently be prepared to pay higher premiums for acquisitions in more concentrated banking markets (Palia, 1993).

RELSIZE measures the value of the combined bidder and target assets divided by bidder total assets. We employ this measure as an indicator of the easiness to integrate and also as a

[19] Member State's HHI is calculated according to a common methodology as established by the ECB (see ECB banking structures, October, 2006).

proxy of TBTF. Following Benston et al. (1995), we measure potential diversification benefits by the covariance of ROE for bidder and target banks in the pre-merger years (COVROE). A negative sign on this variable would indicate that bidders pay more for targets with greater potential to smooth earnings.

Based on Laeven and Levine (2007), we compute an asset-based measure of how focused banks are on lending as 1-|(net loans-other earning assets)/total earning assets|. ASSETDIV is the absolute value of the difference of this ratio for bidders and targets. Bidders may be willing to pay larger premiums for banks that engage in forms of income other than interest income (i.e fee, dividends and trading income) rather than taking deposits and making loans.

The variables included in the vector of target bank characteristics are averages over the three fiscal years before the deal announcement. We measure target profitability as the return on equity (ROE) and leverage (LEV) as equity divided by total assets.[20] We expect higher values of ROE and lower levels of LEV to attract higher takeover premiums. The riskiness of the target (RISK) is proxied by the standard deviation of ROE in the pre-merger years. TAGRWTH is an asset-based growth measure over three years. A positive sign on the growth variable would indicate a valuation premium associated with targets operating in expanding markets, while a negative sign would signal future asset quality problems linked to growth.[21]

[20] This definition of leverage accords with the bank supervisory use of the term to mean the equity to asset ratio. Note, however, it contrasts with a common definition of leverage in the corporate finance literature where equity is the denominator as in the debt to equity ratio or asset to equity ratio.

[21]This paper does not include the medium of payment in acquisitions (equity versus cash) because our data source appears to contain too many errors.

5.2 Results: Target and Deal Characteristics

Table 7 shows the results of regressions of deal and target bank characteristics on BVPREM. In Column 1, we report the results for the whole sample, whereas in Column 2, we report the results for the subsample of listed targets. The most robust conclusion arising from Table 7 is that operating performance and risk are significantly correlated with takeover premiums, both for the full sample as well as for the sample of listed targets. Thus, we find that higher target profitability (ROE) and lower target leverage (LEV) are associated with higher premiums. Also, acquirers pay less for targets that are riskier (RISK) and whose ROE exhibits a lower covariance (COV) with their own. The later result is consistent both with banks seeking to increase the value of the safety net (deposit insurance put hypothesis) and with focusing mergers generating greater shareholder value. However, the negative coefficient on RISK is inconsistent with trying to increase the value of the safety net, which suggests that the COV result is more likely due to focusing mergers generating greater shareholder value.

The magnitude of these effects is non-negligible. For the full sample (listed sub-sample), a 1 percentage point increase in ROE is associated with a 2% (7%) increase in the average premium paid. The larger effect found for the listed targets might be explained by the stricter transparency requirements imposed on listed companies in terms of schedule and content and audit of their financial statements, which makes their profitability data more reliable from the view point of the acquirer. Further, a 1 percentage point increase in LEV is associated with a 4% and 5% decrease in the average takeover premium for the full sample and sub-sample of listed banks, respectively.

The positive and (weakly) significant coefficient on target growth found for the full sample indicates that acquirer value fast-growing target banks. The coefficient on the squared

growth term (TARGRWTHSQ) is negative (although statistically insignificant). For the sample of listed targets, neither the linear nor the quadratic asset growth terms enter the specification at customary levels of statistical significance.

The effects of deal characteristics on European takeover premiums are far from conclusive. For the full sample, the only significant coefficient is the cross-border dummy (CROSSB). The negative coefficient reported is consistent with bidders facing greater operational difficulties to integrate foreign banks. The coefficients of the remaining deal characteristics are not statistically significant. Deals involving a change in control, thus, do not result in higher premiums than those observed in purchases of minority stakes (even though the coefficient has the expected positive sign). Similarly, takeover premiums are neither related to the legal status of the target (listed vs. unlisted) nor to the degree of market concentration (HHI) in the host country. Further, we do not observe a significant relationship between relative size (RELSIZE) and target valuations. Finally, differences in the degree to which the merging banks engage in lending (ASSETDIV) are not related to takeover premiums.[22]

5.3 Results: Regulation and Takeover Premiums

Table 8 reports the results of regressions that estimate the impact of the regulatory variables for investor protection, deposit insurance, and safety and soundness (regulatory strength) on the takeover premiums paid in European banking.

Concerning the results for the regulatory variables, we do not find a significant effect for the shareholder protection proxy neither for the full sample nor for the listed subsample. However, we obtain negative coefficients for both the deposit insurance and the regulatory

[22] When we replace the ASSETDIV variable with a variable that captures differences in business lines between the merging banks, this new variable turns out to be also non-significant.

strength indices. Both measures are significant for the sample of listed targets, while the deposit insurance proxy is close to significance (p-value=0.11) in the case of the full sample. We interpret this negative relationship between takeover premiums and the regulatory indices as evidence that stronger regulatory regimes as well as risk-based and pre-funded deposit insurance schemes impose higher compliance costs on acquiring banks.

It is interesting to note that the inclusion of regulatory variables into our regression model leaves most of the findings from previous regression specifications unchanged. The estimated coefficients on the risk (RISK) and return (ROE) variable suggest that acquirers are willing to pay higher premiums for more profitable and lower premiums for riskier institutions. In turn, the target growth term (TARGRWTH) is significant for the full sample. Interestingly, the quadratic asset growth term (TARGRWTHSQ) is negative and statistically significant. This result indicates that excessively high asset growth rates may serve as an early indicator of asset quality problems in the future.

As regards the coefficients on the deal characteristics, we find some differences with respect to the results reported in Table 7. For the full sample, the cross-border dummy (CROSSB) is no longer significant. In the subsample of listed banks, we observe a positive and significant coefficient for the control dummy (as defined by the MBR threshold) suggesting that acquirers are willing to pay higher premiums to obtain control, without the existence of mandatory bidding rules preventing them from doing so. Also for the sample of listed banks, a positive and significant coefficient is found for the degree of bank concentration of the target market which indicates that bidders pay a higher premium for targets in these markets, presumably in anticipation of higher rents from market power.

Finally, Table 9 shows the results of the estimation of a specification which allows for a differential effect of the regulatory variables depending on whether the deal is domestic or cross-border.[23] The estimated coefficients for both target and deal characteristics are qualitatively similar to those reported in Table 8. However, the coefficient estimates of the regulatory variables provide interesting insights. We find that the estimated coefficients of both the regulatory strength and the deposit insurance indices are negative and significant, while the corresponding interaction terms are positive and significant (with the exception of the deposit insurance dummy interacted with the cross-border dummy in the full sample equation). These results are consistent with the univariate analysis above and suggest that in the case of domestic deals, stricter regulatory regimes as well as stronger deposit insurance arrangements impose higher compliance costs on acquirers that are reflected in lower premiums. However, in the case of cross-border deals, these regulatory costs are compensated by the potential benefits associated with entry into a market with a stricter regulatory framework. This is consistent with Buch and DeLong (2004) who argue that stricter regulation makes targets more attractive in cross-border deals as a result of increased trust in the disclosure practices.[24] Finally, we do not find a significant effect for the shareholder protection proxy neither for domestic deals nor for cross-border transactions.

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[23] We have also estimated a specification which allows for a differential effect of the regulatory variables depending on whether the target banks belong to a Member State that has only recently joined the EU since 2004 (e.g., Hungary, Poland, Romania). We do not find any differential effect as all the interaction terms are insignificant. Nevertheless, this result might be driven by the small number of targets of those countries.

[24] The estimated effects for the regulatory strength and for the deposit insurance variable indices in the case of cross-border deals are not significantly different from zero. In particular, we cannot reject the hypothesis that the sum of the coefficients of the regulatory strength index and the corresponding interaction term are zero (p-values of 0.93 for the full sample and 0.34 for the sample of listed targets). Analogously, we cannot reject the hypothesis that the sum of the coefficients of the deposit insurance index and the corresponding interaction term are zero (p-values of 0.64 for the full sample and 0.92 for the sample of listed targets).

6. Conclusions and Policy Considerations

A substantial body of research has examined the patterns and performance of bank mergers and acquisitions. To date, this literature has largely focused on the U.S. with only limited evidence outside the U.S. market and very few studies which have examined Europe. While M&A has transformed the size of banking firms and widened the scope of activities they perform in a number of European economies, policymakers have long been concerned that the hitherto slow pace at which bank consolidation takes place in Europe (especially cross-border bank consolidation) runs contrary to the Single Market policy of the EU. In this paper, we analyze the premiums paid in European bank mergers. By analyzing the premiums paid by bidding banks, we are able to draw some conclusions as to the motives behind bank M&A in Europe. The EU offers a unique setting to analyze the extent to which regulatory considerations motivate M&A and are, thus, reflected in the pricing of bank control. This is mainly because the EU high levels of freedom of capital movements coexist with continuing regulatory differences in the form of bank regulation, deposit insurance, and investor protection regimes across individual member states.

Our results show that bidding banks value more profitable and high-growth banks, and pay less for institutions with high equity ratios and high return volatility. In addition, bidders attach a valuation premium to targets that are engaged in similar activities or business segments. We find that stricter prudential regulatory regimes and stronger deposit insurance schemes lower the takeover premiums paid in bank mergers. However, this result, presumably in anticipation of higher compliance cost, is mainly driven by domestic deals. For cross-border deals, the benefits of entering a highly-regulated foreign market appear to offset the expected regulatory costs associated with compliance.

Our results have some policy implication. First, we find no evidence consistent with bidders paying to extract benefits from regulators either by paying a premium for less regulated regimes or by becoming 'too big to fail' in cross border deals. This should be reassuring to regulators as it shows that cross-border bank consolidation in Europe appears to be driven by efficiency rather than by attempts of regulatory arbitrage. Second, stricter bank regulation in the target's country increases target valuations in cross-border as compared to domestic deals. This shows that prudential regulatory regimes can help facilitate the cross-border bank consolidation in Europe. Moreover, it highlights the importance of full harmonization of financial regulation to the highest standards in order to secure a level playing field in an integrated financial market.

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Table 1
Bank Merger Premium Studies

Paper	Sample	Time period	Premium Measure
Adkisson, & Fraser (1990)	174 U.S. takeovers	1985-1986	Book value
Beatty, Santomero and Smirlock	264 U.S. takeovers	1984-1985	Book value
Benston, Hunter & Wall (1995)	302 U.S. takeovers	1981-1986	Market value
Brewer, Jackson, & Jagtiani, (2000)	189 U.S. takeovers	1990-1998	Book value
Brewer, Jackson, & Jagtiani, (2007)	392 U.S. takeovers	1990-2004	Market value
Brewer, & Jagtiani, (2007)	412 U.S. takeovers	1991-2004	Market value
Cheng, Gup and Wall (1989)	135 U.S. takeovers	1981-1986	Book value
Diaz and Azofra (2009)	147 EU takeovers	1994-2000	Book value
Palia (1993)	137 U.S. takeovers	1984-1987	Book value
Rogowski and Simonson	168 U.S. takeovers	1984-1987	Book value
Shawky, Kilb and Staas (1996)	320 U.S. takeovers	1982-1990	Book value

Table 2. Number of deals

Breakdown by country

	Full sample	Deals with listed target	Cross-border deals
Austria	8	5	3
Belgium	3	1	2
Czech Republ	6	4	5
Denmark	7	5	3
Estonia	4	3	3
Finland	1		1
France	25	21	4
Germany	24	16	8
Greece	16	13	4
Hungary	3	1	2
Ireland-Rep	2	2	2
Italy	86	39	7
Latvia	3	2	3
Lithuania	5	5	2
Luxembourg	1	1	1
Malta	3	3	3
Netherlands	2		1
Poland	9	6	7
Portugal	9	7	1
Slovak Rep	4		4
Slovenia	4	4	3
Spain	23	13	4
Sweden	1		
United Kingdc	6	4	2

Breakdown by year

1997	17	12	1
1998	34	18	9
1999	34	27	9
2000	40	29	11
2001	25	16	8
2002	19	10	8
2003	23	10	6
2004	19	8	6
2005	13	6	5
2006	20	11	10
2007	11	8	2
Total	255	155	75

Table 3. Bank regulatory indices

	Regulatory strength	Deposit insurance	Shareholder protection (country avg -1997-2007)
Austria	9	1	19.1
Belgium	9	1	8.0
Czech Republic	7	1	2.9
Denmark	6	1	19.8
Estonia	8	1	.
Finland	8	2	31.0
France	4	2	24.4
Germany	4	2	19.9
Greece	4	1	12.8
Hungary	9	1	13.3
Ireland-Rep	9	1	36.6
Italy	5	1	8.9
Latvia	5	1	21.5
Lithuania	3	1	23.1
Luxembourg	7	0	17.8
Malta	8	1	.
Netherlands	5	0	21.2
Poland	8	1	12.2
Portugal	6	2	21.2
Slovak Rep	7	1	0.9
Slovenia	9	0	.
Spain	7	1	32.0
Sweden	3	2	25.8
United Kingdom	9	0	42.4

Table 4. Premiums (bv_prem) paid by deal characteristics: Control

		Mean	Median		N. obs.
Control (threshold: 10%)	No	136.9	91.9		93
	Yes	160.8	122.3		146
	Difference	-24.0	-30.4	**	
Control (threshold: 20%)	No	139.6	86.2		85
	Yes	158.1	122.3		154
	Difference	-18.4	-36.1	**	
Control (threshold: 30%)	No	133.7	85.6		90
	Yes	162.3	123.1		149
	Difference	-28.6	-37.4	**	
Control (threshold: 40%)	No	146.9	92.3		95
	Yes	154.5	122.6		144
	Difference	-7.6	-30.3	**	
Control (threshold: 50%)	No	161.1	92.3		93
	Yes	145.4	120.9		146
	Difference	15.7	-28.6	*	
Control (threshold: MBR)	No	140.4	92.1		92
	Yes	158.5	122.6		147
	Difference	-18.1	-30.5	**	

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5. Premiums paid (bv_prem) by percentage of ownership in staggered deals

COMPARISON STAGGERED DEALS - CONTROL DEFINED AS 50% OR MORE

	N	mean	p25	p50	p75
Deals involving change in control					
bv_prem	22	191.0	45.8	97.6	153.0
Deals without change in control					
bv_prem	27	191.5	31.7	98.3	169.2

COMPARISON STAGGERED DEALS - CONTROL DEFINED AS 20% OR MORE

	N	mean	p25	p50	p75
Deals involving change in control					
bv_prem	23	247.8	56.6	152.8	344.7
Deals without change in control					
bv_prem	29	196.2	46.2	91.9	169.2

COMPARISON STAGGERED DEALS - CONTROL DEFINED AS 30% OR MORE

	N	mean	p25	p50	p75
Deals involving change in control					
bv_prem	24	254.1	66.4	146.1	278.0
Deals without change in control					
bv_prem	30	185.3	46.2	92.6	169.2

Table 6. Premiums (bv_prem) paid by deal characteristics: Other characteristics

		Mean	Median	N. obs.
Geographical scope	Domestic	145.4	105.3	165
	Cross border	165.2	100.2	74
	Difference	-19.8	5.1	
Listed	No	148.8	122.0	93
	Yes	153.2	97.1	146
	Difference	-4.5	24.9 *	
Regulatory strength	Below median	165.5	106.7	164
	Above median	120.9	85.1	75
	Difference	44.6 *	21.7	
Deposit insurance	0 or 1	150.8	118.0	182
	2	153.8	76.2	57
	Difference	-2.9	41.7 *	
Shareholder protection	Below median	180.5	129.0	139
	Above median	111.2	76.7	100
	Difference	69.2 **	52.4 ***	

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7. Determinants of the premiums paid: Financial variables

Variable	Full sample	Listed
CONTROL	24.138	30.065
CROSSB	-38.982*	-5.065
HHI	0.026	0.028
LISTED	-27.143	--
ROE	1.972***	7.286***
RISK	-1.884***	-1.748***
LEV	-3.931***	-4.708***
COVROE	0.789**	1.500**
ASSETDIV	-4.836	80.036
RELSIZE	7.601	20.172
TAGRWTH	3.050*	-3.163
TAGRWTHSQ	-0.043	0.032
INTERCEPT	141.312***	43.76
N	178	106
r2_a	0.079	0.206
rmse	139.37	131.207

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Dependent variable is the premium of the purchase price over the book value in percentages. The full sample column contains all observations in the sample; the listed column contains those where the target is listed on a stock exchange. The independent variables are: CONTROL = binary variable equal to 1 if the deal involves a change in shareholder control of the target bank, CROSSB = binary variable equal to 1 if the bidder and target are chartered in different countries, HHI = Hirschman-Herfindahl index where the market is defined as the country in which the bank is headquartered, LISTED = binary variable equal to 1 if the target is listed on a stock exchange, ROE = return on equity, RISK = standard deviation of return on equity, LEV = equity divided by total assets, COVROE = covariance of ROE for bidder and target banks in the pre-merger years, ASSETDIV = absolute value of (1-l(net loans-other earning assets)/total earning assets) (from Laeven and Levine (2007)), RELSIZE = sum of bidder and target assets divided by bidder total assets, TAGRWTH = growth rate in target assets measure over the prior three years, TAGRWTHSQ = TAGRWTH squared.

Table 8. Determinants of the premiums paid: Financial and regulatory variables

Variable	Full sample	Listed
CONTROL	30.525	54.587*
CROSSB	-30.914	31.984
HHI	0.030	0.051*
LISTED	-21.716	--
ROE	1.885**	8.661***
RISK	-1.700***	-1.773**
LEV	-4.809***	-6.769***
COVROE	0.883**	1.802**
ASSETDIV	20.134	92.031
RELSIZE	11.197	12.071
TAGRWTH	3.918**	-2.931
TAGRWTHSQ	-0.077**	-0.02
SHPROTECT	-1.123	-1.646
DEP_INS	-41.182	-45.250*
REG_STRENGTH	-12.041	-26.946*
INTERCEPT	261.163***	257.824***
N	171	99
r2_a	0.108	0.313
rmse	135.077	119.11

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Dependent variable is the premium of the purchase price over the book value in percentages. The full sample column contains all observations in the sample; the listed column contains those where the target is listed on a stock exchange. The independent variables are: CONTROL = binary variable equal to 1 if the deal involves a change in shareholder control of the target bank, CROSSB = binary variable equal to 1 if the bidder and target are chartered in different countries, HHI = Hirschman-Herfindahl index where the market is defined as the country in which the bank is headquartered, LISTED = binary variable equal to 1 if the target is listed on a stock exchange, ROE = return on equity, RISK = standard deviation of return on equity, LEV = equity divided by total assets, COVROE = covariance of ROE for bidder and target banks in the pre-merger years, ASSETDIV = absolute value of (1-|(net loans-other earning assets)/total earning assets) (from Laeven and Levine (2007)), RELSIZE = sum of bidder and target assets divided by bidder total assets, TAGRWTH = growth rate in target assets measure over the prior three years, TAGRWTHSQ = TAGRWTH squared.

Table 9. Determinants of the premiums paid: Financial and regulatory variables - Interactions

Variable	Full sample	Listed
CONTROL	31.075	53.337*
CROSSB	-257.193	-232.934
HHI	0.030	0.055*
LISTED	-21.943	--
ROE	1.738**	8.209***
RISK	-1.778***	-2.003***
LEV	-4.937***	-7.180***
COVROE	0.746*	1.757**
ASSETDIV	11.575	80.597
RELSIZE	11.623	13.925
TAGRWTH	3.078*	-3.678
TAGRWTHSQ	-0.055*	0.004
SHPROTECT	0.876	0.848
SHPROTECT*CROSSB	-2.776	-4.195
DEP_INS	-77.669*	-89.033**
DEP_INS*CROSSB	64.429	92.356**
REG_STRENGTH	-34.159*	-52.430**
REG_STRENGTH*CROSSB	34.982*	39.921*
INTERCEPT	396.177***	414.201***
N	171	99
r2_a	0.111	0.318
rmse	134.854	118.7
p-values (Reg.var+interaction)		
t_sharehol~v	0.18	0.07
t_di	0.64	0.92
t_regul_st~h	0.93	0.34

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Dependent variable is the premium of the purchase price over the book value in percentages. The full sample column contains all observations in the sample; the listed column contains those where the target is listed on a stock exchange. The independent variables are: CONTROL = binary variable equal to 1 if the deal involves a change in shareholder control of the target bank, CROSSB = binary variable equal to 1 if the bidder and target are chartered in different countries, HHI = Hirschman-Herfindahl index where the market is defined as the country in which the bank is headquartered, LISTED = binary variable equal to 1 if the target is listed on a stock exchange, ROE = return on equity, RISK = standard deviation of return on equity, LEV = equity divided by total assets, COVROE = covariance of ROE for bidder and target banks in the pre-merger years, ASSETDIV = absolute value of (1-|(net loans-other earning assets)/total earning assets) (from Laeven and Levine (2007)), RELSIZE = sum of bidder and target assets divided by bidder total assets, TAGRWTH = growth rate in target assets measure over the prior three years, TAGRWTHSQ = TAGRWTH squared.