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Diversification, size and risk: the case of bank acquisitions of nonbank financial firms

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ABSTRACT

We investigate the risk effects of bank acquisitions of insurance companies and securities firms between 1991 and 2012 using a newly constructed dataset of M&A deals. We examine risk changes before and after deal announcements by decomposing risk into systematic and idiosyncratic components. Subsequently, we investigate the relationship between risk and diversification by modelling the determinants of risks. We find that bank combinations with securities firms yield higher risks than combinations with insurance companies. Bank size is an important and consistent determinant of risk whereas diversification is not. Our results inform the continuing debate on diversification versus functional separation of bank activities.

JEL classification: G21; G22; G32; G34

Keywords: Banks; nonbank financial firms; financial conglomerates; diversification; risk decomposition; determinants of risk

1. Introduction

This paper contributes to the on-going policy debate on bank diversification versus functional separation by examining the risk profile of international banks following acquisition of non-banking activities. It is little over a decade since the Financial Services Modernization Act (FSMA) of 1999 revoked functional separation to allow US bank holding companies (BHCs) to operate as financial conglomerates. Permitting the so-called "universal banking model" put US banks on equal footing with European banks, which could operate as universal firms under the Second Banking Directive of 1989.[1] The response of the financial services industry came in the form of a wave of consolidation, often via mergers and acquisitions (M&A), through which financial institutions increased the scale and scope of their activities.[2] Large and complex financial institutions were at the core of the 2007-09 crisis. This has triggered a new debate on optimal bank size, focusing either on capital surcharges for large banks (Basel III), or on the range of permissible activities (Volker rule in the US, and Vickers and Liikanen proposals in the UK and EU, respectively).

This reaction has reignited the long-standing debate as to the costs and benefits of diversification (Herring and Santomero, 1990; Boyd et al., 1998; Flannery, 1999; Acharya et al., 2006; Herring and Carmassi, 2010; Elsas et al., 2010). At the public policy level, concerns relate to extended monopoly powers of larger financial firms; conflicts of interest between financial institutions and consumers; and the possibility that nonbank financial firms could implicitly benefit from government subsidies targeted at banks via "too-big-to-fail" guarantees (Farhi and Tirole, 2012; Molyneux et al., 2014; Laeven et al, 2014).

The perceived benefits of diversification include synergies from scope economies, efficiency gains and profit-enhancing cross-selling opportunities (Houston et al., 2001; Pilloff 1996; Vander Vennet, 2002). Furthermore, diversification may allow financial services firms to reduce

[1] The Financial Services Modernization Act (FSMA) of 1999 – also known as the Gramm-Leach-Bliley Act (GLBA) – widened the range of permissible activities for banks. The process of deregulation in US banking began before 1999 with the first step towards thought to have occurred in 1987 when the Federal Reserve allowed Citicorp, Bankers Trust and JP Morgan to engage in limited underwriting and dealing in a set of securities. Several further steps gradually eroded the restrictions of the Glass-Steagall Act. The Riegle-Neal Act of 1994 (Interstate Banking and Branching Efficiency Act) let banks expand across states and engage in geographical diversification. In Europe, the implementation of the Second Banking Directive by all 15 member states was completed between 1991 and 1994.

[2] In addition to financial deregulation, other forces encouraging consolidation in the financial sector during the 1990s and early 2000s included: improved information technology, globalisation of financial and real markets, and heightened shareholder pressure for financial performance. In Europe, the introduction of the euro accelerated the speed of financial market integration and encouraged cross-border activity (Group of Ten 2001).

insolvency risk due to the imperfect correlation of profits arising from a broader set of financial activities. Critics, in contrast, perceive no diversification benefits and instead voice concerns pertaining to the existence of diseconomies of scope and greater inefficiencies at more diverse financial institutions (Laeven and Levine, 2007), which are deemed as more complex, difficult to regulate and harder to resolve (Herring and Carmassi, 2010; Chow and Surti, 2011; Gambacorta and van Rixtel, 2013). Indeed, plentiful evidence shows that substituting interest income with fee-based income increases earnings volatility (DeYoung and Ronald, 2001; Stiroh 2004; Stiroh and Rumble, 2006).

Nonetheless, substantial empirical evidence suggests benefits accrue to diversified institutions relative to more specialised firms (Barth et al., 2000). Although much of the evidence dates from the late 1990s and early 2000s, policymakers appear to endorse this view. This paved the way for an unprecedented level of M&A activity in the financial services industry, which has contributed to the emergence of a number of large and increasingly complex financial institutions.[3]

Following the 2007-09 crisis a growing number of academics and policymakers began to debate if the size and permissible activities of financial institutions should be re-constricted because of concerns over systemic risk. New legislation in the US and Europe now enforces a functional separation of impermissible investment banking activities from commercial banking.[4] Whereas the permissible investment banking activities may differ between the US and across EU member states, and the mechanisms to deliver separation range from institutional separation (in the US) to subsidiarisation (in the EU) to ring-fencing (in the UK), a common objective of

[3] Most M&A activity during the 1990s in the financial sector involved banking firms. Acquisitions of banking firms accounted for 60% (70%) of the total number (value) of financial mergers (Group of Ten, 2001). The asset share of the five largest BHCs in the US jumped from 21.2% to 48.0% between 1986 and 2006 (Stiroh, 2010). The evolution of the mean ratio of non-interest income-to-total operating income, to proxy diversification, shows that the BHCs increasingly diversified over time: from 39.0% in 1986 to 53.2% in 2006. Between these dates, the average BHC operated in more states (21 c.f. 5) and achieved greater branch penetration (3,118 c.f. 463). Berger et al. (1999) and Berger et al. (2001) discuss the consolidation process in the US and Europe.

[4] The principle of the new legislation is to carve out predefined casino-like trading activities of banks. A key difference between the US and European approaches is that the Volcker rule in the US forbids the coexistence of predefined investment banking activities in different subsidiaries within the same banking group whereas the European and UK rules allow for subsidiarisation of such activities in separately capitalised legal entities. In the US, the Volcker rule is implemented in the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. In the UK, the Vickers proposals are implemented in the Financial Services (Banking Reform) Act of 2013. In January 2014, the European Commission published its proposal for a Volcker-Vickers style reform which deviates somewhat from the recommendations of the Liikanen report of 2012. Agreement on the final version of the European legislation is not expected until mid-2015 which infers an effective date of mid-2018. Mayer Brown (2014) review the new European proposal and how it differs from Liikanen and UK and US rulings, as well as overviewing recent French and German legislation.

structural bank regulation is the protection of the real economy and bank depositors from exogenous shocks and contagion effects (Chow and Surti, 2011; Krainer, 2012; Gambacorta and van Rixtel, 2013). Whilst these options demonstrate the objective of policymakers for large banks to transit their business models away from universal banking, the new rules prohibit only specific investment banking activities. Consequently, there is a danger that policy developments will neglect, or at least downplay, the possibility that banks benefit from the diversification of their activities into other nonbank activities, as suggested by the intermediation literature.

The debate on diversification considers different dimensions of bank risk: the first dimension relates to the increase in individual bank risk deriving from increased organisational complexity and involvement in market-based activities. The second dimension relates to a bank's contribution to systemic risk. Regulatory definitions of systemically important banks (SIBs) or systemically important financial institutions (SIFIs) relate to the size, complexity and interconnectedness of the financial institutions.[5]

In a somewhat similar vein, the notion of greater system-wide risks – arising from the broadened scope of banking activities – is gaining ground in both theoretical (Acharya, 2009; Wagner, 2010; Ibragimov et al., 2011;) and empirical contributions (De Jonghe, 2010; Billio et al., 2012; Drenhman and Tarashev, 2013; Fiordelisi and Marqués-Ibaňez, 2013). Post 2008, an evolving literature is tackling how best to estimate systemic risk, using a variety of indicators (Brownlees and Engle, 2012; Acharya et al., 2012; Adrian and Brunnermeier, 2012) and to determine the interconnectedness of systemically-important financial institutions given that events have shown the incremental risk of one institution can impact several others and the economy at large.

The crucial question that remains unanswered concerns the expected impact of diversification upon risk. Proponents of diversification argue that it decreases total risk through a reduction in idiosyncratic risk. Opponents of this view contend that diversification exposes financial institutions to the same shocks, which ultimately could adversely affect the level of financial stability.[6] Both sides of the diversification debate are grounded on solid theoretical arguments.

[5] The Financial Stability Board (2011) defines Systemically Important Financial Institutions as "financial institutions whose distress or disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity".

[6] The diversification debate extends beyond the above arguments. Stiroh (2010) reviews the pertinent literature.

The on-going consultations on the future of banking and the wider financial architecture should take stock of the diversification debate. Regulatory reforms should take account of empirical evidence on the differences between activities that add value for shareholders without posing a threat to system-wide stability, and activities which could threaten financial stability, irrespective of possible benefits to firm shareholders. Failing to do so would not only fail to safeguard the soundness of the financial system but also lead to losses in terms of synergies and impose additional costs on the financial system (Vesala, 2009).

This study contributes to on-going academic and policy debates on the relative merits of diversification. Because of the high risk of a few activities, some believe the financial crisis constitutes evidence that diversification does not reduce overall risk. We posit that not all forms of diversification exert equal effect on the risk profile of financial institutions. We test our hypothesis by identifying the effects on risk deriving from M&A between banks and non-bank financial services, including insurance companies and securities firms.

Our empirical investigation proceeds as follows: we commence by estimating risks for acquiring banks before and after the announcement of M&A deals, in order to formally validate the hypothesis that diversification realizes lower levels of risk. To do this, we decompose [total] risk into systematic and idiosyncratic constituents. Next, we formally examine the relationship between risk and diversification in bank-nonbank partnerships. Specifically, we model the determinants of risks, after controlling for financial institution-specific attributes such as asset quality, profitability, leverage and size. Finally, we assess if the effect on risk is driven by the characteristics of the participating financial institutions. In order to achieve this, we construct three subsets of deals: (1) banks acquiring insurance companies (Bank-Insure); (2) banks acquiring insurance agencies/brokers (Bank-Agency); and (3) banks acquiring securities and/or commodities brokers (Bank-Securities).

Our sample comprises 274 international M&A deals involving banks and nonbanks from 1991 to 2012, making it the most comprehensive dataset in the literature on the risk effects of bank-nonbank takeovers. The sample period includes the major international regulatory changes that should impact on diversification; the implementation of the Second Banking Directive in Europe and the FSMA in the US. By segmenting our sample of deals into pre- and post-2007 periods we demonstrate if, and how, the financial crisis impacted risks in bank-nonbank combinations.

Our main contribution is fourfold. First, we offer broader results on the effects of bank-nonbank takeovers on bidder total, systematic and idiosyncratic risks, thereby extending the extant literature on the risk effects of conglomeration. Second, we provide novel results on the relationship between diversification and risk before and after bank-nonbank deals. To the best of our knowledge, this is the first study to examine this relationship within a cross-sectional framework while controlling for other factors. Third, we distinguish between bank diversification into two types of insurance business (underwriting and brokerage), and also securities business. Fourth, we provide unambiguous evidence of the impact of the financial crisis on the risks associated with diversification.

By way of preview, our findings indicate merger-induced increases in betas for bank-insurance combinations and increases in total (systematic and idiosyncratic) risk for bank-securities deals. The risk increases are driven by deals that took place between 2007 and 2012, arguably reflecting changes in market perceptions on bank diversification. Moreover, banks' choice to diversify into specific non-banking activities seems to depend on banks' pre-announcement profiles. A key finding of our analysis is that pre-announcement differences in bank profiles diminish as banks become more alike following deals. As firms grow more alike they become exposed to the same shocks, thus increasing the probability of simultaneous firm failure and leading to systemic risk (Wagner, 2010). Although our results fail to uncover variations in risk exposures across combinations on the basis of banks' pre-announcement levels of diversification and risk, we note the importance of size, which is corroborated by our cross-section analysis. This seems to lend some support to the view that bank size is a key variable in the definition of systemically important institutions, in line with the findings of Laeven et al (2014). Diversification effects, however, vary across combinations and between pre- and post-announcement periods. Our analysis implies that regulators should differentiate between effects arising from increases in the absolute size of financial institutions, and those arising from diversification of activities. This is consistent with the views of Kane (2000) that the largest banks tend to reap most M&A benefits due to increased market power, wider political influence and greater access to the safety net.

In what follows, section 2 reviews the extant contributions on the risk issues relating to financial conglomerates and considers the empirical evidence. Section 3 presents the sample and methodological framework. We discuss results in section 4 and conclude in section 5.

2. Bank Diversification and Risk

The question of whether financial conglomerates outperform their more specialized counterparts in terms of their risk-return attributes is an issue of ongoing academic research. Generally, proponents of diversification (Benston, 1994; Saunders 1994) cite the existence of synergies through cost and revenue economies of scope coupled with lower bankruptcy risk due to the imperfect correlations of revenue streams from different functional activities. On the contrary, a basic argument against diversification is that investors can diversify away firm-specific risk by constructing efficient portfolios at lower cost (Levy and Sarnat, 1970).[7] While much of the evidence we discuss draws on US studies, we note the emergence of a literature containing evidence from Europe.[8]

Despite the various methodological avenues pursued in the extant literature, the evidence is mixed and the question still remains. This is very apparent when one reviews academic survey evidence on this subject. For instance, Kwan and Laderman (1999) review the effects of combining banking and nonbank financial activities on bank risk and return. They report that securities activities, insurance broking, and insurance underwriting are riskier though more profitable than banking activities, and provide potential for diversification. Berger et al. (1999) draw similar conclusions and suggest that consolidation can help financial institutions to diversify their portfolio risks as well increase their profit efficiency. Berger et al. (2001) review the literature on the effects of consolidation on the efficiency of the European financial services industry. Whilst they acknowledge that consolidation may yield efficiency gains that are mainly attributable to risk diversification, they admit that much of the potential gain could be offset by barriers to consolidation.[9] In a survey of 18 studies, Saunders and Walter (1994) report a lack of consensus as to whether nonbanking activities reduce bank risk (nine studies answer yes, six answer no, while three are inconclusive).

[7] Levy and Sarnat (1970) use portfolio theory to prove that in the absence of synergistic gains and capital cost economies, the diversification benefits stemming from mergers cannot produce economic gains in a perfect capital market.

[8] The empirical research on financial conglomeration comprises, but is not limited to, studies that consider its effects on shareholder value, efficiency, and risk. To keep the task manageable, this section overviews some evidence relating to the risk effects of bank-nonbank deals, without intending to lessen the importance of any studies excluded. See Fiordelisi and Ricci (2011) and Dontis-Charitos et al. (2011) for evidence on efficiency effects and shareholder value effects, respectively.

[9] The barriers include distance, language, culture and implicit rules against foreign institutions.

Like the survey evidence, the empirical record is inconclusive. Data unavailability and/or methodological issues are underlying anomalies. Heggestad (1975) uses variance/covariance analysis at the aggregate industry level. He finds that many nonbank activities are safer than banking, which suggests potential diversification benefits may exist in some nonbanking operations. Others employ a combination of accounting and market data to examine the relationship between BHC risk and diversification into nonbanking. However, the results lack generality: Boyd and Graham (1986) cannot identify a significant relationship between either profitability or risk and nonbank activity.[10] Brewer (1989) fails to uncover evidence of high BHC risk associated with nonbank activity, though he finds a strong negative relation between risk and nonbank activity for high risk BHCs. Using a similar framework, Brewer et al. (1988) report a negative relation between the proportion of nonbank activity and BHC risk.

The earlier literature suffers from two shortcomings. First, in studies covering periods prior to the 1999 FSMA Act, the regulatory model of functional separation limited the range of permissible nonbank activities. Second, aggregated reporting of nonbanking realised a loss of detail in the analysis of risks. Initial attempts to remedy these anomalies include the application of merger simulation techniques. Boyd and Graham (1988) analyse the impact of a hypothetical expansion of BHCs into nonbanking on BHC risk. They suggest that combinations between BHCs and securities firms, real estate developers and property and casualty (P/C) insurance increase both the volatility of returns and risk of failure. Yet, they also find that BHC expansion into life insurance reduces returns volatility and bankruptcy risk. Similarly, Laderman (1999) finds that life insurance underwriting, P/C insurance underwriting or securities underwriting reduce the probability of BHC bankruptcy. Genetay and Molyneux (1998) analyse the impact of on bank risk of UK banks' expansion into mutual and proprietary life insurance. Whereas the combinations did significantly reduce the probability of failure, their effect on risk is ambiguous and the effect on the volatility of bank profitability insignificant.

The practice of randomly selecting pairs of companies without controlling for size can create an unrealistic pairing of large nonbanks with small BHCs. Boyd et al. (1993) and Lown et al. (2000) take account of this problem. The former authors suggest that mergers between BHCs and life or non-life insurance firms can be risk-reducing if the appropriate portfolio weight

[10] The relationship between nonbank share and risk is strong and positive in a sub-period prior to the imposition of tighter BHC regulations.

combinations are chosen, whereas mergers with either securities or real estate companies are likely to increase BHC risk. In contrast, Lown et al. (2000) conclude that mergers between BHCs and either securities firms or property and casualty firms are likely to modestly raise BHC risk. However, mergers between BHCs and life insurance companies lower risk for both firms because of diversification benefits. Other authors adopt a portfolio approach: Allen and Jagtiani (2000) use market data to create "synthetic universal banks" and find that nonbank activities reduce total risk but increase systematic risk.[11] Estrella (2001) claims banking institutions and insurance companies can experience diversification benefits by converging.

The emergence of bank-nonbank combinations and financial conglomerates, in general, following deregulatory acts, paves the way for studies that investigate actual combinations (Nurullah and Staikouras, 2008). Another strand of literature uses market data to examine the risk effects of bank-insurance takeovers, yet fails to yield conclusive results. Specifically, Fields et al. (2007) find no evidence of risk changes for 105 banks and 24 insurers. Chen and Tan (2011) examine changes in bidder total and systematic risk (beta) for 72 bank-insurance deals and confirm the result.[12] In contrast, Elyasiani et al. (2014) investigate the risk-return and spillover effects of 82 bank-insurance deals and observe a decline in risk for bank acquirers and their peers. Whereas studies examine the relationship between measures of bank diversification and performance, and/or risk, the expected benefits of diversification for financial firms are not always evident, and when benefits accrue they may be offset by other factors. Using non-interest income share to proxy diversification, Stiroh (2004) finds diversification is associated with more volatile and lower risk-adjusted returns at banks. Whilst Stiroh and Rumble (2006) report diversification benefits for BHCs, they acknowledge the offsetting impact on risk-adjusted returns of greater exposure to more volatile activities. Stiroh (2006) confirms the association between diversification and an increasing volatility of returns at BHCs, which implies that some banks may be overly diversified. In a study of European banks, Baele et al. (2007) find diversification (non-interest revenue share) is positively associated with systematic risk, but contrary to Stiroh (2006), they report a negative relationship between diversification and

[11] The term synthetic describes universal banks that do not exist but are created for study purposes. A “synthetic universal bank” is effectively a portfolio consisting of one depository institution, one securities firm, and one insurance company.

[12] Bidder total risk is proxied by the ratio of the variance of bidder returns to the return variance of three indices, namely the world index, the home market index and the home banking index. Bidder betas are calculated using each of the aforementioned indices.

idiosyncratic and total risks. Further scrutiny reveals the latter relationship to be non-linear. Other European evidence supports Stiroh (2006): a study of small European banks finds diversification and risk-adjusted performance are inversely related, inferring that small banks should focus on activities in which they hold comparative advantage (Mercieca et al., 2007). Vallascas and Hagendorff (2011) show that low-risk European banks which diversify into other financial activities (mainly insurance) experience a marked increase in default risk.

3. Data and Methodology

We consider the effect of bank diversification into the insurance and securities businesses on the risks of acquiring institutions. Our sample of deals includes 218 bank-insurance deals and 54 bank-securities deals listed on the Thomson One Banker M&A database between 1991 and 2012.[13] We create two subsets of the bank-insurance sample because the literature on the interface between banks and insurance companies highlights significant differences in the risk-return profiles of banks between combinations with insurance agencies/brokers and insurance firms (Boyd et al., 1993; Dontis-Charitos et al., 2011; Nurullah and Staikouras, 2008). Failing to differentiate between deals when the target is an insurance underwriter – and exposed to underwriting risks – and deals where the target is an insurance agent/broker – where underwriting risk is not present – can bias results. We define the subsets as follows: Bank-Insure contains banks that acquire insurance companies (n = 125); Bank-Agency contains banks that acquire insurance agencies (n = 93). Lastly, Bank-Securities contains banks that acquire securities firms and/or commodities brokers (n = 54). Table 1 shows the distribution of the sample of bidders and targets by country and deal type. Figure 1 shows sample composition by year and deal type.

[INSERT TABLE 1 AND FIGURE 1 HERE]

Table 1 shows the majority of partnerships concentrate in the US and Europe. Whereas bank acquisitions of insurance companies (Bank-Insure) are evenly distributed, distinct geographical features exist: bank acquisitions of insurance agencies (Bank-Agency) occurring mostly in the

[13] This sample represents all available international M&A announcements where banks acquire insurance companies, insurance agencies and securities firms recorded by official wire services between 1991 and 2012, excluding deals that involve rescue motivations and/or have incomplete/unavailable stock return data. We source deal information from the Thomson One Banker M&A database and verify dates using Bloomberg's corporate calendar. A list detailing the deals is provided in Appendix Table A1.

US, with bank acquisitions of securities firms (Bank-Securities) exhibiting greater geographical spread. Most deals occur between 1997 and 2005.[14]

3.1. Decomposition of Risk

To gain insight into the risk effects for each type of deal, we utilise a risk decomposition approach and decompose the total risk facing acquiring firms into its systematic and idiosyncratic constituents. Starting from a generalised multi-factor model, and using a matrix structure, we obtain the linear return generating process for each firm i:

$$R_{it} = \alpha_i + B_i' F + \varepsilon_{it} \quad [1]$$

where R_i is the logarithmic return on asset i; a is the constant term; B is a kx1 vector of exposures (β_{pi}, $p=1,\ldots,k$) of asset i to k common risk factors; F is the k-dimensional column vector of risk factors (f_p); ε_{it} is a residual term with the usual properties and is uncorrelated to the k risk factors; and t equals time. Under this framework, the systematic return variation of asset i is:

$$\sigma^2_{Sys\,R_i} = \sum_{p=1}^{k} \sum_{q=1,\ p\neq q}^{k} \beta_{pi}\,\beta_{qi}\,\sigma(f_p\,f_q) + \sum_{p=1}^{k} \beta^2_{pi}\,\sigma^2(f_p) \quad [2]$$

where $\sigma(f_p\ f_q)$ is the covariance among risk factors p and q. Given that we employ a single index market model[15], asset's i systematic variation to market risk boils down to k = 1 in equation [2]:

$$\sigma^2_{Sys\,R_i} = (\beta_{m_i}\,\sigma_{m_i})^2 = \sigma^2_{R_i} - \sigma^2_{\varepsilon_i} \quad [3]$$

where, $\sigma^2_{R_i}$ and $\sigma^2_{\varepsilon_i}$ are the total and idiosyncratic exposures of asset i, respectively.

We estimate equation [1] for a pre-announcement period (day -250 to day -1) and a post-announcement period (day +1 to day +250) separately, using daily stock prices for acquiring institutions and the stock market index where each acquirer is traded. We source data from

[14] Prior to the FSMA in 1999, a number of US deals took place under specific regulatory permissions. Ten deals that fall into this category are included in the sample. Further information is available upon request.

[15] We also use an extended version of the model including a proxy for interest rate risk. For the majority of financial institutions in our sample the interest rate coefficient is statistically insignificant. Estimates and significance are largely unaffected under the extended model.

Thomson Datastream for periods of 251 trading days before and 250 trading days after each M&A announcement.

3.2. Determinants of Risk

Our next step is to examine the relationship between diversification and bank risk. To achieve this, we estimate equation [4] within a cross-sectional framework to assess the determinants of risk measures in the pre- and post-announcement periods. We build upon the risk decomposition results and employ total, systematic, and idiosyncratic risks as dependent variables:

$$Y_{j,i} = \alpha + \beta_1 DIV_{k,i} + \beta_2 LL_{h,i} + \beta_3 ROA_i + \beta_4 LEV_i + \beta_5 Size_i + \varepsilon_\iota \,, \qquad [4]$$

where, $Y_{j,i}$ is a market-based measure of risk j (systematic risk, measured by the market beta, β, idiosyncratic risk, $\sigma^2_{\varepsilon i}$, or total risk, $\sigma^2 R_i$) for company i.

A combination of theory and empirical evidence influences our choice of risk determinants. We proxy diversification (DIV) using the percentage of non-interest income-to-total operating income (Baele et al., 2007). We also use the percentage of loans-to-assets as an alternative proxy for diversification. However, one may argue these measures are limited because they could be highly correlated with loan-related risk. For robustness, we also construct a Herfindahl-type index of diversification (see, Stiroh and Rumble, 2006; Berger et al, 2010a) and re-estimate all models using this. In addition, we test for a non-linear relationship between non-interest income and risk by introducing the squared non-interest income share term in the regressions.[16] Section 2 noted that the empirical literature does not yield a precise expectation of the sign of the relationship between diversification and risk. LL is proxy for loan-related risk (Acharya et al., 2006; Berger et al., 2010b). We measure loan risk through three indicators: the percentage of non-performing loans-to-total assets; the percentage of loan loss provisions-to-total assets; and the percentage of loan losses-to-total assets. We expect a positive sign on the coefficient of LL with respect to idiosyncratic risk to signal that firms are bearing an increasing exposure to firm-level risk. ROA, LEV and Size are control variables capturing profitability (return on assets; ratio of net income-to-assets), leverage (ratio of total assets-to-common equity), and size (natural

[16] See Section 4.2.1for details.

logarithm of total assets). Finally, ε_t, is the error term with the usual properties.[17] We source balance sheet, income statement and deal-specific data from Thomson One Banker, and lag all independent variables one year with respect to risk measures to mitigate possible endogeneity.[18]

As a robustness test, we re-estimate the models using the completion date for each deal instead of the announcement date. We also re-estimate the models for pre- and post-announcement periods within a single equation by employing an interaction binary variable; DB, is equal to one before an announcement and zero otherwise. In both cases the results remain quantitatively similar (available upon request from the authors).

4. Empirical Findings

4.1. Risk Decomposition: Univariate analysis

This section gauges the impact of M&A announcements on the risk profiles of acquiring banks and identifies the shifts in total, systematic and idiosyncratic risks between pre- and post-announcement periods. In what follows, we present the results from the three types of combinations and discuss any possible variations in risk adjustments before and after the announcement of deals (Section 4.1.1). Subsequently, we present the results from different subsamples (Sections 4.1.2 and 4.1.3).

4.1.1. Full Sample

Table 2 reports the results of the risk decomposition exercise for each type of deal. We present results for the full sample (1991-2012) and for deals pre- and post- 2007. Panels A and B decompose total risk into pre- and post- deal announcement periods. Panel C reports changes in the variables between the two periods.

[INSERT TABLE 2 HERE]

First, we analyse Bank-Insure deals (columns two to four). The full sample results show that the mean market beta (β) significantly increases from 0.846 to 0.901 (by 6.52%, see Panel C). The increase in beta accords with expectations: as both market concentration and average firm

[17] To conserve space, we only report the results for one DIV indicator (non-interest income-to-total operating income) and one LL indicator (loan loss provisions-to-total-assets). The results using alternative proxies are qualitatively similar and are discussed in the paper (detailed tables are available upon request; similarly for the total risk regressions).

[18] Specifically, we source balance sheet and income statement variables at year-end prior to and after each announcement.

size increase due to M&A, the equities of these larger firms will tend to approach the total market basket; therefore, betas move closer to one. The literature documents that large and diversified banks holding relatively high shares of non-interest income, exhibit systematically higher market betas, implying that they bear higher systematic risk (Allen and Jagtiani, 2000; Baele et al., 2007; Stiroh, 2006). Shifting focus to the sources of risk, total return risk ($\sigma^2_{R_i}$) in the pre-announcement period is 4.423; systematic and idiosyncratic risk account for 34.79% and 65.21% of total risk, respectively. The effect of M&A announcements triggers an increase in total risk to 4.773 (by 7.90%). However, the increases in systematic ($\beta^2\sigma^2_{R_m}$) and idiosyncratic risks are statistically insignificant. Turning to deals before and after 2007 (columns three and four), those that occurred pre-2007 did not produce any significant changes in risk for acquiring banks. In contrast, we find significant increases in beta, systematic and idiosyncratic risks at acquiring banks post-2007.

Shifting focus to Bank-Agency combinations in the full period (columns five to seven) the mean market beta significantly increases after deals from 0.618 to 0.726 (by 17.54%, see Panel C). The increase accords with claims that larger and more diversified banks exhibit systematically higher betas. Although combining insurance agencies raises acquiring banks' total and systematic risks, whilst reducing idiosyncratic risk, the changes are insignificant.[19]

For Bank-Securities combinations (columns eight to ten) we note an insignificant increase in the mean market beta from 0.979 to 1.018 following announcements. However, and in terms of total risk, banks bidding for securities firms experience a significant increase of 38.45% (Panel C), which is driven by significant post-announcement increases in systematic (by 59.68%) and idiosyncratic risks (by 24.18%). Comparing separately the pre- and post-2007 periods reveals a complementary set of results for each type of combination. Before the crisis, deals did not significantly affect total risk or systematic risk irrespective of whether banks were combining with either insurance or securities firms. However, the post-2007 results demonstrate an unambiguous shift in the risks of acquiring banks as we find significant increases in systematic and idiosyncratic risks for bank-insure and bank-securities combinations.

Overall, the full period results show that bank betas increase significantly for both types of insurance combinations though not for bank combinations with securities firms. However, we

[19] Note that we do not offer a discussion of the pre- and post-2007 results given that only one deal in this sample occurs after 2007.

find a significant increase in total risk for Bank-Securities whereas the observed increase for bank and insurance combinations is insignificant. Before the crisis, bank combinations with insurance companies and insurance agencies was risk-reducing (albeit, insignificantly), whereas bank combinations with securities firms significantly lowered idiosyncratic risk. Post-2007, we note the magnitude of the increases in total risk for all combinations, albeit significant only for bank-securities. The results partially accord with Boyd et al. (1993) and Lown et al. (2000) who suggest that bank combinations with insurance firms are superior to combinations with securities firms in terms of impacting risk. One interpretation of the variation in results if we consider separately the pre- and post-2007 deals is that the crisis might have altered market perceptions on bank diversification (Elyasiani et al., 2014).

Another plausible explanation for the variation in results across combinations could be that acquiring banks self-select the type of combination they desire, which might reflect fundamental differences in terms of their pre-announcement degree of diversification, risk or size.

Table 3 shows summary statistics and t-statistics for tests of the difference of means across combination pairs. Panel A confirms the existence of some differences in the pre-announcement profiles of acquiring banks. The average bank that acquires a securities firm is significantly larger, and more highly levered and diversified than either insurance combination, hence their higher beta and lower idiosyncratic risk exposure. Focusing on the two types of insurance targets, on average, banks which acquire insurance companies in comparison to insurance agencies tend to be significantly larger, more highly levered and diversified, and achieving better asset quality. That the average bank in Bank-Agency is smaller and less diversified explains their high idiosyncratic risk and lower beta.

[INSERT TABLE 3 HERE]

The post-announcement statistics suggest that banks in each subset are becoming more alike. In particular, the pre-announcement variation in total and systematic risk fades away. Although the average bank betas remain statistically different across combinations in the post-announcement period, their absolute values are converging. This is expected given that we also observe some degree of post-announcement convergence in their degree of diversification and size.

4.1.2. Pre-announcement bank characteristics

The above results indicate the effect of deal announcements on the average risk of banks in each subset. Each combination contains banks located in different geographical areas and/or banks with distinct accounting profiles. Previously, we noted that low-risk and large European banks experience an increase in default risk after merger announcements (Vallascas and Hagendorff, 2011). Therefore, we determine if the post-announcement changes in risk vary according to pre-announcement characteristics of acquiring banks. To investigate this possibility we split the banks in each subset by their pre-announcement levels of diversification (Table 4, Panel A, non-interest income share), risk (Panel B, total risk ($\sigma^2_{R_i}$)) and size (Panel C, natural logarithm of total assets); second we segment the sample into US and EU deals (Table 5).

[INSERT TABLES 4 & 5 HERE]

We begin by examining the effects of the degree of prior diversification (Table 4, Panel A). For each type of combination, we note the absence of any significant differences in risk changes between high- and low-diversification banks. The lack of variation in risk profiles suggests that the pre-announcement diversification level is unimportant. However, for low-diversification Bank-Agency and Bank-Securities partnerships we observe significant increases in systematic risk following announcements. Whereas the increase in systematic risk is offset by a significant reduction in idiosyncratic risk for Bank-Agency partnerships, it drives a significant increase in total risk for Bank-Securities partnerships. All high-diversification banks realise a significant increase in beta following announcements.

Next, we consider the effects of the degree of pre-announcement risk (Table 4, Panel B). Again we fail to uncover evidence supporting the proposition that initial differences in risk at acquiring banks affects developments in risk profiles. The risk components of high-risk banks bidding for insurance companies and agencies remain largely unaffected following deals. On the contrary, low-risk banks in these subsets exhibit significant increases across risk components (except systematic risk for Bank-Agency). Pre-announcement risk is largely irrelevant for the Bank-Securities subset although both high- and low-risk banks show an increase in systematic risk. Nonetheless, and in contrast with Vallascas and Hagendorff (2011), tests show pre-announcement risk does not realise significant differences among high- and low-risk subsets.

In Panel C we examine if post-announcement risk varies with pre-announcement size. For Bank-Insure, small banks experience significant changes in systematic risk and beta. On the contrary, large banks experience changes in risk for Bank-Securities. Lastly, pre-announcement

size is irrelevant for Bank-Agency as beta increases for small and large banks. Further tests on the differences in risk changes across high- and low-sized banks (except Bank-Agency) corroborate the results – the changes in risk between the high- and low-sized banks are statistically different for both Bank-Insure (beta) and Bank-Securities (systematic risk).

The international nature of our sample lets us test if bank geography is driving the results on risk. Table 5 decomposes risks for combinations occurring in the US and the EU.[20] For Bank-Insure deals, US banks experience significant increases in systematic risk and beta following announcements whereas the risk profile of EU banks is unaffected. Beta significantly increases for US and EU banks that bid for insurance agencies following deals. However, we note the magnitude of increase in total risk for Bank-Securities deals that is significant for US banks and driven by larger idiosyncratic risk. In contrast, higher systematic risk drives the (albeit insignificant) increase in total risk for EU banks. The observed cross-border differences may be due to the fact that US banks bidding for insurers are smaller in size than their EU peers and, consistent with our results on size, exhibit higher betas in the post-announcement period.

Thus far, our analysis considers the risk effects of different combinations as well as the timing of deals, pre-announcement characteristics, and bank geography. Nonetheless, the univariate results may not fully capture the drivers of risk changes. To shed more light on our findings, we report on risk determinants, before and after announcements, from a multivariate setting.

4.2. Determinants of Risk: Cross-section analysis

Equation [4] models the relationships between risks and indicators of diversification, loan risk, profitability, leverage and size within a cross-sectional framework. As risk is sensitive to the nature of the operations of target institutions, we estimate separate equations for each combination before and after deal announcements. Table 6 reports the results from separate estimations of equation [4] when market beta (Panel A) and idiosyncratic risk (Panel B) are the dependent variable.

4.2.1. Type of deal

We first consider the results pertaining to market betas. For the pre-announcement period we find a highly significant, positive relationship between beta and diversification (the proxy is non-

[20] We elect not to report results for the remaining countries in our sample because the high degree of heterogeneity across bidder countries outside of the US and EU makes comparisons problematic.

interest income share) which holds for each deal type. In effect, banks that rely more on non-interest sources of income face higher exposure to market-wide shocks, and consequently realize higher market betas. Our finding complements Baele et al. (2007) who report similar results in the context of bank diversification (though not within the context of bank-nonbank mergers), and Allen and Jagtiani (2000) who find nonbank activities increase bank systematic risk. Firm size exerts a significant effect on beta for all combinations, which accords with expectations that larger firms tend to capture a greater share in the total market basket, and hence, realize systematically higher betas. Whereas leverage is positively associated with beta for Bank-Insure, supporting claims that riskier firms (with high leverage) tend to have systematically higher betas than unlevered firms,[21] the result does not hold for other combinations. This confirms our previous observation that banks in each subset exhibit fundamental differences across many dimensions.

[INSERT TABLE 6 HERE]

Post-announcement, the significant relationship between beta and diversification dissipates for combinations involving insurance firms, though retaining significance for Bank-Securities deals. A plausible explanation for this finding could be that insurance activities bring about the desired diversification effects. Specifically, it is possible that the additional non-interest income accruing from insurance activities helps to lower systematic risks and the insignificant relationships we observe post announcement simply reflect this. In contrast, additional non-interest income from securities business may not yield diversification benefits. This outcome also sheds additional light on the full period results in Section 4.1, where we find that beta increases post announcement for Bank-Insure and Bank-Agency. We suspect this increase in risk does not relate to a higher non-interest income share arising from insurance activities per se, but relates to other factors like bigger size; in support of this argument we note the positive and significant post-announcement size coefficients.

In contrast to pre-announcement, and for insurance combinations only, the coefficient on the asset quality indicator (loan loss provisions ratio) turns significant. This indicator can be interpreted as an ex-ante measure of the actual losses from lending activities (Berger et al., 2010b). However, provisioning can be used to smooth earnings across accounting years;

[21] Baele et al. (2007) draw similar conclusions. They find an inverse relationship between beta and the capital-to-assets ratio and contend that a higher degree of capital adequacy lowers systematic risk.

therefore, the market interpretation of its magnitude could depend on firm-specific and macroeconomic conditions. We note a significant yet inverse relationship between profitability (ROA) and beta for Bank-Insure. One explanation lies in the relationship between ROA and leverage: holding ROE (return on equity) constant, the higher the leverage, the lower the ROA and vice-versa. Therefore, a negative relationship between ROA and beta can be explained if lower ROA stemming from higher leverage leads to higher risk exposure, and as noted, higher systematic risk.

Panel B shows the results from the idiosyncratic risk regressions. Pre-announcement, we observe a significant inverse relationship between idiosyncratic risk and diversification for each type of bank-insurance combination, which holds only for Bank-Agency post-announcement. This is consistent with claims that, although income diversification is expected to reduce idiosyncratic risk, an overreliance on non-interest income can produce an opposing effect (Baele et al., 2007; Stiroh, 2006). To contextualize this argument, as noted before, banks that bid for insurance underwriters are more diversified than banks bidding for insurance agents, hence the variation in the results. An alternative explanation might be that the additional income from insurance brokerage plays an important role in reducing exposure to idiosyncratic risk. This is consistent with arguments elsewhere like Nurullah and Staikouras (2008), suggesting that insurance brokerage does not significantly affect the risk of banking firms. Furthermore, the significant, negative coefficient on size verifies the presence of size-related decreases in idiosyncratic risk, and corroborates previous findings; for instance, Baele et al. (2007) and Stiroh (2006). The insignificant result for Bank-Securities confirms our earlier result on beta and supports the notion that securities business is more systematic in nature.

The negative and significant size coefficients before and after deals for Bank-Insure and Bank-Agency complies with expectations of too-big-to-fail guarantees, and/or scale related synergies. Delis and Staikouras (2011) report a negative relationship between bank size and risk, which corroborates our result.[22] Another plausible explanation obtains from Wilson and Williams (2000). They find smaller EU banks experience more variable growth than larger banks and suggest the latter can exploit diversification advantages through off-balance sheet activities,

[22] Delis and Staikouras (2011) measure bank risk using the Z-score (higher values indicating lower risk) and report a positive relationship between risk and bank size. They suggest large banks are more profitable and, hence, less risky, because of economies of scale and/or market power.

enabling them to smooth fluctuations in growth. This might explain the estimated sign for size, since banks that exhibit less volatile growth patterns should bear less idiosyncratic risk.

In unreported regressions, we re-estimate equation [4] using two alternative proxies for the level of diversification. First, we replace the non-interest income share ratio with a Herfindahl-Hirschman (HH) type index of diversification (see Stiroh and Rumble, 2006). Second, we employ the loans ratio which we measure as the ratio of loans-to-assets. The coefficients on HH confirm the earlier results for non-interest income share which is unsurprising given both measures derive from bank income statements. We construct the loans ratio using balance sheet information. The findings indicate loan-intensity is associated with systematically lower betas for Bank-Insure and Bank-Securities although significance varies across periods. For Bank-Agency deals, we observe a significant, positive relationship with beta in each period. In contrast, a lack of significance generally characterises the relationship between the loans ratio and idiosyncratic risk.[23] The exception is Bank-Agency for which market perceptions shift and the coefficient turns significant in post-announcement. In effect, the additional risk element which might stem from raising loan intensity is not being priced by the market, perhaps due to the fact that investors expect that credit risk is offset by diversification into insurance brokerage. This result partially contrasts Barros et al. (2007) who report that bigger and more diversified EU commercial banks are less likely to perform well and more likely to perform poorly, as opposed to small and loan-intensive banks. For robustness, we also test for the presence of a non-linear relationship between the risk factors and diversification by adding the squared term of non-interest income share in the regression equations. The quadratic non-interest share coefficient remains insignificant across specifications, while our existing results remain consistent.[24]

4.2.2. Bank characteristics and risk

Section 4.1 highlights some variations in the univariate results across subsamples. Therefore, we conduct a number of tests to evaluate if bank characteristics, such as, pre-announcement levels of bank diversification, (total) risk and size are important determinants of pre- and post-announcement risk estimates, while controlling for other factors. To achieve this, we augment Equation [4] with three intercept dummy variables to account for high and low pre-

[23] See footnote 16.
[24] Details of the model and the coefficient estimates are available upon request.

announcement levels of diversification (DD), risk (DR) and size (DS), respectively.[25] Table 7 presents results for the augmented model when the dependent variable is beta (Panel A) and idiosyncratic risk (Panel B).

[INSERT TABLE 7 HERE]

Generally, the level of diversification does not impact beta or the idiosyncratic risk of acquiring banks in the pre-announcement period (bar the single exception for Bank-Insure for idiosyncratic risk). The coefficients on DD demonstrate that highly diversified banks which acquire insurance agencies and securities firms experience systematically higher betas than low diversification banks post announcement. This corroborates our previous findings (see Table 4); however, after controlling for other factors, the addition of insurance underwriting to highly diversified banks does not affect beta, and the significant relationship with idiosyncratic risk dissipates post-announcement.

The pre-announcement level of (total) risk does not exert a causal effect on beta in the periods before and after announcements and across combinations. In contrast, high-risk banks exhibit significantly higher levels of idiosyncratic risk, relative to low-risk banks, both before and after announcements and for all combinations, controlling for other factors.

We find that bigger banks which acquire both types of insurance firm realise significantly lower betas in the pre-announcement period only. Thus, the acquisition of insurance business erodes the observed pre-announcement benefits of larger size. For bigger banks participating in Bank-Insure deals the result on beta is offset by a significant pre-announcement increase in idiosyncratic risk. Aside from this solitary finding, the relationship between firm size and idiosyncratic risk is insignificant. Finally, the results on the other coefficients are qualitatively similar to our main findings (see Table 5).

4.2.3. Bank characteristics, covariates and risk

DeYoung et al. (2009) document that bank size is a central aspect of mergers and acquisitions. Size confers, among other things, management quality, market power, political influence, the

[25] The dummy variables equal one if banks register a high (above the median) pre-announcement level for each measure and zero otherwise. Additionally, we employ an expanded specification to control for any effects which could be driven by the geographical characteristics of deals. The augmented model specifies a cross-border dummy equal to one for cross-border deals and zero otherwise, and a US-bidder dummy variable equal to one when the bidder is located in the US and zero otherwise. Their coefficients are insignificant in all cases. Detailed results are available upon request.

extent of access to safety net provisions, as well as established relations with profitability, efficiency and risk. In the context of the present analysis, the relationships between firm-specific performance indicators and risk factors might vary with bank size for different factors. For instance, one could reasonably expect to observe differences in the composition of balance sheets between large and small banks both before and after the completion of deals. Larger banks are more likely to generate a higher proportion of total operating income from non-traditional sources of earnings, as well as exhibiting differences in loan portfolio composition, leverage and profitability. Similarly, the relationship between aspects of firm performance and risk could also vary according to the levels of bank risk and/or degree of bank diversification.

In order to control for any possible effects arising from the pre-announcement levels of size, risk and diversification, we augment equation [4] as follows. In separate re-estimations of the determinants of risk, the binary indicators of (a) large and small (DS); (b) high-and low-risk (DR); and (c) high- and low-diversification (DD) are interacted with each covariate. Tables 8 to 10 show the results using the interactions for size, risk, and diversification.

Table 8 shows the effect of pre-announcement bank size on relationships with beta and idiosyncratic risk. The coefficient on non-interest income share in the augmented regression indicates the relationship between (the pre-announcement level of) diversification and risk for small banks. For small banks that acquire either type of insurance company, we observe a positive and significant relationship with beta and an inverse relationship with idiosyncratic risk before deals. For small banks, the significant relation between diversification and beta is robust for Bank-Agency deals. We observe a positive relationship between diversification and both beta and idiosyncratic risk for small banks that acquire securities firms, though significance dissipates after completion. We find significant differences in the effect on risks arising from differences in the pre-announcement levels of diversification between large and small banks. For large banks, diversification lowers beta both before and after Bank-Agency deals. In Bank-Insure deals diversification increases (lowers) beta (idiosyncratic) risk for large banks relative to small banks in the pre- (post) announcement period. For Bank-Securities deals, diversification yields both types of risk benefits albeit only in the pre-announcement period.

Table 9 shows the results conditioned on the pre-announcement level of bank risk. For low-risk banks, diversification is positively associated with higher beta in Bank-Agency and Bank-Securities deals pre-announcement. The impact of diversification is significantly different

between high-risk and low-risk banks in Bank-Securities deals in the pre-announcement period. In contrast, for low-risk banks we find an inverse relationship between diversification and idiosyncratic risk for Bank-Agency deals both before and after deals. In the case of Bank-Insure combinations, diversification produces idiosyncratic risk-reducing effects for both low-risk and high-risk banks. The augmented results conform to our earlier findings (see Table 6).

[INSERT TABLES 8, 9 & 10 HERE]

Finally, Table 10 shows the results when the conditioning factor is the pre-announcement level of bank diversification. Non-interest income share registers insignificant relationships with betas across each subset and period (bar Bank-Agency pre-announcement). The idiosyncratic risk regressions infer that low-diversification banks bidding for insurance agencies achieve non-interest income share-related diversification benefits following deals. Yet, the benefits in terms of lowering idiosyncratic risk exposure for high-diversification banks is significantly less than the benefits accruing to low-diversification banks.

5. Conclusions

This article examines the risk profile of international banks after acquiring insurance companies and securities firms. The results can inform the debate on bank diversification versus functional separation. Important questions relate to whether the benefits of bank diversification into non-banking outweigh the costs; if the type of combination realises a differential effect; and if size matters. The benefits include potential diversification gains and cross-selling opportunities, which can help to maximize profits by realizing new revenue streams. A possible downside is formerly segmented businesses now face common shocks, which raises systematic (and total) risk.

The academic literature offers inconclusive evidence on the risks associated with financial conglomeration and to risks arising from bank and nonbank combinations. To address this we decompose risk to determine the direct effects of bank mergers with insurance companies and securities firms on the total, systematic and idiosyncratic risks of acquiring institutions. Our analysis extends previous work on bank mergers as follows. First, we construct a large sample of deals over an extended time period including the 2007-09 crisis. Hence, we investigate if the crisis precipitated perceived changes in risks after bank mergers. Second, since risk appears sensitive to the business operations of target institutions, we provide separate results for bank

mergers with insurance underwriters, insurance agencies, and securities firms. Previous studies on M&A and risk aggregate diversifying mergers thereby failing to control for target type which potentially biases results. Furthermore, we examine if the effects on risk vary with the pre-announcement size, levels of diversification, risk and geography of acquiring banks. Our findings link market measures of risk and accounting measures of diversification, loan risk, profitability, leverage and size. We test for shifts in these relationships after deal announcements to determine if diversification yields a comparative advantage in terms of risk conditioned by the type of target. Thus, we offer new insights on bank diversification into non-banking, with results that apply to all stakeholders.

Our results are summarized as follows. We find that bank acquisitions of securities businesses increases total risk through higher levels of systematic and idiosyncratic risks. In contrast, bank acquisitions of insurers (underwriters and agents) realise an increase in betas. On the basis that risk increases after deals announced between 2007 and 2012, we suggest the crisis has made markets wary of bank diversification. Our evidence demonstrates fundamental differences across the risk profiles of acquiring banks, which infers banks self-select to diversify into particular nonbank activities. Nevertheless, our evidence shows banks become more alike after deals. Indeed, we fail to uncover evidence in support of the proposition that highly diversified or risky banks experience different post-announcement effects compared with less diversified/risky peers in the same subset of deals. We do find, however, that the changes in risk between the high- and low-sized banks are statistically different for Bank-Insure (beta) and Bank-Securities (systematic risk).

The cross section results unambiguously show size exerts a significant effect across periods and subsets. We contend the increased risk in both types of bank-insurance combination relates not to diversification in the form of a larger non-interest income share arising from insurance activities per se, but emanates from other factors like absolute size. The results offer interesting insights into the effects of bank pre-announcement characteristics such as size, levels of diversification and risk on the relationships between covariates and risk.

Our empirical evidence offers some interesting conclusions that can inform the debate on bank diversification into non-banking. First, ongoing and future reforms should distinguish the types of bank diversification. The fact that bank combinations with securities firms increases risk augurs in support of the US and European decision to legislate for the functional separation of

banks. In comparison, bank combinations with insurance companies would appear to pose fewer risks to universal style banks. Second, the characteristics of diversifying banks should also be considered. Although the choice of target activity may reflect the strategic goals of acquiring banks and may lead to desirable combinations from the perspective of participating banks, policymakers should carefully monitor the effects of these deals on banks' risk profiles. This is especially important given the positive relationship between systematic risk, default probabilities and systemic risk (Tarashev et al., 2010), coupled with our observation that banks across combinations become more similar following deals. Third, the importance of bank size as the primary contributor to systematic risk should be acknowledged. The presence of a significant size effect supports arguments that large banks should be subject to greater regulatory scrutiny, for instance, in the form of enhanced risk-based capital, leverage and liquidity requirements, contingent capital requirements, resolution plans and greater public disclosure of information (Krainer, 2012). Narrowing the scope of bank activities without imposing limits on size might lead to significant side effects. Such an effect might be that reforms will not only introduce costs to financial institutions, the taxpayer and the consumer, but will produce renewed imbalances among financial institutions. History shows large conglomerates employ their political clout to weaken regulatory discipline and circumvent restrictions on activities (Carow and Kane, 2002), should they find themselves at a competitive disadvantage to their peers. As such, entering another series of regulatory dialectic (see Kane, 2000) does not represent an optimal solution to the problem. In fact, it raises the probability that large banks could seek to benefit from their market position including taking advantage of safety net provisions. Fourth, regulators should be aware of the risks on the safety net imposed by the post-merger introduction of nonbanks to the banking group. It remains to be seen how effective the principles of subsidiarisation and ring-fencing will be in this regard. Taken together, combining the size factor, regulatory arbitrage, subsidization of non-bank affiliates via the bank safety net and affiliation risk (Herring and Santomero, 1990; Flannery, 1999) represents a potentially thorny issue for both policy makers and regulators.

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Table 1: Sample distribution of bidders and targets by country and deal type

	Bank-Insure		Bank-Agency		Bank-Securities	
Region/Country	Bidders	Targets	Bidders	Targets	Bidders	Targets
Europe (ex. UK)	42	40	4	3	23	16
United Kingdom	7	5	0	0	3	3
United States	47	50	89	90	10	13
Canada	9	6	0	0	1	0
Asia	11	13	0	0	14	19
Australia	6	5	0	0	1	2
South America	2	4	0	0	2	1
Africa	1	2	0	0	0	0
Total	**125**	**125**	**93**	**93**	**54**	**54**

The table presents the distribution of the sample of bidders and targets by country and by deal type. The sample consists of available international data collected for 272 publicly announced deals between 1991 and 2012. Information on deals is obtained by Thomson One Banker. The sample of Bank-Insure announcements consists of deals where the bidder is a bank and the target an insurance company. The sample of Bank-Agency announcements consists of deals where the bidder is a bank and the target an insurance agency/broker. The sample of Bank-Securities announcements consists of deals where the bidder is a bank and the target a securities/commodities broker.

Figure 1: Composition of sample of deals by year and deal type

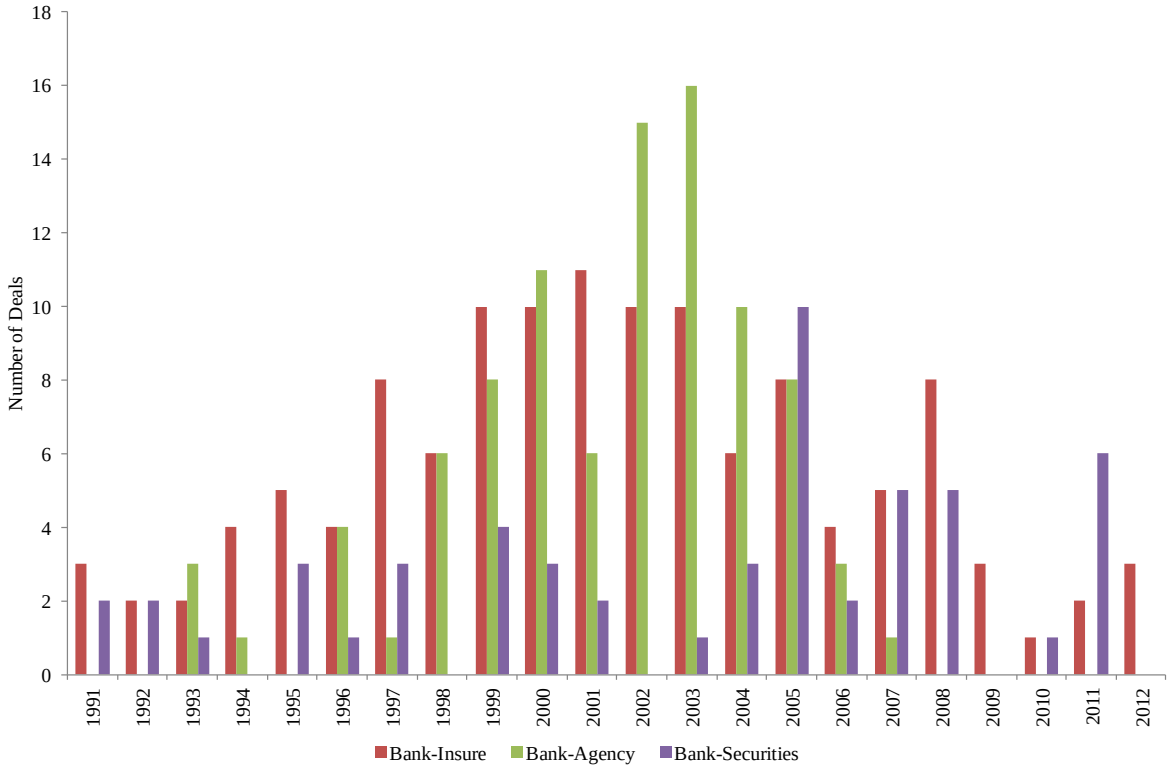

Table 2. Decomposition of total return risk of acquiring banks

	Bank-Insure			**Bank-Agency**			**Bank-Securities**		
	All N=125	Pre-07 N=103	Post-07 N=22	All N=93	Pre-07 N=92	Post-07 N=1	All N=54	Pre-2007 N=37	Post-07 N=17
Panel A: period before announcement (day -250 to day -1)									
$\sigma^2_{R_i}$	4.423	3.913	7.084	3.873	3.829	7.923	3.365	2.955	4.257
	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)
$\beta^2\sigma^2_{R_m}$	1.539	1.307	2.748	0.666	0.655	1.699	1.352	0.956	2.216
	(34.79%)	(33.40%)	(38.80%)	(17.20%)	(17.10%)	(21.44%)	(40.19%)	(32.34%)	(52.04%)
$\sigma^2_{\varepsilon_i}$	2.884	2.606	4.336	3.207	3.174	6.225	2.013	2.000	2.042
	(65.21%)	(66.60%)	(61.20%)	(82.80%)	(82.90%)	(78.56%)	(59.81%)	(67.66%)	(47.96%)
β	0.846	0.812	1.023	0.618	0.611	1.290	0.979	0.930	1.084
σ_β	0.407	0.415	0.317	0.810	0.813	-	0.307	0.337	0.202
$\sigma^2_{R_m}$	1.799	1.587	2.904	1.506	1.511	1.021	1.335	1.070	1.912
Panel B: period after announcement (day +1 to day +250)									
$\sigma^2_{R_i}$	4.773	3.774	9.977	4.003	3.760	26.032	4.659	3.127	7.994
	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)
$\beta^2\sigma^2_{R_m}$	1.721	1.233	4.265	0.868	0.756	11.039	2.159	1.211	4.223
	(36.06%)	(32.66%)	(42.75%)	(21.69%)	(20.11%)	(42.41%)	(46.35%)	(38.74%)	(52.83%)
$\sigma^2_{\varepsilon_i}$	3.052	2.541	5.712	3.134	3.004	14.993	2.500	1.916	3.711
	(63.94%)	(67.34%)	(57.25%)	(78.31%)	(79.89%)	(57.59%)	(53.65%)	(61.26%)	(47.17%)
β	0.901	0.852	1.156	0.726	0.720	1.282	1.018	0.976	1.111
σ_β	0.379	0.365	0.350	1.008	0.844	-	0.363	0.371	0.338
$\sigma^2_{R_m}$	1.943	1.646	3.492	1.419	1.360	6.718	1.762	1.044	3.326
Panel C: Changes in risk post-announcement[1]									
$\Delta\sigma^2_{R_i}$	0.349	-0.139	2.893	0.129	-0.069	18.109	1.294[b]	0.172	3.736[b]
% change	7.90%	-3.55%	40.84%	3.33%	-1.79%	228.56%	38.45%	5.81%	87.76%
$\Delta\beta^2\sigma^2_{R_m}$	0.182	-0.074	1.517[c]	0.202	0.102	9.341	0.807[b]	0.255	2.007[b]
% change	11.82%	-5.68%	55.20%	30.31%	15.50%	549.90%	59.68%	26.73%	90.61%
$\Delta\sigma^2_{\varepsilon_i}$	0.167	-0.065	1.376[a]	-0.073	-0.170	8.768	0.487[a]	-0.084[a]	1.729
% change	5.81%	-2.48%	31.74%	-2.27%	-5.36%	140.86%	24.18%	-4.20%	84.68%
$\Delta\beta$	0.055[c]	0.040	0.133[c]	0.108[a]	0.110[a]	-0.008	0.040	0.045	0.027
% change	6.52%	4.94%	13.04%	17.54%	17.96%	-0.63%	4.04%	4.87%	2.50%
$\Delta\sigma^2_{R_m}$	0.145	0.060	0.588	-0.087	-0.151	5.698	0.427[c]	-0.026	1.414
% change	8.04%	3.75%	20.26%	-5.80%	-9.98%	558.21%	32.00%	-2.42%	73.92%
Panel D: Difference in risk changes between Pre-07 and Post-07 deals									
$\Delta\sigma^2 R_i$		-(1.49)			-			-(2.30)[b]	
$\Delta\beta^2\sigma^2_{R_m}$		-(1.83)[c]			-			-(1.96)[c]	
$\Delta\sigma^2_{\varepsilon_i}$		-(1.07)			-			-(2.13)[b]	
$\Delta\beta$		(1.16)			-			(0.23)	

The Table presents the shift in relative importance of risk factors composing total bank bidder return risk before and after Bank-Insure partnership announcements. We cover 218 bank-insurance and 54 bank-securities deal announcements between 1991 and 2012. The first column identifies the risk measures and statistics; each subsequent column shows the results from subsets of the sample. "Bank-Insure" includes cases when banks bid for insurance companies; "Bank-Agency" includes cases when banks bid for insurance agencies/brokers; "Bank-Securities" presents cases when banks bid for securities firms or commodities brokers. "All" includes the full sample results, while "Pre-07" and "Post-07" present the results for the pre- and post-2007 deals. Panels A and B present results from the pre- and post-announcement periods, whilst Panel C shows differences in the risk measures before and after M&A announcements. Panel D evaluates if the risk changes of the respective pairs of subsets (Pre-07 – Post-07) are equal (t-stats in brackets) We calculate the risk measures using equations [1] and [2]. Variance terms are multiplied by 10^4. $\sigma^2 R_i$ is total risk, $\beta^2\sigma^2_{Rm}$ is the systematic risk component, $\sigma^2_{\varepsilon i}$ is the idiosyncratic risk component. All risk measures are averaged across firms. β is the average beta, while σ_β the standard deviation of betas. σ^2_{Rm} is the average variance of market returns. The numbers in parentheses in Panels A and B show the contribution of the pertinent risk component to total risk. Δs in Panel C represent changes in the variables.

[1]A negative value indicates a reduction in risk or other measures, while positive values indicate an increase. a/b/c denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 3. Summary Statistics

	1. Bank-Insure			2. Bank-Agency			3. Bank-Securities			ΔMean (1 - 2)	ΔMean (1 - 3)	ΔMean (2 - 3)
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	t-stat	t-stat	t-stat
Panel A: Period before announcement (day -250 to day -1)												
$\sigma^2_{R_i}$	4.423	3.324	3.154	3.873	2.976	4.079	3.365	2.473	2.877	(1.10)	(2.17)[b]	(0.87)
β	0.846	0.850	0.407	0.618	0.622	0.413	0.979	1.044	0.307	(3.99)[a]	-(2.36)[b]	-(6.00)[a]
$\sigma^2_{\varepsilon_i}$	2.884	2.305	2.222	3.207	2.166	3.974	2.013	1.688	2.083	-(0.69)	(5.36)[a]	(4.03)[a]
Non-interest income share	0.217	0.189	0.123	0.174	0.162	0.084	0.294	0.279	0.141	(2.96)[a]	-(3.51)[a]	-(5.78)[a]
Diversification (HH index)	0.331	0.323	0.119	0.279	0.286	0.096	0.421	0.453	0.100	(3.41)[a]	-(5.26)[a]	-(8.48)[a]
Loans ratio	0.629	0.652	0.142	0.637	0.638	0.090	0.507	0.534	0.198	-(0.47)	(4.32)[a]	(4.75)[a]
Non-performing loans ratio	0.010	0.006	0.012	0.004	0.003	0.002	0.011	0.003	0.012	(5.31)[a]	-(0.19)	-(2.92)[a]
Loan loss provision ratio	0.004	0.003	0.005	0.002	0.002	0.001	0.003	0.002	0.004	(3.18)[a]	(1.54)	-(0.95)
Loan loss ratio	0.006	0.004	0.008	0.004	0.003	0.002	0.004	0.002	0.008	(2.74)[a]	(0.02)	-(1.50)
ROA	1.357	1.247	1.099	1.543	1.546	0.413	1.109	0.790	0.967	(1.64)	(1.50)	(3.20)[a]
Firm Size	24.271	24.606	2.219	22.253	22.094	1.764	26.542	26.553	1.824	(7.29)[a]	-(7.17)[a]	-(13.99)[a]
Leverage	17.177	14.776	8.457	12.518	12.120	4.647	21.089	18.196	12.904	(4.95)[a]	-(2.09)[b]	-(4.85)[a]
Panel B: Period after announcement (day +1 to day +250)												
$\sigma^2_{R_i}$	4.773	3.274	4.964	4.003	3.027	3.528	4.659	2.834	4.744	(1.31)	(0.14)	-(0.88)
β	0.901	0.920	0.379	0.726	0.713	0.499	1.018	1.094	0.363	(2.78)[a]	-(1.93)[c]	-(4.07)[a]
$\sigma^2_{\varepsilon_i}$	3.052	2.085	3.640	3.134	2.074	2.874	2.500	1.675	2.614	-(0.18)	(1.13)	(1.36)
Non-interest income share	0.248	0.239	0.118	0.218	0.201	0.102	0.304	0.277	0.178	(1.83)[c]	-(2.16)[b]	-(3.29)[a]
Diversification (HH index)	0.354	0.383	0.121	0.327	0.328	0.087	0.421	0.449	0.089	(1.78)[c]	-(4.18)[a]	-(6.34)[a]
Loans ratio	0.635	0.647	0.125	0.643	0.645	0.115	0.475	0.501	0.207	-(0.45)	(5.32)[a]	(5.56)[a]
Non-performing loans ratio	0.011	0.006	0.015	0.004	0.004	0.003	0.014	0.006	0.019	(4.21)[a]	-(0.86)	-(2.84)[a]
Loan loss provision ratio	0.004	0.003	0.004	0.002	0.002	0.002	0.004	0.001	0.005	(2.48)[b]	-(0.28)	-(1.80)[c]
Loan loss ratio	0.005	0.004	0.005	0.004	0.003	0.003	0.004	0.002	0.007	(2.85)[a]	(0.38)	-(1.07)
ROA	1.224	1.254	0.693	1.415	1.552	0.625	0.794	0.607	1.405	-(1.93)[c]	(2.15)[b]	(3.10)[a]
Firm Size	24.469	24.711	2.263	22.501	22.275	1.784	26.625	26.585	2.081	(6.79)[a]	-(6.16)[a]	-(12.22)[a]
Leverage	17.040	14.477	8.796	12.454	11.707	5.493	20.606	16.679	13.861	(4.39)[a]	-(1.76)[c]	-(4.22)[a]

The Table reports summary statistics for measures of risk, accounting data and other characteristics of banks bidding for insurance companies (Bank-Insure), insurance agents/brokers (Bank-Agency) and securities/commodities brokers (Bank-Securities). The sample period is 1991 to 2012. We calculate the risk measures using equations [1] and [2]. σ^2Ri is total risk, β is the market beta and $\sigma^2_{\varepsilon i}$ is the idiosyncratic risk component. Variance terms are multiplied by 10^4. Non-interest income share (percentage of non-interest income-to-total operating income), Diversification (HH index capturing the degree of diversification in bank net operating revenue) and Loan loss ratio (percentage of loans-to-total assets) proxy for revenue diversification. Non-performing loans ratio (percentage of non-performing loans-to-total assets), Loan loss provision ratio (percentage of loan loss provisions-to-total assets) and Loan loss ratio (percentage of loan losses-to-total assets) proxy for loan risk. ROA (percentage of net income-to-total assets), Firm size (natural logarithm of total assets) and Leverage (percentage of total assets-to-common equity ratio) are control variables capturing profitability, size and leverage, respectively. We source all balance sheet and income statement variables at year-end prior to and after each announcement. The t-test evaluates if the means of the respective pairs of subsets are equal. Figures in parentheses show t-values. a/b/c denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 4. Decomposition of total return risk and bank pre-announcement characteristics

	Bank-Insure		Bank-Agency		Bank-Securities	
	High (H)	Low (L)	High (H)	Low (L)	High (H)	Low (L)
Panel A: Diversification						
Period before announcement (day -250 to day -1)						
$\sigma^2_{R_i}$	4.219	4.694	2.967	4.985	3.515	3.372
$\beta^2\sigma^2_{R_m}$	1.816	1.178	0.846	0.417	1.543	1.204
$\sigma^2_{\varepsilon_i}$	2.403	3.515	2.121	4.568	1.972	2.168
β	0.905	0.777	0.748	0.453	1.082	0.873
Period after announcement (day +1 to day +250)						
$\sigma^2 R_i$	4.811	4.845	3.351	5.007	4.644	5.038
$\beta^2\sigma^2_{R_m}$	2.036	1.427	0.911	0.873	2.136	2.351
$\sigma^2_{\varepsilon_i}$	2.775	3.418	2.440	4.134	2.508	2.687
β	0.977	0.823	0.876	0.559	1.165	0.884
Changes in risk post-announcement[1]						
$\Delta\sigma^2 R_i$	0.592	0.151	0.384	0.022	1.129	1.666[c]
$\Delta\beta^2\sigma^2_{R_m}$	0.220	0.249	0.065	0.456[c]	0.593	1.147[b]
$\Delta\sigma^2_{\varepsilon_i}$	0.372	-0.097	0.319	-0.434[a]	0.536	0.519
$\Delta\beta$	0.072[c]	0.046	0.128[a]	0.106	0.083[c]	0.011
N	56	54	43	40	26	25
Difference in risk changes between subsets[2]						
$\Delta\sigma^2 R_{i\ \text{H-L}}$	(0.52)		(0.33)		-(0.46)	
$\Delta\beta^2\sigma^2_{R_m\ \text{H-L}}$	-(0.06)		-(1.44)		-(0.81)	
$\Delta\sigma^2_{\varepsilon_i\ \text{H-L}}$	(0.85)		(0.78)		(0.02)	
$\Delta\beta_{\text{H-L}}$	(0.44)		(0.28)		(1.07)	
Panel B: Risk						
Period before announcement (day -250 to day -1)						
$\sigma^2_{R_i}$	6.811	2.036	5.880	1.867	5.183	1.548
$\beta^2\sigma^2_{R_m}$	2.406	0.672	0.800	0.532	2.102	0.602
$\sigma^2_{\varepsilon_i}$	4.405	1.364	5.080	1.335	3.080	0.945
β	0.882	0.810	0.608	0.628	1.052	0.905
Period after announcement (day +1 to day +250)						
$\sigma^2_{R_i}$	6.950	2.596	5.601	2.404	6.641	2.678
$\beta^2\sigma^2_{R_m}$	2.450	0.992	1.061	0.675	3.127	1.192
$\sigma^2_{\varepsilon_i}$	4.500	1.604	4.540	1.729	3.514	1.485
β	0.923	0.879	0.688	0.765	1.091	0.945
Changes in risk post-announcement[1]						
$\Delta\sigma^2 R_i$	0.139	0.560[a]	-0.279	0.537[b]	1.458	1.130
$\Delta\beta^2\sigma^2_{R_m}$	0.044	0.320[b]	0.261	0.143	1.025[c]	0.590[c]
$\Delta\sigma^2_{\varepsilon_i}$	0.095	0.240[b]	-0.540	0.394[b]	0.434	0.540
$\Delta\beta$	0.041	0.069[b]	0.080	0.137[a]	0.039	0.040
N	63	62	47	46	27	27
Difference in risk changes between subsets[2]						
$\Delta\sigma^2 R_{i\ \text{H-L}}$	(-0.54)		-(0.86)		(0.30)	
$\Delta\beta^2\sigma^2_{R_m\ \text{H-L}}$	-(0.69)		(0.47)		(0.68)	
$\Delta\sigma^2_{\varepsilon_i\ \text{H-L}}$	-(0.28)		-(1.11)		-(0.16)	
$\Delta\beta_{\text{H-L}}$	-(0.51)		-(0.76)		-(0.00)	
Panel C: Size						
Period before announcement (day -250 to day -1)						
$\sigma^2_{R_i}$	4.721	4.193	2.945	5.008	3.561	3.201
$\beta^2\sigma^2_{R_m}$	2.186	0.844	0.834	0.431	1.452	1.235
$\sigma^2_{\varepsilon_i}$	2.535	3.349	2.112	4.577	2.109	1.966
β	1.061	0.631	0.701	0.504	1.106	0.856
Period after announcement (day +1 to day +250)						
$\sigma^2_{R_i}$	4.728	4.923	3.229	5.138	5.341	3.930
$\beta^2\sigma^2_{R_m}$	2.187	1.304	0.978	0.800	2.969	1.431
$\sigma^2_{\varepsilon_i}$	2.541	3.620	2.250	4.338	2.372	2.499
β	1.034	0.774	0.784	0.657	1.196	0.870
Changes in risk post-announcement[1]						
$\Delta\sigma^2 R_i$	0.007	0.730	0.284	0.130	1.780[c]	0.729
$\Delta\beta^2\sigma^2_{R_m}$	0.001	0.460[a]	0.144	0.369	1.517[b]	0.196

$\Delta\sigma_{\varepsilon_i}^2$	0.006	0.271	0.138	-0.239	0.263	0.533
$\Delta\beta$	-0.027	0.143[a]	0.083[b]	0.153[b]	0.090[c]	0.014
N	54	56	43	40	24	28
Difference in risk changes between subsets[2]						
$\Delta\sigma^2 R_i$ H-L	-(0.86)		(0.14)		(0.92)	
$\Delta\beta^2\sigma_{R_m}^2$ H-L	-(1.08)		-(0.82)		(1.94)[c]	
$\Delta\sigma_{\varepsilon_i}^2$ H-L	-(0.48)		(0.39)		-(0.41)	
$\Delta\beta$ H-L	-(2.98)[a]		-(0.88)		(1.16)	

The Table presents the shift in risk factors composing total bank bidder return risk before and after partnership announcements between 1991 and 2012. The first column identifies the risk measures and statistics; each subsequent column contains the results from subsets of the sample. "Bank-Insure" are presents cases when banks bid for insurance companies; "Bank-Agency" and "Bank-Securities" present cases when banks bid for insurance agencies/brokers and securities/commodities brokers. Panel A splits the sample based on banks' pre-announcement level (median value) of diversification (non-interest income share). Panels B and C split the sample based on the banks' pre-announcement level of risk (total risk) and size (total assets). We calculate the risk measures using equations [1] and [2]. Variance terms are multiplied by 10^4. $\sigma^2 R_i$ is total risk, $\beta^2\sigma^2_{Rm}$ is the systematic risk component, $\sigma^2_{\varepsilon i}$ is the idiosyncratic risk component and β is the average beta. All risk measures are averaged across firms. σ^2_{Rm} is the average variance of market returns. Δs represent changes in the respective variables.
[1]A negative value indicates a reduction in risk or other measures, while positive values indicate an increase.
[2]T-stat evaluates if the means of the respective pairs of subsets are equal (t-stats in brackets).
a/b/c denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 5. Decomposition of total return risk and bank geography

	Bank-Insure		**Bank-Agency**		**Bank-Securities**	
	US N=47	EU N=42	US N=89	EU N=4	US N=10	EU N=26
Panel A: Period before announcement (day -250 to day -1)						
$\sigma^2_{R_i}$	3.905	4.432	3.923	2.414	3.386	2.196
$\beta^2\sigma^2_{R_m}$	0.751	2.033	0.668	0.601	1.329	0.717
$\sigma^2_{\varepsilon_i}$	3.153	2.399	3.254	1.813	2.057	1.479
β	0.672	0.988	0.622	0.502	1.167	0.837
Panel B: Period after announcement (day +1 to day +250)						
$\sigma^2 R_i$	4.256	4.387	4.055	2.450	5.560	3.616
$\beta^2\sigma^2_{R_m}$	1.152	1.799	0.863	1.010	2.481	1.387
$\sigma^2_{\varepsilon_i}$	3.104	2.589	3.192	1.440	3.079	2.229
β	0.826	0.970	0.729	0.637	1.297	0.845
Panel C: Changes in risk post-announcement[1]						
$\Delta\sigma^2 R_i$	0.351	-0.045	0.132	0.036	2.174[c]	1.420
$\Delta\beta^2\sigma^2_{R_m}$	0.401[b]	-0.234	0.195	0.409	1.152	0.670[c]
$\Delta\sigma^2_{\varepsilon_i}$	-0.049	0.190	-0.062	-0.373	1.022[c]	0.750
$\Delta\beta$	0.154[a]	-0.018	0.107[a]	0.135[c]	0.130	0.008
Panel D: Difference in risk changes between subsets						
$\Delta\sigma^2 R_i$ US-EU	(0.46)		(0.19)		(0.56)	
$\Delta\beta^2\sigma^2_{R_m}$ US-EU	(1.43)		-(0.75)		(0.52)	
$\Delta\sigma^2_{\varepsilon_i}$ US-EU	-(0.40)		(0.59)		(0.38)	
$\Delta\beta$ US-EU	(2.54)[b]		-(0.52)		(1.23)	

The Table presents the shift in risk factors composing total bank bidder return risk before and after partnership announcements between 1991 and 2012. The first column identifies the risk measures and statistics; each subsequent column contains the results from subsets of the sample. "Bank-Insure" presents cases when banks bid for insurance companies; "Bank-Agency" and "Bank-Securities" present cases when banks bid for insurance agencies/brokers and securities/commodities brokers. "EU", "US" and "Other" present deals where the bidder is located either in the United States, Europe or other countries. Panels A and B present results from the pre- and post-announcement periods. Panel C shows the differences in the risk measures before and after M&A announcements. Panel D evaluates if the means of the respective pairs of subsets are equal (t-stats in brackets). We calculate the risk measures using equations [1] and [2]. Variance terms are multiplied by 10^4. $\sigma^2 R_i$ is total risk, $\beta^2\sigma^2_{Rm}$ is the systematic risk component, $\sigma^2_{\varepsilon i}$ is the idiosyncratic risk component and β is the average beta. All risk measures are averaged across firms. σ^2_{Rm} is the average variance of market returns. Δs represent changes in the respective variables.
[1]A negative value indicates a reduction in risk or other measures, while positive values indicate an increase.
a/b/c denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 6. Market beta and idiosyncratic risk regressions

$$Y_{j,i} = \alpha + \beta_1 DIV_{k,i} + \beta_2 LL_{h,i} + \beta_3 ROA_i + \beta_4 LEV_i + \beta_5 Size_i + \varepsilon_\iota$$

	Bank-Insure		Bank-Agency		Bank-Securities	
	Before	**After**	**Before**	**After**	**Before**	**After**
Panel A: Market Beta						
Constant	0.492	0.796	-0.062	0.497	-0.838	1.067
	(5.85)[a]	(6.78)[a]	-(0.38)	(2.77)[a]	-(1.53)	(7.25)[a]
Non-interest income share	0.716	0.183	1.770	0.235	0.845	0.785
	(3.85)[a]	(0.64)	(4.06)[a]	(0.65)	(4.07)[a]	(2.46)[a]
Loan loss provision ratio	7.829	15.366	33.097	59.629	-4.936	-0.446
	(1.30)	(1.79)[c]	(1.64)	(3.03)[a]	-(0.67)	-(0.08)
ROA	-0.013	-0.115	0.131	-0.103	0.065	-0.082
	-(0.50)	-(2.42)[b]	(1.37)	-(1.26)	(1.42)	-(1.45)
Leverage	0.009	-0.001	0.006	0.004	-0.010	-0.012
	(2.69)[a]	-(0.21)	(0.79)	(0.74)	-(3.35)[a]	-(3.89)[a]
Firm size	0.116	0.073	0.083	0.098	0.068	0.079
	(6.66)[a]	(3.31)[a]	(2.61)[b]	(4.01)[a]	(3.34)[a]	(3.48)[a]
N	105	92	82	77	49	51
Adjusted R-squared	0.33	0.15	0.20	0.10	0.38	0.41
F-statistic	11.43	4.19	4.97	2.72	6.95	8.00
Panel B: Idiosyncratic Risk[1]						
Constant	3.960	1.230	5.590	4.260	-4.830	-0.102
	(5.97)[a]	(1.81)[c]	(4.62)[a]	(4.61)[a]	-(1.79)[c]	-(0.05)
Non-interest income share	-4.320	-0.216	-11.210	-8.680	0.456	7.890
	-(2.86)[a]	-(0.10)	-(2.57)[a]	-(2.66)[a]	(0.51)	(1.33)
Loan loss provision ratio	117.410	474.500	-173.870	532.080	229.600	28.840
	(3.06)[a]	(3.81)[a]	-(0.69)	(2.33)[b]	(2.10)[b]	(0.79)
ROA	-0.272	0.226	0.366	0.349	0.743	-0.477
	-(1.75)[c]	(0.57)	(0.41)	(0.52)	(2.41)[b]	-(1.10)
Leverage	-0.028	-0.001	-0.041	-0.014	-0.023	0.014
	-(1.32)	-(0.06)	-(0.96)	-(0.30)	-(1.71)[c]	(0.42)
Firm size	-0.216	-0.389	-0.634	-0.574	0.226	-0.214
	-(2.02)[b]	-(1.91)[c]	-(1.70)[c]	-(2.74)[a]	(2.05)[b]	-(0.84)
N	105	92	82	77	49	51
Adjusted R-squared	0.15	0.40	0.04	0.22	0.49	0.02
F-statistic	4.58	13.32	1.59	5.20	10.22	1.20

The Table presents OLS regressions of bank market beta, β, and bank idiosyncratic risk, $\sigma^2_{\varepsilon_i}$, on a measure of revenue diversification, and proxies for risk, profitability, and size before and after deal announcements where banks bid for insurance companies (Bank-Insure), insurance agencies/brokers (Bank-Agency) and securities/commodities brokers (Bank-Securities). The sample period is 1991 to 2012. Panels A and B present the results from separate estimations of equation [4] when the dependent variable is market beta or idiosyncratic risk. Within each Panel, the Table presents estimations for each subsample using pre- and post-announcement data. The first column identifies the independent variables. Non-interest income share is proxy for revenue diversification and equals the percentage of non-interest income-to-total operating income. Loan loss provision ratio is proxy for loan risk and equals the percentage of loan loss provisions-to-total assets. We specify three bank-specific characteristics as control variables; ROA, leverage, and firm size. ROA is the percentage of net income-to-total assets; Leverage is the percentage of total assets-to-common equity; and firm size is the natural logarithm of total assets. In cases where independent variables are correlated with one another, we use auxiliary regressions to make them orthogonal. We source all balance sheet and income statement variables at year-end prior to and after each announcement. Figures in brackets show t-values (White errors). a/b/c denote statistical significance at the 1%, 5% and 10%, respectively.

[1]All betas are multiplied by 10^4.

Table 7. Market beta and idiosyncratic risk regressions: bank characteristics

$$Y_{j,i} = \alpha + \beta_1 DIV_{k,i} + \beta_2 LL_{h,i} + \beta_3 ROA_i + \beta_4 LEV_i + \beta_5 Size_i + \beta_6 DD + \beta_7 DR + \beta_8 DS + \varepsilon_\iota$$

	Bank-Insure		Bank-Agency		Bank-Securities	
	Before	**After**	**Before**	**After**	**Before**	**After**
Panel A: Market Beta						
Constant	0.385	0.743	-0.257	0.510	0.314	0.877
	(3.96)[a]	(5.49)[a]	-(1.28)	(2.61)[b]	(0.35)	(4.91)[a]
Non-interest income share	1.064	-0.007	1.718	-0.055	0.783	0.564
	(3.24)[a]	-(0.02)	(2.71)[a]	-(0.10)	(2.57)[b]	(1.65)
Loan loss provision ratio	11.619	15.826	61.579	51.494	-5.194	0.917
	(1.80)[c]	(1.62)	(1.87)[c]	(2.54)[b]	-(0.87)	(0.17)
ROA	-0.014	-0.143	0.221	-0.052	0.062	-0.072
	-(0.53)	-(2.46)[b]	(2.02)[b]	-(0.55)	(1.47)	-(1.34)
Leverage	0.014	0.002	0.013	0.010	-0.009	-0.010
	(3.31)[a]	(0.35)	(1.37)	(1.83)[c]	-(2.41)[b]	-(3.68)[a]
Firm size	0.145	0.072	0.158	0.129	0.018	0.024
	(6.86)[a]	(2.41)[b]	(3.48)[a]	(2.90)[a]	(0.53)	(0.63)
DD	-0.077	0.104	0.139	0.291	0.012	0.174
	-(0.79)	(0.86)	(1.04)	(2.30)[b]	(0.11)	(1.80)[c]
DR	0.066	0.044	0.008	-0.039	0.110	0.052
	(0.93)	(0.54)	(0.08)	-(0.38)	(1.16)	(0.60)
DS	-0.242	-0.068	-0.317	-0.273	0.199	0.213
	-(2.43)[b]	-(0.57)	-(1.87)[c]	-(1.43)	(1.58)	(1.41)
N	105	91	82	77	49	49
Adjusted R-squared	0.36	0.14	0.23	0.16	0.40	0.44
F-statistic	8.18	2.79	4.00	2.79	5.08	5.76
Panel B: Idiosyncratic Risk[1]						
Constant	2.940	0.741	1.060	2.410	-8.330	-2.750
	(6.72)[a]	(1.02)	(0.78)	(2.44)[a]	-(1.74)[c]	-(1.24)
Non-interest income share	-4.310	-0.818	2.510	-7.530	-0.476	9.420
	-(2.85)[a]	-(0.27)	(0.69)	-(3.29)[a]	-(0.26)	(1.81)[c]
Loan loss provision ratio	33.470	408.290	-133.550	509.090	196.460	19.030
	(0.91)	(2.97)[a]	-(0.70)	(2.39)[b]	(1.82)[c]	(0.44)
ROA	-0.176	0.111	0.690	-0.291	0.608	-0.149
	-(1.11)	(0.27)	(0.86)	-(0.45)	(2.14)[b]	-(0.30)
Leverage	-0.031	0.001	0.038	0.013	-0.010	0.043
	-(1.95)[c]	(0.03)	(0.70)	(0.31)	-(0.78)	(1.35)
Firm size	-0.307	-0.456	-0.474	-0.474	0.340	-0.783
	-(2.99)[a]	-(2.39)[b]	-(1.46)	-(1.55)	(1.81)[c]	-(1.74)[c]
DD	-0.587	-0.108	-1.430	-0.002	0.652	-0.784
	-(1.86)[c]	-(0.16)	-(1.57)	(0.00)	(1.17)	-(0.81)
DR	2.810	1.510	3.280	2.290	0.930	2.320
	(9.67)[a]	(3.32)[a]	(4.50)[a]	(3.35)[a]	(3.32)[a]	(2.90)[a]
DS	1.070	0.601	-0.722	0.174	-0.541	2.130
	(2.50)[b]	(0.98)	-(1.24)	(0.20)	-(0.93)	(1.37)
N	105	91	82	77	49	49
Adjusted R-squared	0.59	0.45	0.20	0.33	0.57	0.21
F-statistic	19.59	10.24	3.53	5.60	9.01	2.61

The Table presents OLS regressions of bank market beta, β, and bank idiosyncratic risk, $\sigma^2_{\varepsilon_i}$, on a measure of revenue diversification, and proxies for risk, profitability, and size before and after deal announcements where banks bid for insurance companies (Bank-Insure), insurance agencies/brokers (Bank-Agency) and securities/commodities brokers (Bank-Securities). The sample period is 1991 to 2012. Panels A and B present the results from separate estimations of equation [4] when the dependent variable is market beta or idiosyncratic risk. Within each Panel, the Table presents estimations for each subsample using pre- and post-announcement data. The first column identifies the independent variables. Non-interest income share is proxy for revenue diversification and equals the percentage of non-interest income-to-total operating income. Loan loss provision ratio is proxy for loan risk and equals the percentage of loan loss provisions-to-total assets. We specify three bank-specific characteristics as control variables; ROA, leverage, and firm size. ROA is the percentage of net income-to-total assets; Leverage is the percentage of total assets-to-common equity; and firm size is the natural logarithm of total assets. DD, DR and DS are dummy variables equal to one when bank pre-announcement non-interest income share, total risk, and total assets are above the median value of the pertinent sample and zero otherwise. In cases where independent variables are correlated with one another, we use auxiliary regressions to make them orthogonal. We source all balance sheet and income statement variables at year-end prior to and after each announcement. Figures in brackets show t-values (White errors). a/b/c denote statistical significance at the 1%, 5% and 10%, respectively.

[1]All betas are multiplied by 10^4.

Table 8. Market beta and idiosyncratic risk regressions: Size interactions

$$Y_{j,i} = \alpha + \beta_1 DS + \beta_2 DIV_{k,i} + \beta_3 LL_{h,i} + \beta_4 ROA_i + \beta_5 LEV_i + \beta_6 Size_i + DS \times \left(\beta_7 DIV_{k,i} + \beta_8 LL_{h,i} + \beta_9 ROA_i + \beta_{10} LEV_i + \beta_{11} Size_i\right) + \varepsilon_t$$

	Bank-Insure		Bank-Agency		Bank-Securities	
	Before	**After**	**Before**	**After**	**Before**	**After**
Panel A: Market Beta						
Constant	0.483	0.902	-1.287	0.302	-0.323	1.268
	(4.66)[a]	(4.69)[a]	-(2.81)[a]	(0.78)	-(0.21)	(6.74)[a]
DS	0.115	0.261	1.563	0.332	0.340	-0.213
	(0.28)	(0.90)	(3.11)[a]	(0.82)	(0.16)	-(0.68)
Non-interest income share	0.583	-0.178	6.012	3.440	0.962	0.154
	(2.87)[a]	-(0.43)	(4.84)[a]	(2.39)[b]	(2.24)[a]	(0.42)
Loan loss provision ratio	21.012	32.963	173.293	52.823	-8.381	-4.696
	(2.32)[b]	(1.41)	(1.73)[c]	(1.86)[c]	-(1.61)	-(0.60)
ROA	-0.027	-0.184	0.435	0.035	0.098	0.059
	-(0.93)	-(2.14)[b]	(2.26)[b]	(0.24)	(2.15)[b]	(0.66)
Leverage	0.012	-0.004	0.026	0.011	-0.012	-0.015
	(2.17)[b]	-(0.68)	(1.00)	(0.57)	-(2.20)[b]	-(6.46)[a]
Firm size	0.158	0.110	0.420	0.442	0.048	0.081
	(7.17)[a]	(3.75)[a]	(4.71)[a]	(3.96)[a]	(0.87)	(1.35)
DS × Non-interest income share	0.731	0.653	-4.578	-2.898	-0.981	1.050
	(2.14)[b]	(1.40)	-(3.62)[a]	-(2.00)[b]	-(1.80)[c]	(1.66)
DS × Loan loss provision ratio	-17.835	-19.257	-149.976	-43.517	14.452	-2.515
	-(1.56)	-(0.81)	-(1.48)	-(1.14)	(0.99)	-(0.11)
DS × ROA	-0.037	0.163	-0.482	-0.106	-0.108	-0.190
	-(0.61)	(1.58)	-(2.26)[b]	-(0.57)	-(1.63)	-(1.46)
DS × Leverage	-0.011	-0.007	-0.017	-0.010	0.010	0.008
	-(1.02)	-(0.88)	-(0.64)	-(0.52)	(1.60)	(1.04)
DS × Firm size	-0.132	-0.155	-0.390	-0.422	-0.008	-0.099
	-(2.01)[b]	-(3.21)[a]	-(4.21)[a]	-(3.66)[a]	-(0.10)	-(1.30)
N	105	91	82	77	49	51
Adjusted R-squared	0.36	0.15	0.43	0.23	0.41	0.43
F-statistic	6.43	2.49	6.49	3.10	4.06	4.46
Panel B: Idiosyncratic Risk[1]						
Constant	4.460	0.891	3.030	3.300	-4.800	-3.880
	(5.65)[a]	(0.77)	(0.68)	(1.47)	-(0.86)	-(1.07)
DS	-0.448	5.640	-2.230	0.471	-3.320	6.110
	-(0.10)	(1.36)	-(0.48)	(0.18)	-(0.35)	(1.19)
Non-interest income share	-5.410	3.190	-33.690	-13.430	2.900	11.370
	-(2.87)[a]	(0.99)	-(1.98)[a]	-(1.41)	(2.01)[c]	(1.48)
Loan loss provision ratio	25.640	207.700	-1497.670	639.000	328.210	122.580
	(0.38)	(1.28)	-(0.92)	(2.33)[b]	(4.45)[a]	(1.29)
ROA	-0.105	0.967	3.130	0.788	1.150	-0.291
	-(0.57)	(1.69)[c]	(0.97)	(0.71)	(3.94)[a]	-(0.32)
Leverage	-0.048	0.010	0.316	0.066	0.009	0.063
	-(1.70)[c]	(0.23)	(0.97)	(0.34)	(0.44)	(1.58)
Firm size	-0.476	-0.587	-1.360	-1.220	0.162	-1.100
	-(2.71)[a]	-(2.23)[b]	-(1.03)	-(1.81)[c]	(0.72)	-(1.39)
DS × Non-interest income share	2.040	-8.700	32.910	6.570	-6.590	-5.050
	(0.39)	-(2.28)[b]	(1.90)[c]	(0.66)	-(3.02)[a]	-(0.47)
DS × Loan loss provision ratio	109.970	362.750	1703.190	-302.290	-346.450	-193.370
	(1.01)	(2.20)[b]	(1.04)	-(0.75)	-(3.84)[a]	-(1.49)
DS × ROA	-0.726	-1.120	-2.650	-0.233	-1.090	-0.299
	-(1.06)	-(1.55)	-(0.80)	-(0.15)	-(2.77)[a]	-(0.25)
DS × Leverage	0.032	-0.135	-0.314	-0.090	-0.029	-0.115
	(0.35)	-(1.29)	-(0.96)	-(0.46)	-(1.13)	-(1.61)
DS × Firm size	0.264	-0.383	1.370	1.040	0.234	0.936
	(0.42)	-(0.56)	(1.03)	(1.47)	(0.69)	(0.92)
N	105	91	82	77	49	51

Adjusted R-squared	0.18	0.48	0.11	0.19	0.65	0.01
F-statistic	3.04	8.66	1.94	2.61	9.12	1.06

The Table presents OLS regressions of bank market beta, β, and bank idiosyncratic risk, $\sigma_{\varepsilon_i}^2$, on a measure of revenue diversification, and proxies for risk, profitability, and size before and after deal announcements where banks bid for insurance companies (Bank-Insure), insurance agencies/brokers (Bank-Agency) and securities/commodities brokers (Bank-Securities). The sample period is 1991 to 2012. Panels A and B present the results from separate estimations of equation [4] when the dependent variable is market beta or idiosyncratic risk. Within each Panel, the Table presents estimations for each subsample using pre-announcement and post-announcement data. The first column identifies the independent variables. DS is a dummy variable equal to one when bank pre-announcement total assets are above the median value of the pertinent sample and zero otherwise. Non-interest income share is proxy for revenue diversification and equals the percentage of non-interest income-to-total operating income. Loan loss provision ratio is proxy for loan risk and equals the percentage of loan loss provisions-to-total assets. We specify three bank-specific characteristics as control variables; ROA, leverage, and firm size. ROA is the percentage of net income-to-total assets; Leverage is the percentage of total assets-to-common equity; and firm size is the natural logarithm of total assets. In cases where independent variables are correlated with one another, we use auxiliary regressions to make them orthogonal. We source all balance sheet and income statement variables at year-end prior to and after each announcement. Figures in brackets indicate t-values (White errors). a/b/c denote statistical significance at the 1%, 5% and 10%, respectively.

[1]All betas are multiplied by 10^4.

Table 9. Market beta and idiosyncratic risk regressions: Risk interactions

$$Y_{j,i} = \alpha + \beta_1 DR + \beta_2 DIV_{k,i} + \beta_3 LL_{h,i} + \beta_4 ROA_i + \beta_5 LEV_i + \beta_6 Size_i + DR \times \left(\beta_7 DIV_{k,i} + \beta_8 LL_{h,i} + \beta_9 ROA_i + \beta_{10} LEV_i + \beta_{11} Size_i\right) + \varepsilon_i$$

	Bank-Insure		Bank-Agency		Bank-Securities	
	Before	**After**	**Before**	**After**	**Before**	**After**
Panel A: Market Beta						
Constant	0.681	0.879	-0.174	0.570	-1.599	1.052
	(5.39)[a]	(5.47)[a]	-(0.68)	(1.43)	-(1.83)[c]	(3.32)[a]
DR	-0.291	-0.036	-0.061	-0.162	2.848	0.465
	-(1.56)	-(0.12)	-(0.15)	-(0.33)	(2.47)[a]	(1.17)
Non-interest income share	0.417	0.045	2.050	0.019	1.270	0.413
	(1.14)	(0.15)	(2.76)[a]	(0.02)	(5.86)[a]	(0.54)
Loan loss provision ratio	-29.373	-13.252	34.348	122.147	0.736	10.972
	-(1.10)	-(0.48)	(0.91)	(2.83)[a]	(0.02)	(0.62)
ROA	-0.028	-0.103	0.210	0.232	0.132	0.062
	-(0.86)	-(1.06)	(1.52)	(1.60)	(0.84)	(0.47)
Leverage	0.006	-0.001	0.000	-0.002	-0.008	-0.009
	(1.48)	-(0.16)	-(0.05)	-(0.39)	-(1.23)	-(2.14)[b]
Firm size	0.107	0.044	0.041	0.073	0.089	0.121
	(3.48)[a]	(1.31)	(0.81)	(2.11)[b]	(2.20)[b]	(4.10)[a]
DR × Non-interest income share	0.429	0.287	-0.338	0.337	-2.029	0.113
	(0.89)	(0.41)	-(0.34)	(0.31)	-(4.47)[a]	(0.14)
DR × Loan loss provision ratio	40.421	31.723	-34.506	-60.807	-15.850	-18.336
	(1.44)	(1.07)	-(0.74)	-(1.16)	-(0.41)	-(0.94)
DR × ROA	-0.013	-0.061	-0.063	-0.567	-0.148	-0.228
	-(0.17)	-(0.50)	-(0.30)	-(2.61)[b]	-(0.91)	-(1.58)
DR × Leverage	0.008	-0.006	0.029	0.011	-0.015	-0.021
	(1.00)	-(0.61)	(1.23)	(0.60)	-(1.59)	-(1.98)[c]
DR × Firm size	0.004	0.047	0.106	0.032	-0.071	-0.091
	(0.11)	(1.03)	(1.45)	(0.65)	-(1.53)	-(2.39)[b]
N	105	92	82	77	49	51
Adjusted R-squared	0.32	0.12	0.18	0.10	0.51	0.46
F-statistic	5.50	2.11	2.60	1.75	5.49	4.94
Panel B: Idiosyncratic Risk[1]						
Constant	2.140	1.670	3.170	3.000	-1.920	-1.620
	(9.35)[a]	(4.41)[a]	(10.50)[a]	(3.21)[a]	-(1.54)	-(0.41)
DR	3.200	-1.050	-1.150	-0.056	-4.300	1.240
	(3.67)[a]	-(0.56)	-(0.35)	-(0.03)	-(0.70)	(0.25)
Non-interest income share	-1.040	0.509	-4.140	-7.250	0.634	5.380
	-(1.67)[c]	(0.64)	-(6.46)[a]	-(2.56)[b]	(1.47)	(0.50)
Loan loss provision ratio	-93.760	148.080	-33.610	162.600	17.330	182.220
	-(2.29)[b]	(1.46)	-(0.61)	(2.34)[b]	(0.28)	(1.81)[c]
ROA	0.104	0.538	-0.693	-1.250	0.253	-0.308
	(2.20)[b]	(2.20)[b]	-(3.53)[a]	-(3.65)[a]	(1.16)	-(0.18)
Leverage	-0.015	-0.024	0.017	0.014	-0.007	0.050
	-(2.50)[b]	-(2.79)[a]	(2.62)[b]	(0.89)	-(1.17)	(0.96)
Firm size	-0.199	-0.136	-0.087	-0.040	0.095	-0.142
	-(2.61)[b]	-(1.92)[c]	-(1.45)	-(0.40)	(1.80)[c]	-(0.55)
DR × Non-interest income share	-5.340	-2.300	-3.160	-1.830	1.830	6.750
	-(2.97)[a]	-(0.43)	-(0.53)	-(0.42)	(0.56)	(0.54)
DR × Loan loss provision ratio	177.580	253.310	-235.820	633.010	200.570	-214.290
	(3.80)[a]	(1.54)	-(0.80)	(2.53)[b]	(1.42)	-(1.95)[c]
DR × ROA	-1.010	-0.081	1.640	0.890	0.425	-0.031
	-(4.86)[a]	-(0.12)	(1.18)	(0.53)	(0.83)	-(0.02)
DR × Leverage	0.020	0.158	0.266	0.113	0.001	-0.010
	(0.54)	(2.11)[b]	(0.91)	(0.83)	(0.03)	-(0.10)
DR × Firm size	-0.122	-0.454	-1.190	-0.868	0.169	-0.046
	-(0.83)	-(1.35)	-(1.34)	-(2.63)[b]	(0.84)	-(0.14)
N	105	92	82	77	49	51
Adjusted R-squared	0.63	0.50	0.20	0.39	0.53	0.16

F-statistic	17.37	9.19	2.83	5.41	6.00	1.87

The Table presents OLS regressions of bank market beta, β, and bank idiosyncratic risk, $\sigma_{\varepsilon_i}^2$, on a measure of revenue diversification, and proxies for risk, profitability, and size before and after deal announcements where banks bid for insurance companies (Bank-Insure), insurance agencies/brokers (Bank-Agency) and securities/commodities brokers (Bank-Securities). The sample period is 1991 to 2012. Panels A and B present the results from separate estimations of equation [4] when the dependent variable is market beta or idiosyncratic risk. Within each Panel, the Table presents estimations for each subsample using pre-announcement and post-announcement data. The first column identifies the independent variables. DR is a dummy variable equal to one when bank pre-announcement total risk is above the median value of the pertinent sample and zero otherwise. Non-interest income share is proxy for revenue diversification and equals the percentage of non-interest income-to-total operating income. Loan loss provision ratio is proxy for loan risk and equals the percentage of loan loss provisions-to-total assets. We specify three bank-specific characteristics as control variables; ROA, leverage, and firm size. ROA is the percentage of net income-to-total assets; Leverage is the percentage of total assets-to-common equity; and firm size is the natural logarithm of total assets. In cases where independent variables are correlated with one another, we use auxiliary regressions to make them orthogonal. We source all balance sheet and income statement variables at year-end prior to and after each announcement. Figures in brackets show t-values (White errors). a/b/c denote statistical significance at the 1%, 5% and 10%, respectively.

[1]All betas are multiplied by 10^4.

Table 10. Market beta and idiosyncratic risk regressions: Diversification interactions

$$Y_{j,i} = \alpha + \beta_1 DD + \beta_2 DIV_{k,i} + \beta_3 LL_{h,i} + \beta_4 ROA_i + \beta_5 LEV_i + \beta_6 Size_i + DD \times \left(\beta_7 DIV_{k,i} + \beta_8 LL_{h,i} + \beta_9 ROA_i + \beta_{10} LEV_i + \beta_{11} Size_i\right) + \varepsilon_i$$

	Bank-Insure		Bank-Agency		Bank-Securities	
	Before	**After**	**Before**	**After**	**Before**	**After**
Panel A: Market Beta						
Constant	0.369	0.685	-0.149	0.405	-1.311	0.925
	(1.95)[c]	(3.43)[a]	-(0.48)	(1.97)[c]	-(1.41)	(3.36)[a]
DD	0.078	0.267	0.001	0.472	0.754	0.402
	(0.30)	(0.87)	(0.00)	(0.85)	(0.63)	(1.18)
Non-interest income share	1.821	0.163	4.036	0.117	-0.104	0.617
	(1.65)	(0.20)	(1.70)[c]	(0.15)	-(0.10)	(0.76)
Loan loss provision ratio	6.681	9.992	-0.222	66.508	18.664	16.461
	(0.72)	(1.14)	(0.00)	(3.86)[a]	(1.13)	(1.04)
ROA	-0.012	-0.210	0.075	-0.175	0.072	-0.072
	-(0.26)	-(2.28)[b]	(0.59)	-(1.59)	(0.90)	-(0.71)
Leverage	0.010	0.005	0.003	0.006	-0.009	-0.010
	(2.48)[b]	(1.75)[c]	(0.40)	(1.17)	-(1.29)	-(2.20)[b]
Firm size	0.122	0.082	0.101	0.149	0.088	0.074
	(4.68)[a]	(2.92)[a]	(1.65)	(4.08)[a]	(2.48)[b]	(2.23)[b]
DD × Non-interest income share	-1.072	0.070	-3.203	-0.369	0.950	-0.398
	-(0.94)	(0.08)	-(1.30)	-(0.38)	(0.84)	-(0.46)
DD × Loan loss provision ratio	3.601	36.221	20.463	-99.834	-31.126	-25.868
	(0.26)	(1.80)[c]	(0.35)	-(1.05)	-(1.78)[c]	-(1.46)
DD × ROA	0.031	0.051	0.145	0.372	-0.008	0.036
	(0.34)	(0.42)	(0.70)	(1.21)	-(0.09)	(0.28)
DD × Leverage	0.000	-0.019	0.021	0.008	-0.002	-0.001
	(0.01)	-(2.28)[b]	(0.65)	(0.30)	-(0.26)	-(0.20)
DD × Firm size	-0.003	-0.049	-0.017	-0.122	-0.029	0.011
	-(0.08)	-(0.98)	-(0.24)	-(2.18)[b]	-(0.64)	(0.22)
N	105	91	82	77	49	49
Adjusted R-squared	0.31	0.17	0.18	0.15	0.33	0.40
F-statistic	5.15	2.67	2.61	2.19	3.17	3.87
Panel B: Idiosyncratic Risk[1]						
Constant	6.380	0.624	2.690	5.130	-8.330	-1.040
	(3.86)[a]	(0.38)	(0.58)	(3.56)[a]	-(5.07)[a]	-(0.31)
DD	-5.830	0.970	-1.910	-1.960	6.280	-1.090
	-(3.03)[a]	(0.53)	-(0.36)	-(0.75)	(2.06)[b]	-(0.27)
Non-interest income share	-14.670	4.030	21.280	-18.480	-4.120	9.660
	-(1.51)	(0.53)	(0.74)	-(2.81)[a]	-(1.54)	(1.12)
Loan loss provision ratio	127.410	520.030	-772.390	797.620	2.110	80.630
	(2.21)[b]	(3.37)[a]	-(0.92)	(5.92)[a]	(0.05)	(0.60)
ROA	-0.282	0.716	0.858	2.010	0.093	-0.125
	-(1.05)	(1.21)	(0.42)	(2.17)[b]	(0.56)	-(0.15)
Leverage	-0.076	-0.013	-0.014	0.004	-0.033	0.048
	-(2.67)[a]	-(0.48)	-(0.19)	(0.07)	-(2.60)[b]	(0.95)
Firm size	-0.353	-0.340	-2.690	-0.989	0.409	0.326
	-(2.15)[b]	-(1.10)	-(1.62)	-(2.79)[a]	(5.82)[a]	(1.20)
DD × Non-interest income share	15.910	-7.450	-20.630	17.010	4.570	2.610
	(1.63)	-(0.94)	-(0.71)	(2.38)[b]	(1.48)	(0.25)
DD × Loan loss provision ratio	37.140	-191.940	895.590	-598.870	329.420	57.700
	(0.43)	-(0.72)	(1.04)	-(1.68)[c]	(5.06)[a]	(0.37)
DD × ROA	-0.218	-0.580	-0.542	-2.320	0.875	-1.820
	-(0.48)	-(0.70)	-(0.25)	-(1.63)	(3.27)[a]	-(1.41)
DD × Leverage	0.115	0.074	0.039	-0.046	0.020	0.012
	(2.51)[b]	(1.13)	(0.23)	-(0.26)	(1.07)	(0.15)
DD × Firm size	0.310	0.024	2.570	0.587	-0.300	-1.640

	(1.43)	(0.06)	(1.54)	(1.21)	-(2.51)[b]	-(2.62)[b]
N	105	91	82	77	49	51
Adjusted R-squared	0.26	0.40	0.13	0.30	0.68	0.18
F-statistic	4.29	6.50	2.08	3.93	10.28	1.95

The Table presents OLS regressions of bank market beta, β, and bank idiosyncratic risk, $\sigma_{\varepsilon_i}^2$, on a measure of revenue diversification, and proxies for risk, profitability, and size before and after deal announcements where banks bid for insurance companies (Bank-Insure), insurance agencies/brokers (Bank-Agency) and securities/commodities brokers (Bank-Securities). The sample period is 1991 to 2012. Panels A and B present the results from separate estimations of equation [4] when the dependent variable is market beta or idiosyncratic risk. Within each Panel, the Table presents estimations for each subsample using pre-announcement and post-announcement data. The first column identifies the independent variables. DD is a dummy variable equal to one when bank pre-announcement non-interest income share is above the median value of the pertinent sample and zero otherwise. Non-interest income share is proxy for revenue diversification and equals the percentage of non-interest income-to-total operating income. Loan loss provision ratio is proxy for loan risk and equals the percentage of loan loss provisions-to-total assets. We specify three bank-specific characteristics as control variables; ROA, leverage, and firm size. ROA is the percentage of net income-to-total assets; Leverage is the percentage of total assets-to-common equity; and firm size is the natural logarithm of total assets. In cases where independent variables are correlated with one another, we use auxiliary regressions to make them orthogonal. We source all balance sheet and income statement variables at year-end prior to and after each announcement. Figures in brackets show t-values (White errors). a/b/c denote statistical significance at the 1%, 5% and 10%, respectively.

[1]All betas are multiplied by 10^4.

Appendix Table A1. List of Deals

Date Announced	Acquiring Bank	Nationality	Assets (USD mil.)	Target	Nationality	Type
18/01/1991	Valley National Bank	United States	2004.2	Western Security Life Insurance Co	United States	B - IU
09/04/1991	Philippine National Bank	Philippines	-	Philippine Charter Insurance Corp	Philippines	B - IU
24/04/1991	Schweizerischer Bankverein	Switzerland	147072.8	Lippo Securities PT	Indonesia	B - SF
26/09/1991	Abbey National Plc	United Kingdom	89737.3	Scottish Mutual Intl Plc	Ireland	B - IU
10/12/1991	BHF Bank KGaA	Germany	25897.3	Financiere Atlas SA	France	B - SF
30/04/1992	Credit Commercial de France	France	56286.2	Cie Financiere Nobel	France	B - SF
01/09/1992	Deutsche Bank AG	Germany	294806.6	Deutscher Herold Versicherungs	Germany	B - IU
14/09/1992	Mellon Bank Corp,Pittsburgh,PA	United States	29355.0	Boston Co	United States	B - SF
30/11/1992	BB&T Financial Corp	United States	3729.7	West Insurance & Associates	United States	B - IU
27/04/1993	First Bank System Inc	United States	23527.0	American Bancshares of Mankato Inc	United States	B - IU
29/04/1993	BB&T Financial Corp	United States	4598.4	Wilkinson Bullock & Co	United States	B - IA
01/06/1993	CERUS SA	France	2163.0	Societe Financiere de Geneve	Switzerland	B - SF
25/06/1993	BB&T Financial Corp	United States	4598.4	Ralph Carlton Insurance Agency Inc	United States	B - IA
27/09/1993	Metropolitan Financial Corp	United States	23527.0	Rocky Mountain Financial Corp	United States	B - IA
08/12/1993	Commerzbank AG	Germany	143066.9	DBV Holding AG	Germany	B - IU
29/04/1994	BB&T Financial Corp	United States	5898.4	Cummings LeGrand Insurance Agency Inc	United States	B - IA
21/06/1994	Banca Popolare di Bergamo	Italy	14325.3	Mare Assicurazioni	Italy	B - IU
29/06/1994	Den Danske Bank AS	Denmark	52377.2	Baltica Forsikring A/S	Denmark	B - IU
21/09/1994	CNB Bancshares Inc	United States	-	Citizens Realty and Insurance Inc	United States	B - IU
20/10/1994	Bank of Nova Scotia	Canada	81119.3	Glacier National Life Assurance	United States	B - IU
06/02/1995	Abbey National Plc	United Kingdom	147562.1	Pegasus Assurance Group	United Kingdom	B - IU
21/02/1995	First Financial Bancorp	United States	1916.7	Independent Bankers Life Insurance Co	United States	B - IU
15/05/1995	Den Norske Banken ASA	Norway	22821.7	Vital Forsikring A/S	Norway	B - IU
23/05/1995	Den Danske Bank AS	Denmark	55527.1	Danica	Denmark	B - IU
26/06/1995	Dresdner Bank AG	Germany	257631.9	Kleinwort Benson Group PLC	United Kingdom	B - SF
23/10/1995	Mellon Bank Corp,Pittsburgh,PA	United States	38644.0	KeyCorp Cleveland, Ohio-Bond	United States	B - SF
06/11/1995	Bank of Nova Scotia	Canada	97954.9	Canada Security Assurance Co	Canada	B - IU
01/12/1995	Dresdner Bank AG	Germany	257631.9	RCM Capital Management LLC	United States	B - SF
26/01/1996	Canadian Western Bank	Canada	989.3	Aetna Trust Co	Canada	B - IU
31/01/1996	Community First Bankshares Inc	United States	2326.8	Wheaton Insurance Agency Inc	United States	B - IA
28/03/1996	First American Corp,Tennessee	United States	9681.6	Invest Financial Corp	United States	B - SF
09/04/1996	First of America Bank Corp	United States	-	Huttenlocher Group	United States	B - IA
25/07/1996	Westpac Banking Corp	Australia	79017.3	AMPAC Life	Australia	B - IU
01/08/1996	Commerce Bancorp Inc	United States	2415.9	Buckelew & Associates, Keystone National Insurance	United States	B - IU
29/10/1996	Pinnacle Financial Services Inc	United States	220.6	Starke's Inc	United States	B - IA
22/11/1996	Commerce Bancorp Inc	United States	2415.9	Morrissey Agency	United States	B - IA
29/11/1996	Bank of Nova Scotia	Canada	109075.3	Mortgage Insurance Company of Canada	Canada	B - IU
03/01/1997	Zions Bancorp	United States	6485.0	Mutual Benefit Life Insurance	United States	B - IA

22/04/1997	Fort Wayne National Corp	United States	-	Ambassador Group Inc	United States	B - IU
20/05/1997	Banca Carige SpA	Italy	11692.8	Norditalia Assicurazioni SpA	Italy	B - IU
20/05/1997	Banca Carige SpA	Italy	11692.8	La Basilese Compagnia d'Assicurazioni sulla Vita	Switzerland	B - IU
20/05/1997	Banca Carige SpA	Italy	11692.8	Basilese Vita Nova SpA	Italy	B - IU
01/07/1997	Royal Bank of Scotland Group	United Kingdom	117199.8	Computershare Ltd	Australia	B - SF
11/08/1997	Credit Suisse Group	Switzerland	388921.9	Winterthur Schweizerische	Switzerland	B - IU
25/08/1997	Mellon Bank Corp,Pittsburgh,PA	United States	42596.0	Pacific Brokerage Services Inc	United States	B - SF
02/10/1997	Skandinaviska Enskilda Banken	Denmark	80642.3	Trygg-Hansa Forsakrings AB	Denmark	B - IU
14/10/1997	Bank of Ireland	Ireland	33013.7	New Ireland Holdings PLC	Ireland	B - IU
30/11/1997	Centura Bank Inc	United States	6292.4	Betts & Co	United States	B - IU
11/12/1997	Mellon Bank Corp,Pittsburgh,PA	United States	42596.0	Founders Asset Management Inc	United States	B - SF
13/01/1998	Royal Bank of Canada	Canada	173105.3	Mutual of Omaha-Canadian Life	Canada	B - IU
24/03/1998	WesBanco Inc	United States	1789.3	Hunter Insurance Agency	United States	B - IA
06/04/1998	Citicorp	United States	308678.0	Travelers Group	United States	B - IU
13/04/1998	Hibernia Corp	United States	10992.4	FPS Financial Services	United States	B - IU
28/04/1998	Webster Financial Corp	United States	7003.3	Damman Insurance Associates	United States	B - IA
26/05/1998	Colonial Ltd	Australia	22314.8	Legal & General Australia Ltd	Australia	B - IU
01/07/1998	Commerce Bancorp Inc	United States	3939.0	JA Montgomery Inc	United States	B - IA
17/08/1998	Colonial Ltd	Australia	22314.8	Prudential Corp AU/NZ Ops	Australia	B - IU
24/09/1998	Colonial Ltd	Australia	22314.8	Guardian Assurance PLC - Hong Kong Operations	Hong Kong	B - IU
29/09/1998	Haven Bancorp	United States	1968.7	Century Insurance Agency	United States	B - IA
02/11/1998	First Defiance Financial Corp	United States	579.3	Insurance Center of Defiance Inc	United States	B - IA
17/12/1998	UST Corp	United States	-	Brewer & Lord LLP	United States	B - IA
01/01/1999	Dexia SA	Belgium	123776.6	Sofaxis	France	B - IU
09/02/1999	BIL SA	Luxembourg	-	Versicherung Rekord	Germany	B - IA
10/03/1999	Unidanmark A/S	Denmark	70261.5	Tryg-Baltica Forsikring	Denmark	B - IU
15/03/1999	Sky Financial Group Inc	United States	-	Picton Cavanaugh Inc	United States	B - IA
23/03/1999	Bank of New York Co Inc,NY	United States	63503.0	RBSI Sec Svcs(Hldgs)Ltd	Jersey	B - SF
26/04/1999	BancorpSouth Inc	United States	5177.6	Stewart Sneed Hewes Group	United States	B - IU
30/04/1999	Banco Bilbao Vizcaya SA	Spain	155327.8	Adeslas Argentina	Argentina	B - IU
20/05/1999	First United Corp	United States	641.1	Gonder Insurance Agency	United States	B - IA
07/06/1999	Banco Santander Central Hispano	Spain	181028.3	Cia de Seguros Mundial Confianca	Portugal	B - IU
23/06/1999	Lloyds TSB Group	United Kingdom	-	Scottish Widows	United Kingdom	B - IU
24/06/1999	FNB Corp	United States	461.1	Gelvin Jackson & Starr Inc	United States	B - IA
08/07/1999	Wachovia Corp	United States	237363.0	Barry Evans Josephs & Snipes Inc	United States	B - IU
14/07/1999	BB&T Corp	United States	34427.2	Beam Cooper Gainey & Associates Inc	United States	B - IA
15/07/1999	San Paolo IMI	Italy	185848.3	Egida Cie di Assicurazioni e Riassicurazioni SpA	Italy	B - IU
29/07/1999	Hellenic Bank PCL	Cyprus	-	Ledra Insurance Ltd	Cyprus	B - IU
19/09/1999	Dexia SA	Belgium	116264.2	Dexia France	France	B - SF
28/09/1999	Chase Manhattan Corp,NY	United States	626942.0	Hambrecht & Quist Group Inc	United States	B - SF
28/10/1999	FNB Corp	United States	461.1	Roger Bouchard Insurance Inc	United States	B - IA

02/11/1999	Peoples Bancorp Inc	United States	880.3	Lambert Insurance Agency	United States	B - IA
02/12/1999	Dexia SA	Belgium	116264.2	Dexia France(Dexia Belgium)	France	B - SF
16/12/1999	Univest Corp of Pennsylvania	United States	1070.5	George Becker Associates	United States	B - IA
31/12/1999	Unidanmark A/S	Denmark	70261.5	Vesta Forsikring AS	Norway	B - IU
11/01/2000	Banco Comercial Portugues SA	Portugal	35136.1	Imperio Seguros	Portugal	B - IU
19/01/2000	BPI	Philippines	5681.9	Ayala Insurance Holdings Ltd	Philippines	B - IU
19/01/2000	Sofinloc	Portugal	-	Contratecar	Portugal	B - IA
08/02/2000	Dexia SA	Belgium	245887.3	Dexia France (Dexia Belgium)	France	B - SF
14/03/2000	Dexia SA	Belgium	244948.3	Labouchere NV	Netherlands	B - IU
14/03/2000	Dexia SA	Belgium	244948.3	Financial Security Assurance Holdings Ltd	United States	B - IU
15/03/2000	Dexia SA	Belgium	244948.3	White Mountains Holdings	United States	B - IA
06/04/2000	Webster Financial Corp	United States	9863.0	Folis Wylie & Lane	United States	B - IA
25/04/2000	Oneida Financial Corp	United States	277.7	Bailey & Haskell Associates Inc	United States	B - IA
01/05/2000	Republic Security Financial Corp	United States	3175.6	National Horizon Inc	United States	B - IU
30/05/2000	Hibernia Corp	United States	15240.9	Rosenthal Agency	United States	B - IA
07/06/2000	Kredyt Bank PBI SA	Poland	3875.7	Agropolisa SA	Poland	B - IU
20/06/2000	Royal Bank of Canada	Canada	183593.0	Liberty Life Insurance Co	United States	B - IU
20/07/2000	Natexis Banques Populaires	France	94953.8	FACTOREM	France	B - SF
01/08/2000	FNB Corp	United States	515.3	Atlamura Marsh & Associates	United States	B - IA
22/08/2000	East West Bancorp Inc	United States	2144.3	East West Insurance Agency	United States	B - IA
25/08/2000	Huntington Bancshares Inc	United States	29037.0	J Rolfe Davis Insurance Agency Inc	United States	B - IA
07/09/2000	Abbey National Plc	United Kingdom	291305.1	Scottish Provident Institution	United Kingdom	B - IU
10/10/2000	BancorpSouth Inc	United States	5776.9	Pittman Seay & Turner Insurance Agency	United States	B - IA
12/10/2000	Deutsche Bank AG	Germany	832885.2	National Discount Brokers	United States	B - SF
24/10/2000	Compass Bancshares Inc	United States	18150.8	Texas Insurance Agency	United States	B - IA
20/11/2000	BancFirst Corp	United States	2335.8	Century Life Assurance Co	United States	B - IA
20/12/2000	Svenska Handelsbanken AB	Sweden	108017.8	SPP Livforsakring AB	Sweden	B - IU
28/12/2000	Banco Bilbao Vizcaya Argentaria SA (BBVA)	Spain	154886.6	Hilo Direct Seguros Y Reaseguros SA	Spain	B - IU
01/01/2001	Citigroup Inc	United States	902210.0	Generar AFJP	Argentina	B - IU
05/02/2001	KBC Bank & Insurance Holding NV	Belgium	176183.3	K&H Eletbiztosito	Hungary	B - IU
08/02/2001	Regions Financial Corp	United States	43688.3	Rebsamen Insurance Inc	United States	B - IU
28/02/2001	Sterling Bancorp	United States	1264.4	American Sterling Corp	United States	B - IU
09/03/2001	Wells Fargo & Co	United States	272426.0	ACO Brokerage Holdings Corp	United States	B - IA
01/05/2001	Mellon Financial Corp	United States	50364.0	Bankmark	United States	B - IA
22/05/2001	Dexia SA	Belgium	242133.6	Kempen & Co NV	Netherlands	B - SF
30/05/2001	First Bancorp	United States	914.4	Aberdeen Insurance & Realty Co Inc	United States	B - IU
30/05/2001	First Bancorp	United States	914.4	Hobbs Insurance & Realty Co	United States	B - IU
15/06/2001	Suncorp-Metway Ltd	Australia	15673.4	AMP General Insurance Ltd	Australia	B - IU
05/07/2001	Societe Generale SA	France	428005.4	La Marocaine-Vie	Morocco	B - IU
06/07/2001	Banca Monte dei Paschi di Siena SpA	Italy	101006.6	Dipras SpA	Italy	B - IU
01/10/2001	Sussex Bancorp	United States	161.2	Tri-State Insurance Agency	United States	B - IA
10/10/2001	Toronto-Dominion Bank	Canada	181326.7	TD Waterhouse Group Inc	United States	B - SF

05/11/2001	BB&T Corp	United States	59340.2	Cooney Rikard & Curtin Inc	United States	B - IA
15/11/2001	Wachovia Corp	United States	254170.0	Crawford Slevin & Hicks	United States	B - IU
30/11/2001	Den Norske Bank Holding ASA	Norway	39000.2	Acta Link	Norway	B - IA
03/12/2001	Univest Corp of Pennsylvania	United States	1204.2	Gum Insurance	United States	B - IA
19/12/2001	Greater Bay Bancorp	United States	5130.4	ABD Insurance & Financial Svcs	United States	B - IU
09/01/2002	Compass Bancshares Inc	United States	23015.0	Horizons Insurance Group Inc	United States	B - IA
22/01/2002	Hana Bank	South Korea	16974.6	Allianz France Life Insurance Co	South Korea	B - IU
30/01/2002	Sky Financial Group Inc	United States	-	Celaris Group Inc	United States	B - IA
28/03/2002	BNCcorp	United States	585.1	Milne Scali & Co	United States	B - IU
02/04/2002	Hibernia Corp	United States	16596.8	Friedler-LaRocca Financial	United States	B - IU
30/04/2002	Royal Bank of Canada	Canada	225742.4	Business Men's Assurance	United States	B - IU
30/04/2002	Susquehanna Bancshares Inc	United States	5051.1	Addis Group Inc	United States	B - IU
01/05/2002	Regions Financial Corp	United States	45382.7	ICT Group LLC	United States	B - IA
10/06/2002	Main Street Banks Inc	United States	1110.2	Hometown Insurance Center Inc	United States	B - IU
18/06/2002	Valley National Bancorp	United States	8566.0	Masters Coverage Corp	United States	B - IA
01/07/2002	Trustmark Corp	United States	7167.5	Chandler-Sampson Insurance Inc	United States	B - IU
01/08/2002	Community First Bankshares Inc	United States	5772.3	Hake Agency	United States	B - IA
02/08/2002	Wachovia Corp	United States	330452.0	Cameron M Harris & Co	United States	B - IA
15/08/2002	First Financial Holdings Inc	United States	2325.7	Johnson Insurance Associates Inc	United States	B - IU
04/09/2002	Second Bancorp Inc	United States	1680.4	Stouffer Herzog	United States	B - IU
11/09/2002	FNB Corp	United States	953.3	Harry Blackwood Inc	United States	B - IA
24/09/2002	South Financial Group Inc	United States	6029.4	Gardner Associates Inc	United States	B - IA
25/09/2002	Waypoint Financial Corp	United States	5372.2	Keystone Future Care	United States	B - IA
25/09/2002	Waypoint Financial Corp	United States	5372.2	Insurance Brokers of York	United States	B - IA
01/10/2002	Leesport Financial Corp	United States	503.5	Boothby Group	United States	B - IU
02/10/2002	BB&T Corp	United States	70869.9	Landrum-Yaeger & Associates Inc	United States	B - IA
09/10/2002	First Bancorp	United States	1144.4	Uwharrie Insurance Group Inc	United States	B - IA
23/10/2002	Old National Bancorp	United States	9080.5	Terrill Group Inc	United States	B - IA
19/12/2002	Team Financial Inc	United States	650.3	Quarles Insurance Agency	United States	B - IA
23/12/2002	Community Banks Inc	United States	1509.7	Shultz Insurance Agency Inc	United States	B - IA
16/01/2003	Sussex Bancorp	United States	225.9	Garrera Insurance Agency	United States	B - IA
12/03/2003	Compass Bancshares Inc	United States	23884.7	Mueller & Associates Inc	United States	B - IA
24/03/2003	First Financial Holdings Inc	United States	2264.7	Woodruff & Co Inc	United States	B - IA
01/04/2003	Associated Banc-Corp	United States	15043.3	CFG Insurance Services Inc	United States	B - IU
10/04/2003	Old National Bancorp	United States	9612.6	James L Will Insurance Agency Inc	United States	B - IA
22/04/2003	Sun Bancorp Inc	United States	2105.3	Mid Penn Insurance Associates Inc	United States	B - IA
30/04/2003	BancorpSouth Inc	United States	10189.2	WMS LLC	United States	B - IA
30/05/2003	Bank One Corp	United States	277383.0	Zurich Life	United States	B - IU
11/06/2003	Royal Bank of Scotland Group PLC	United Kingdom	663278.8	Churchill Insurance Co Ltd	United Kingdom	B - IU
26/06/2003	FNB Corp	United States	992.3	Lupfer-Frakes Insurance	United States	B - IU
02/07/2003	SanPaolo IMI SpA	Italy	211937.9	Noricum Vita	Italy	B - IU
03/07/2003	Community Banks Inc	United States	1679.9	Your Insurance Partner	United States	B - IU
07/07/2003	Sky Financial Group Inc	United States	-	Insurance Buyers' Service Agency Inc	United States	B - IA
10/07/2003	Old National Bancorp	United States	9612.6	Insurance & Risk Management	United States	B - IA
14/07/2003	BancorpSouth Inc	United States	10189.2	Ramsey Krug Farrell & Lensing Inc	United States	B - IA

25/07/2003	Hudson United Bancorp	United States	7651.3	Flatiron Credit Co Inc	United States	B - IA
08/08/2003	Hancock Holding Co	United States	3973.1	Magna Insurance Co	United States	B - IU
14/08/2003	Oneida Financial Corp	United States	416.7	MacDonald Yando Agency Inc	United States	B - IA
27/08/2003	Kookmin Bank	South Korea	-	Hanil Life Insurance	South Korea	B - IU
31/08/2003	Punjab National Bank	India	18560.8	Principal PNB Asst Mgmt Co Ltd	India	B - SF
02/09/2003	German American Bancorp	United States	957.0	Hoosierland Agency	United States	B - IA
02/09/2003	German American Bancorp	United States	957.0	Stafford Williams Agency	United States	B - IA
24/09/2003	Leesport Financial Corp	United States	562.4	CrosStates Insurance Consultants Inc	United States	B - IA
29/09/2003	Regions Financial Corp	United States	47938.8	Merchants Insurance Services Inc	United States	B - IA
01/10/2003	Community First Bankshares Inc	United States	5827.2	Summit Insurance Group	United States	B - IA
21/10/2003	Banco Itau Holding Financeira SA	Brazil	30313.2	AGF Brazil (Life and Asset Mngmt Units)	Brazil	B - IU
05/12/2003	Main Street Banks Inc	United States	1382.0	Banks Moneyhan Hayes Insurance	United States	B - IU
05/01/2004	Sky Financial Group Inc	United States	-	Spencer Patterson Agency Inc	United States	B - IA
13/01/2004	Sterling Financial Corp	United States	-	Corporate Healthcare Strategies	United States	B - IA
02/02/2004	First Financial Holdings Inc	United States	2322.9	Kimbrell Insurance Group	United States	B - IU
13/02/2004	San Paolo IMI	Italy	253487.7	Fideuram Vita SpA	Italy	B - IU
18/02/2004	Royal Bank of Scotland Group PLC	United Kingdom	815010.5	SOC Group PLC-SOCM Unit	United Kingdom	B - IU
01/03/2004	Summit Financial Group Inc	United States	791.5	Sager Insurance Agency	United States	B - IA
02/03/2004	Canadian Western Bank	Canada	3289.5	HSBC Canadian Direct Insurance Inc	Canada	B - IU
03/03/2004	First Financial Bancorp	United States	3949.8	White & Havens Insurance Services	United States	B - IA
01/04/2004	Sky Financial Group Inc	United States	-	EOB Inc	United States	B - IA
01/07/2004	Svenska Handelsbanken AB	Sweden	175178.3	SPP Fondforsakring AB	Sweden	B - IU
01/07/2004	National Penn Bancshares Inc	United States	3510.8	Pennsurance Inc	United States	B - IA
09/07/2004	UBS AG	Switzerland	1247800.0	Giubergia UBS SIM SpA	Italy	B - SF
26/07/2004	FNB Corp	United States	1325.5	Morrell Butz & Junker Inc	United States	B - IA
07/09/2004	Mellon Financial,Pittsburgh,PA	United States	33983.0	Providence Group Investment	United States	B - SF
06/10/2004	Compass Bancshares Inc	United States	26963.1	Sevier Insurance Agency	United States	B - IA
02/11/2004	Trustmark Corp	United States	7891.0	Fisher-Brown Inc	United States	B - IA
02/12/2004	Landesbank Berlin Holding AG	Germany	191032.4	MLP AG	Germany	B - SF
08/12/2004	National Penn Bancshares Inc	United States	3510.8	D E Love Associates Inc	United States	B - IA
14/12/2004	Univest Corp of Pennsylvania	United States	1657.2	Donald K Martin & Co	United States	B - IU
03/01/2005	S&T Bancorp Inc	United States	2989.0	Cowhernehrig & Co	United States	B - IA
03/01/2005	S&T Bancorp Inc	United States	2989.0	Bennett Associates Inc	United States	B - IA
10/01/2005	UBS AG	Switzerland	1523000.0	Etra SIM SpA	Italy	B - SF
11/01/2005	UBS AG	Switzerland	1523000.0	China Dragon Fund Mgmt Co Ltd	China	B - SF
13/01/2005	Compass Bancshares Inc	United States	28184.6	Warren Benefits Group LP	United States	B - IA
11/02/2005	FoereningsSparbanken AB	Sweden	153677.9	AS Hansapank	Estonia	B - SF
18/02/2005	Bancolombia SA	Colombia	7422.9	Corfinsura	Colombia	B - SF
03/03/2005	Liu Chong Hing Bank Ltd	Hong Kong	5417.8	Liu Chong Hing Insurance Co Ltd	Hong Kong	B - IU
11/03/2005	ICICI Bank Ltd	India	40789.5	Prudential ICICI Asset Mgmt Co	India	B - SF
30/03/2005	Royal Bank of Scotland Group	United Kingdom	1335100.0	ASK Finance Ltd	United Kingdom	B - SF
30/03/2005	Royal Bank of Scotland Group	United Kingdom	1335100.0	FS Compliance Ltd	United Kingdom	B - SF
01/04/2005	BancorpSouth Inc	United States	10848.2	Kyzar & Co	United States	B - IU
01/04/2005	Old National Bancorp	United States	8898.3	JWF Insurance Cos Inc	United States	B - IU

05/04/2005	Wachovia Corp	United States	493324.0	Palmer & Cay Inc	United States	B - IA
27/04/2005	Thai Military Bank PCL	Thailand	17227.0	Macquarie Sec(Thailand)Ltd	Thailand	B - SF
19/05/2005	Regions Financial Corp	United States	84106.4	Galbreath Insurance Agency	United States	B - IA
06/06/2005	South Financial Group Inc	United States	13789.8	Bowditch Insurance Corp	United States	B - IU
18/06/2005	DBS Group Holdings Ltd	Singapore	107582.2	CIFCL	India	B - SF
12/09/2005	OKO Bank	Finland	22328.8	Pohjola-Yhtyma Oyj	Finland	B - IU
28/09/2005	UBS AG	Switzerland	1523000.0	Beijing Securities Co Ltd	China	B - SF
04/10/2005	Sky Financial Group Inc	United States	-	Becker-McDowell Agency Inc	United States	B - IU
04/10/2005	Sky Financial Group Inc	United States	-	Steiner Insurance Agency Inc	United States	B - IU
07/10/2005	Alliance Bancshares Corp	United States	479.7	Danaher Insurance Agency	United States	B - IA
13/10/2005	Enterprise Financial Services Corp	United States	1055.2	Millenium Brokerage Group	United States	B - IA
22/11/2005	TD Banknorth Inc	United States	28566.3	Boothby & Bartlett Co	United States	B - IA
02/12/2005	South Financial Group Inc	United States	13789.8	Lossing Insurance Agency Inc	United States	B - IU
03/03/2006	Credit Suisse Group AG	Switzerland	1018100.0	Woori F&I Co Ltd	South Korea	B - SF
23/06/2006	Banco Popolare di Verona & Novara SpA	Italy	70084.3	ABC Assicura	Italy	B - IU
27/06/2006	Fortis SA/NV	Belgium	-	Cinergy Marketing & Trading LP	United States	B - SF
29/06/2006	Oversea-Chinese Bkg Corp Ltd	Singapore	81019.1	Great Eastern Holdings Ltd	Singapore	B - IU
29/06/2006	First Financial Holdings Inc	United States	2522.4	Employer Benefits Strategies Inc	United States	B - IA
04/09/2006	Credit Agricole SA	France	1256000.0	Phoenix Metrolife Emporiki	Greece	B - IU
10/10/2006	Beneficial Mutual Bancorp Inc	United States	2300.2	CLA Agency Inc	United States	B - IA
31/10/2006	Fortis SA/NV	Belgium	-	Gutingia Lebensversicherung AG	Germany	B - IU
14/12/2006	Hanmi Financial Corp	United States	3413.2	All World Insurance Svcs Inc	United States	B - IA
26/01/2007	UKIO Bankas AB	Lithuania	1223.3	Bonum Publicum	Lithuania	B - IU
19/02/2007	ANZ Banking Group Ltd	Australia	347918.3	eTrade Australia Ltd	Australia	B - SF
26/02/2007	JPMorgan Chase & Co	United States	1351520.0	Integrated Investment Services	United States	B - SF
12/05/2007	Doha Bank(QSC)	Qatar	5959.5	Select Securities Ltd	India	B - SF
09/07/2007	Hiroshima Bank Ltd	Japan	52489.0	Utsumiya Securities-Retail	Japan	B - SF
20/08/2007	DnB NOR ASA	Norway	211411.2	SalusAnsvar AB	Sweden	B - IU
24/09/2007	National Bank of Greece SA	Greece	100987.7	Ethniki General Insurance Co	Greece	B - IU
02/10/2007	Shore Bancshares Inc	United States	945.6	TSGIA Inc & Subsidiaries	United States	B - IU
02/10/2007	Shore Bancshares Inc	United States	945.6	Jack Martin & Associates Inc	United States	B - IU
19/12/2007	Abu Dhabi Commercial Bank PJSC	Utd Arab Em	22077.5	RHB Capital Bhd	Malaysia	B - SF
31/12/2007	Enterprise Finl Svcs Corp	United States	1535.6	Millenium Brokerage Group	United States	B - IA
10/01/2008	Deutsche Bank AG	Germany	2946300.0	BATS Global Markets Inc	United States	B - SF
14/01/2008	Wachovia Corp,Charlotte,NC	United States	782896.0	Heritage Indemnity Co	United States	B - IU
28/05/2008	Standard Bank Group Ltd	South Africa	172283.9	Libhold	South Africa	B - IU
05/06/2008	Kas Bank NV	Netherlands	12208.6	Delta Lloyd Investment	Germany	B - SF
07/07/2008	Banco do Brasil SA	Brazil	201096.3	Cia de Seguros Alianca	Brazil	B - IU
26/08/2008	Latvijas Krajbanka AS	Latvia	1404.2	Balta Insurance Co	Latvia	B - IU
27/08/2008	Bank of Yokohama Ltd	Japan	120063.3	Hamagin Tokai Tokyo Securities	Japan	B - SF
10/09/2008	Bumiputra-Commerce Hldg Bhd	Malaysia	59852.8	Asuransi Jiwa John Hancock	Indonesia	B - IU
17/09/2008	Solomon Mutual Savings Bank	South Korea	3417.4	Green Fire Marine Insurance Co	South Korea	B - IU
23/09/2008	Banca Popolare di Milano SCARL	Italy	63621.3	Anima SGR SpA	Italy	B - SF
08/10/2008	Commonwealth Bank of Australia	Australia	466557.6	St Andrew's Australia Pty Ltd	Australia	B - IU
03/11/2008	Banco Itau Holding Financeira	Brazil	165753.9	Banco Itau Europa SA	Portugal	B - SF

18/12/2008	ICBC(Asia)	Hong Kong	24655.9	Tai Ping Insurance Co Ltd	China	B - IU
13/01/2009	Bank of Montreal,Ontario,CA	Canada	359284.1	AIG Life Ins Co of Canada	Canada	B - IU
17/07/2009	Banca Popolare di Milano SCARL	Italy	62842.5	Bipiemme Vita SpA	Italy	B - IU
22/10/2009	HSBC	United Kingdom	2527500.0	Bao Viet Holdings	Vietnam	B - IU
25/03/2010	Nishi-Nippon City Bank Ltd	Japan	77995.4	Nishi-Nippon City TT Securitie	Japan	B - SF
23/06/2010	Punjab National Bank	India	67534.9	Principal PNB Life Insurance	India	B - IU
18/01/2011	TowneBank,Portsmouth,Virginia	United States	3871.0	WT Chapin Insurance	United States	B - IU
28/03/2011	Chinatrust Financial Holding	Taiwan	5446.4	MetLife Taiwan Insurance Co	Taiwan	B - IU
29/03/2011	Industrial Bank Co Ltd	China	280691.6	Union Trust Ltd	China	B - SF
19/05/2011	Siam Commercial Bank PCL	Thailand	49134.4	SICCO Securities PCL	Thailand	B - SF
06/06/2011	Kiatnakin Bank PCL	Thailand	4721.3	Siam City Asset Mgmt Co Ltd	Thailand	B - SF
30/06/2011	Citigroup Inc	United States	1913902.0	Horizon Securities Corp	Vietnam	B - SF
12/07/2011	Industrial Bank Co Ltd	China	280691.6	China Industrial Intl Trust	China	B - SF
09/12/2011	Kiatnakin Bank PCL	Thailand	4721.3	Phatra Capital PCL	Thailand	B - SF
03/02/2012	BB&T Corp	United States	174579.0	Crump Life Insurance Services	United States	B - IU
11/04/2012	Banco Espirito Santo SA	Portugal	103987.6	BES Vida Cia de Seguros SA	Portugal	B - IU
09/08/2012	CaixaBank SA	Spain	350470.3	Undisclosed Insurance JV	Spain	B - IU

The Table presents details of the sample of deals. The sample consists of available international data collected for 272 publicly announced deals between 1991 and 2012. Information on deals is obtained by Thomson One Banker. The assets figures are reported in real terms, as per the year-end before the deal announcement(s). The last column reports the type of deal; B – IU are deals where the bidder is a bank and the target an insurance company/underwriter (Bank-Insure). B – IA are deals where the bidder is a bank and the target an insurance agency/broker (Bank-Agency). B – SF are deals where the bidder is a bank and the target a securities/commodities broker (Bank-Securities).