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Cross-border bank M&As and risk: evidence from the bond market

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Abstract

The impact of cross-border bank M&As on bank risk remains an open question. Though geographically diversifying bank M&As have the potential to reduce the risk of bank insolvency, they also have the potential to increase that risk due to the increase in risk-taking incentives for bank managers and stockholders following these transactions. This paper empirically investigates whether cross-border bank M&As increase or decrease the risk of acquiring banks as captured by changes in acquirers' yield spreads. The paper also investigates how differences in the institutional environments between bidder and target countries affect changes in yield spreads following M&A announcements. The study finds that bondholders, in general, perceive cross-border bank M&As as risk-increasing activities, unlike domestic bank mergers. Specifically, on average, yield spreads increase by 4.13 basis points following the announcement of cross-border M&As. This study also finds that these yield spreads are significantly affected by the differences in investor-protection and deposit-insurance environments between the transacting countries. However, the study does not find that the regulatory and supervisory environment in the home countries of the transacting parties significantly affects the changes in yield spreads. The overall evidence suggests that regulators should judge the relative environment in both the home and the host countries in evaluating the associated risks of an active multinational financial institution and in setting the sufficiency of the banks' reserve positions.

Keywords: bank risk, cross-border, M&A, yield spreads

JEL classification numbers: G14, G21, G34, F23

Velkamarkkinoiden käsitykset kansainvälisten pankkifuusioiden vaikutuksista pankkitoiminnan riskeihin

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Tiivistelmä

Kansainvälisten pankkifuusioiden vaikutukset pankkitoiminnan riskeihin ovat edelleen kiistanalaisia. Kansainvälisiä pankkifuusioita voidaan yhtäältä tarkastella maantieteellisen hajauttamisen näkökulmasta, jolloin fuusioiden voidaan katsoa vähentävän pankkien konkurssiriskiä. Toisaalta tällaiset fuusiot voivat kasvattaa pankkien konkurssiriskiä, koska ne saattavat lisätä pankkien johdon ja osakkeen-omistajien kannusteita liialliseen riskinottoon. Tässä tutkimuksessa tarkastellaan empiirisesti kansainvälisten pankkifuusioiden vaikutuksia ostajapankin riskeihin, joita mitataan ostajapankin markkinavelan korkomarginaalilla. Työssä tutkitaan lisäksi, miten ostaja- ja kohdemaan institutionaalisen ympäristön erot vaikuttavat korkomarginaalien muutoksiin sen jälkeen, kun markkinoita on informoitu pankkifuusioista. Tulosten mukaan velkamarkkinat uskovat kansainvälisten pankkifuusioiden yleisesti lisäävän pankkien riskejä. Kotimaisten pankki-fuusioiden vaikutukset koetaan sen sijaan päinvastaisiksi eli pankkien riskejä vähentäviksi. Numeroiksi puettuna korkomarginaali kasvaa tulosten mukaan 4,13 peruspistettä kansainvälisen pankkifuusion julkaisemisen jälkeen. Työssä osoite-taan myös, että erot fuusioon osallistuvien maiden sijoittajansuojassa ja talletus-vakuusjärjestelmässä vaikuttavat tilastollisesti merkitsevästi korkomarginaaleihin. Tilastohavainnot eivät kuitenkaan tue ajatusta, että fuusion osapuolten kotimaiset sääntely- ja valvontajärjestelmät vaikuttaisivat korkomarginaaleihin. Kaiken kaik-kiaan näyttö viittaa siihen, että sääntelyviranomaisten tulisi verrata rahoitus-laitosten toimintaympäristön ominaisuuksia koti- ja sijaintimaassa, kun ne arvioi-vat aktiivisten monikansallisten rahoituslaitosten riskejä ja puntaroivat pankkien reservivaatimusten riittävyyttä.

Avainsanat: pankkiriski, kansainvälinen yrityskauppa, korkomarginaalit

JEL-luokittelu: G14, G21, G34, F23

Contents

1   Introduction

A number of recent studies have addressed the geographical diversification of banks through cross-border mergers and acquisitions (eg, Vander Vennet, 1996, Winton, 1999, Berger, DeYoung, Genay, and Udell, 2000, and Amihud, DeLong, and Saunders, 2002). Although the effects of this type of M&A activity on bank risk is an important issue to all stakeholders including bondholders, bank supervisors, and regulators of acquiring and target countries, few studies investigate the impact of cross-border bank M&As on risk. Thus, their effect on risk remains an open question. This paper examines this issue.

Berger (2000), among others, suggests that geographically diversifying bank mergers reduce the risk of insolvency if they reduce the combined bank's earning and cash flow volatilities. This, he points out, happens because the returns on loans issued in different countries have relatively low covariation. On the other hand, other studies (eg, Keeley, 1990) point out that these mergers also carry risk-increasing effects due to the incentives of bank managers and stockholders to shift risk when the regulatory safety net and its associated implicit and explicit guarantees are underpriced.[1] Winton (1999) points out that geographical diversification also results in risk-increasing monitoring problems. Additionally, factors such as geographical distance as well as differences in currencies, languages, culture, and regulatory and supervisory norms are likely to affect risk adversely, thereby leading to higher cost of funds, higher spreads, and ultimately reduced economic growth.

Despite the efforts of regulators, both the second Banking Coordination directive in Europe and the Core Principles for Effective Banking Supervision of the Basel Committee on Banking Supervision fail to clarify which country's regulations should prevail in the event of a cross-border bank merger.[2] Such uncertainty regarding the ultimate responsibility of supervision in cross-border events increases risk to both the banks and regulators. Therefore, both home and host countries' supervisors must assess accurately the risks associated with these cross-border bank consolidations to preserve the safety and soundness of the banking system. These considerations lead to the principal question addressed in this paper: what is the effect of cross-border M&As on bank risk?

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[1] This is the moral-hazard view of bank regulation. This argument is closely associated with the Too-Big-to-Fail (TBTF) phenomenon that is well documented by O'Hara and Shaw (1990) and Boyd and Gertler (1994).

[2] Both the second Banking Coordination directive of 1989 in Europe and the Core Principles for Effective Banking Supervision of the Basel Committee on Banking Supervision (1997) suggest that regulators in the home country, not the host country, should be responsible for the supervision of the combined bank. However, the host country supervisors are jointly involved with regulatory matters affecting subsidiaries, given that they are registered banks in the host country.

As previously pointed out, cross-border bank M&As have important implications for bank managers, bondholders, stockholders, and also regulators. The study by Amihud, DeLong, and Saunders (2002) is the first and, to our knowledge, to investigate empirically the effect(s) of cross-border bank M&As on bank risk. The focus of their analysis is on the impact of these mergers on banks' shareholders. However, the interests of equity holders are often in conflict with the interests of bondholders and regulators who prefer avoiding undue risk-taking (Flannery, 2001). Although bondholders and regulators do bear risk and take losses when the condition of banks deteriorate, they do not share the potential upside gains of risk-taking activities that only accrue to bank managers and stockholders. Thus, the study by Amihud, DeLong, and Saunders is incomplete.

Recently, Renneboog and Szilagyi (2007) and Ongena and Penas (2009) focused on the wealth effect of mergers – both domestic and cross-border – on bondholders. Although the first paper, using European data, reports an economically significant, positive return for the bond holders of the acquiring firms and a positive but insignificant return for the bondholders of the target companies, the latter paper investigates European M&As for the 1998–2002 period and reports a higher abnormal return (0.5 per cent higher after incorporating various control variables) for the domestic M&As than the cross-border M&As.

This paper investigates the impact of cross-border bank mergers and acquisitions on bond yields and therefore on the riskiness of acquiring banks. The study uses bond yields because they directly measure the perceived risk of the bank's bondholders and therefore provide regulators with important information as to how another important group of stakeholders are affected. Bondholders have an incentive to identify banks' risk exposure, and yield spreads are more sensitive to a bank's financial condition and risk on a contemporaneous basis because bonds have lower priority relative to uninsured deposits in case of a liquidation of the bank (Jagtiani, Kaufman, and Lemieux, 2002). Bliss and Flannery (2001) also point out that the yield spreads are correlated with bank risk measures and may assist the supervisors in measuring banks' risk exposure. Evanoff and Wall (2001) further show that the yield spreads are better risk measures of banks than the existing capital-adequacy ratio-based measures, which are currently used for triggering prompt corrective action (PCA). This is because bondholders are less willing to forbear reacting to perceived problems (Evanoff and Wall, 2002).

Indeed, many empirical studies on bank debentures strongly support the notion that bond yield spreads accurately reflect bank risk.[3,4]

The study also presents cross-sectional analyses on the effect of M&As on acquiring firms' bond yields. While controlling for a number of bank-specific characteristics, market competition, economic environment, legal structure and creditor right, and similarity of language and currency, this study provides evidence regarding the importance of institutional and regulatory factors such as investor protection, deposit insurance, and toughness and transparency of the banking supervisory and regulatory environment on changes in yield spreads of the acquiring banks. To the best of our knowledge, this paper is the first to examine the effects of cross-border bank M&As on bank risks using comprehensive bond market data. An understanding of the effects of cross-border bank M&As on constituent stakeholders is not complete without an understanding of its impact on one of the most important classes of stakeholders – bondholders.

Using the bond yield spreads of acquiring banks involved in 147 cross-border mergers completed during the 1995 to 2002 period, the announcement effects of these cross-border M&As are positive and significant. This result indicates an increase in the perceived riskiness of acquirers following M&As and that bondholders of these banks require higher compensation (yields) for the perceived increase in risk. This finding is different from that reported by Penas and Unal (2004) for domestic (US) bank mergers. They find that these consolidations are risk-reducing transactions. In a cross-sectional analysis, the results show that the investor-protection regulations in the acquirer's home country have a significant impact on the changes in bank yield spreads following M&A announcements.[5] The study also finds that the difference in the level of deposit insurance in the banking industry of the two countries affects the changes in yield spreads.[6] Interestingly, the results show that the relative toughness of bank supervisors does not affect yield-spread changes resulting from the M&A announcement. Finally,

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[3] Flannery and Sorescu (1996) show that debenture yield spreads reflect the specific risks of individual issuing banks. See Flannery (1998, 2001) for a survey studies examining the relation between yield spreads and risk measures.

[4] In a related study, Sironi (2003) tests for market discipline in the European banking industry by tracing the subordinated notes and debenture spreads. The overall results support the hypothesis that subordinated-debt investors are sensitive to bank risk unless the debt is issued by government-owned or guaranteed banking institutions. Sironi also reports that the sensitivity of subordinated spreads rose from the first to the second part of the 1990s, with the perception of 'too-big-to-fail' guarantees by private investors gradually disappearing.

[5] These results are consistent with the extant literature that shows that better protection of outside investors limits entrepreneurs' expropriation and results in less risk to investors (eg, La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1997, 2002, and Acharya and Bharath, 2004).

[6] If an acquiring bank is from a country in which the deposit insurance is lower relative to that in the target's country, the effects on yield spreads are found to be significantly higher. This suggests that bondholders perceive that excessive risk-taking by bank mangers due to the deposit-insurance problem that may lead to bank insolvency. This is consistent with the findings by Demirguc-Kunt and Detragiache (2002).

the study finds some evidence of significant wealth transfer from bondholders to stockholders.

The rest of paper is organized as follows. Section 2 discusses literature on bond returns and yield spreads as well as the literature on bank M&As, especially cross-border activities. Section 3 describes data and methodology, section 4 reports the event-study analysis, and section 5 presents cross-sectional results. Section 6 concludes the study.

2   Testable hypotheses

This section develops several testable hypotheses regarding the effects of cross-border bank M&A on acquiring banks' risk, which the study proxies with bond yield spreads. Additionally, the study evaluates several bank- and country-specific characteristics associated with the abnormal changes in yield spreads.

2.1   Bank risk

Current research suggests that cross-border bank mergers have the potential to reduce the risk of bank insolvency (eg, Vander Vennet, 1996, and Amihud, Delong, and Saunders, 2002). Because corporate earnings are likely to be much less correlated across countries than within a country due to the different business cycles, a bank's earnings can thus be stabilized more effectively by acquiring a foreign rather than a domestic bank, *ceteris paribus*. Lower earnings volatility reduces the overall riskiness of a bank, which is reflected in a lower bond yield spread. On the other hand, when the regulatory safety net and its associated implicit and explicit guarantees are underpriced, and when new and risk-increasing monitoring problems exist, banks tend to shift risk (Repullo, 2001 and Winton, 1999).

In addition, factors such as geographical distance, different language and cultures, and differences in regulatory and supervisory norms may increase risk and thus result in higher cost of funds and higher yield spreads. Winton (1999) suggests that diversification involves moving into sectors or geographic regions that differ from the bank's home base, and loans in these new sectors or regions are likely to perform worse. This kind of diversification not only lessens the bank's monitoring incentives, but also increases the bank's chance of failure.

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2.2   Investor protection

La Porta, Lopez-de-Silanes, Shleifer, and Vishny (hereafter LLSV) (1997) and (1998) show that the extent of legal protection for investors is an important determining factor in a country's financial-market development. In particular, better protection for both stockholders and creditors suggests that outside investors (acquirers) would be willing to pay more for financial assets because they believe that more of the firm's profits would return to them as dividends or interest; insiders are not able to expropriate as much as they would otherwise (LLSV, 2002). LLSV (2002) also find that strong legal protection of investors is associated with higher valuation of corporate assets. They interpret this finding as support for the conjecture that with strong legal protection, expropriation of minority stockholders' wealth is substantially reduced. More investor rights may thus be interpreted as indicative of less risk to investors; thus, all else equal, investment risk decreases. Therefore, if a bank takes over a financial institution in a country with relatively more investor protection, the acquirer's risk should not increase; in fact, the risk may decline.

2.3   Deposit insurance

Deposit insurance, especially explicit deposit insurance (EDI), reduces the losses that depositors incur in the case of bank failure. However, having an explicit deposit-insurance system may lead to greater moral-hazard problem for bank managers, who may take advantage of the deposit-insurance program by engaging in more risk-increasing activities. The banking literature suggests that the more generous deposit insurance is, the greater the risk-taking incentives for banks. Deposit insurance may also make depositors less likely to enforce market discipline on banks and may induce banks to take additional risks. Consistent with this argument, Demirguc-Kunt and Huizinga (2004) and Demirguc-Kunt and Detragiache (2002), among others, show that deposit insurance increases the probability of banking crises. Thus, a more generous deposit-insurance system may lead to greater moral-hazard problems for bank managers. Therefore, *ceteris paribus*, the bigger the moral hazard caused by relative differences in deposit-insurance systems, the greater the likelihood of an increase in the risk of bank failure, thereby leading to higher yield spreads.

2.4　Regulation and supervision

Berger et al (2000), Focarelli and Pozzolo (2001), Buch and Delong (2004), Jayaratne and Strahan (1998), and Saunders (1999), among others, suggest that the regulatory and supervisory environment of a country's bank system significantly influences cross-border bank M&As. Governmental regulation and supervision may reduce information asymmetries and are often essential to ensure the solvency of whole banking systems. This situation enhances bank transparency, thus creating a safer financial system and in turn enabling banks to expand their activities abroad (Berger, DeYoung, Genay, and Udell, 2000). Large differences in regulation and supervision between the countries of acquiring banks and the countries of target banks offer global advantages and thereby increase the chances of better performance. This condition reduces the risk of bank failure, thus leading to lower yield spreads.

However, existing regulations and restrictions in the banking system can also lead to cross-border M&As that increase risk. Regulatory restrictions, for instance, may reduce competition, efficiency, and the international competitiveness of domestic banking system. Thus, banks operating in more tightly regulated markets may have an incentive to expand abroad to bypass restrictions. Therefore, if cross-border bank M&As are used as a mechanism to bypass governmental regulations and supervisions, they increase the chance of bank insolvency due to the diseconomies of operating or monitoring an institution from a distance.[7] Peek, Rosengren, and Kasirye (1999) provide evidence consistent with this argument. These ideas imply that differences in regulation and supervision between the countries of acquiring banks and the countries of target banks may increase the risk of bank failure, resulting in higher yield spreads. In sum, the effects of the regulatory and supervisory environment of a country's banking system are uncertain and are therefore an empirical issue.

2.5　Additional factors

A recovery rate is defined as how many cents on the dollar claimants recover from an insolvent firm.[8] The credit spreads of risky bonds and loans depend inversely on the recovery rates on the bond and loan under consideration (Acharya and Bharath, 2004). A bank with a higher recovery rate can thus be interpreted as having a high probability of recovering its loans, and thus a relatively lower risk.

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[7] This view is the home-field advantage argument of Berger, DeYoung, Genay, and Udell, (2000).
[8] The definition of recovery rate comes from the World Bank; the measure is developed in 'Efficiency in Bankruptcy', an ongoing research by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2004b).

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Therefore, if a bank takes over a financial institution in a country with a high recovery rate, at a minimum its risk should not increase, assuming all other things are equal. On the other hand, if a bank acquires a bank in a country with lower creditor rights, the bank's risk may increase, resulting in an increase in its yield spreads.

The 'power' theories of credit say that when lenders can force repayment of their debts more easily, they are more willing to extend credit to borrowers.[9] Djankov et al (2004a) examine the importance of information and power theories of credit in explaining variations in the size of private credit markets around the world. They find that countries with stronger legal protection for creditors have deeper credit markets, suggesting that the power to seize and liquidate collateral by secured creditors supports a successful debt market. These kinds of substantial creditor rights can in turn be interpreted as less risk of not recouping its loans from borrowers. Therefore, if a bank acquires a financial institution in a country with more creditor rights, assuming all things are equal, the bank's risk is likely to decrease. On the other hand, if a bank expands to a country with fewer creditor rights, the bank's risk may increase because the bank is less likely to earn a return on its loans to borrowers. Therefore, the yield spread should increase.

If the banking industry is concentrated due to entry regulations, a small number of large banks that can enjoy rents or high franchise value tend to operate in a prudent manner (Hellman, Murdock, and Stiglitz, 2001). Large banks also can diversify better; thus, banking systems composed of a few large banks will be less risky than banking systems composed of many small banks (Beck, Demirguc-Kunt, and Levine, 2003). Allen and Gale (2000) argue that a few large banks are easier to monitor than many small banks. This idea suggests that the risk of the banking sector is lower in a concentrated banking system. Even if the banking system is unstable, banking concentration may lead to the too big to fail (TBTF) policy. In any case, bank risk is lower in an increasingly concentrated banking system.

On the other hand, a highly concentrated banking sector may also increase the risk of banks. Mishkin (1999) suggests that banks that are very large receive greater subsidies through TBTF policies, and the greater subsidies may provide an incentive for bank managers to take on more than the optimal level of risk. This effect in turn may eventually result in bank insolvency. In addition, banks in countries with highly concentrated banking sectors and with greater market power tend to charge higher interest rates to firms, which may in turn induce firms to pursue riskier projects that may result in insolvency. Finally, if bank size is positively correlated with complexity, large banks are much more difficult to properly monitor than many small, less complex banks (Beck, Demirguc-Kunt,

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[9] The power theory of credit is formalized by Townsend (1979) and Aghion and Bolton (1992).

and Levine, 2003). Therefore, the impact of relative banking concentration on changes in the bank yield spreads of acquiring banks is difficult to predict.

Berger, DeYoung, Udell (2001) suggest that barriers such as differences in language, law, culture, and currency, as well as geographical distance significantly influence cross-border bank consolidation. Buch and DeLong (2004) also argue that 'information costs' affect cross-border bank mergers significantly. Thus, the sharing of a common language between acquirers and targets, the presence of common legal origins, and a common continental region could have a positive impact on cross-border M&As. The reduced information costs may create synergy gains and enhance the probability of merger success and better performance. Better performance due to lower information costs reduces the chance of bank failure and thus results in a lower yield spread, *ceteris paribus*.

3   Data, methodology, and variables

3.1   Data

We examine cross-border bank mergers that were announced and completed between 1995 and 2002, where at least one of the partners is a commercial bank and the other partner is any financial institution. A cross-border merger is any merger whereby the headquarters of the target are not located in the same country as the ultimate parent of the acquirer (Buch and DeLong, 2004). Data on cross-border bank mergers and acquisitions is from the Thomson Financial Securities Data Corporation Platinum database (SDC). The initial screening results in 890 cross-border mergers that met the criteria. Mergers where the acquirer's stock is not publicly traded or where bond returns and yields are not available through Datastream are dropped. M&As in which the acquirer is from a country for which Datastream does not provide information on its government bonds are also excluded. If an acquirer announces the purchase of another bank within six months after the first announcement, the second announcement is dropped from the sample. Finally, an acquiring bank needs to have at least one bond outstanding with a remaining maturity greater than 2 years. Extremely small issues and junk bonds, as well as callable, putable, convertible, and subordinated issues are avoided. For European bonds, domestic bonds rather than Eurobonds are considered. Robustness tests use the Lehman Brothers Bond Database and Reuters Fixed Income Database for bond pricing data, as well as the Merrill Lynch bank index and EMU Corporate Index. The final sample reported in this paper consists of 147 cross-border bank mergers.

We obtain bank- and country-specific data from several sources. Bank financial data are from the Fitch-IBCA Bankscope database, and individual bond

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data and the government bond data for the countries of acquiring banks are from Datastream. Data for several country-specific regulatory and supervisory variables come from Barth et al (2001) and the World Bank database (2004). Data for institutional variables such as creditor rights, recovery rates, income level, and the level of contract enforceability are obtained from the World Bank and several of their working papers.

3.2   Methodology

We define the yield spread as the difference between the yield on a particular bank bond and a government security of comparable maturity from the bank's home country. This spread reflects the market's assessment of the bank bond's risk (Gande, Puri, and Saunders, 1999). The measure of bond yield spreads is based on the weekly yield data from Datastream. All of a firm's bond yields merge into a single yield by computing the market-value-weighted averages of individual bond yields. The methodology to measure the abnormal announcement effect of cross-border bank M&As on bond yield spreads is adopted and modified from Eckbo, Maksimovic, and Williams (1990). The study uses weekly yield data (to control for thin trading that is usually a characteristic of bond markets). Abnormal changes in yield spreads due to the M&A announcements are estimated directly as the parameter β_j in the following model

$$SP_{jt} = \alpha_j + \beta_j d_{jt} + e_{jt} \qquad\qquad (3.1)$$

where SP_{jt} is the market-value-weighted average yield spread of bank j's bond over the government security of comparable maturity, d_{jt} is a dummy variable that equals 1 if week t is the week of the announcement of the acquisition and 0 otherwise, and e_{jt} is the error term. The estimates, which are obtained by OLS, are mainly based on an estimation window of the previous 30 weeks plus the event windows and are adjusted for heteroskedasticity and serial correlation. The abnormal effects are averaged with equal weights across banks. The test statistics for the abnormal effect on yield spreads are based on the Z-test.[10]

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[10] See appendix for further details on alternative methods used in capturing risk; the Z-test; and additional specifics on measuring bond-yields.

3.3   Variables

The variables used to examine the effect of cross-border M&As on bank yield spreads include bond-specific information, bank-specific variables, and country-specific information such as regulatory and supervisory information, creditor rights, and recovery rate. This section describes these variables, how they are measured, and why they are in the analysis.

As pointed out earlier, the measure of announcement-week effects on bank yield spreads is estimated directly as the parameter β_j in equation (3.1). The cross-section regression models use the natural logarithm of 1 plus the parameter β_j to correct for the high kurtosis that characterizes the β_j parameter. To capture the moral-hazard problems due to the deposit-insurance guarantees of each country, the index of deposit insurance developed by Demirguc-Kunt and Detragiache (2002) is included, which is obtained from the World Bank database (2004).[11] The higher the value of this variable, the greater is the country's moral-hazard problem.

Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2004b) construct the strength-of-investor-protection index, measured as the average extent of a disclosure index, a director liability index, and an ease-of-shareholder-lawsuits index. The data for investor legal protection are taken from Djankov La Porta, Lopez-de-Silanes, and Shleifer (2004b), which is also available in the World Bank's database.[12] The higher the index value, the better the investor protection.

LLSV (1998) argue that a country's legal origin is an important factor in determining firm value, and Buch and DeLong (2004) suggest that the presence of a common legal system has a positive impact on cross-border M&As. Following Djankov La Porta, Lopez-de-Silanes, and Shleifer (2004b), five main legal origins exist: English, French, German, Nordic, and Socialist. The study includes a dummy variable equal to 1 if both the acquirer and the target have the same legal origin, 0 otherwise. Buch and DeLong suggest that sharing a common language lowers the costs of combining two corporate cultures, and thus a common language can be a proxy for common cultural links. Similar to these authors, this study includes a dummy variable if the target and the acquirer have the same language.

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[11] The index is constructed from the following variables: (i) if membership is mandatory, (ii) nominal coverage limits are not specified, (iii) coinsurance does not exist for depositors, (iv) deposit-insurance obligations are funded in some way, (v) funding comes partially or totally from government, (vi) the system is partially or totally managed by the government, (vii) foreign-denominated deposits are explicitly covered, and (viii) interbank deposits are formally guaranteed.
[12] The index captures seven ways of enhancing investor protection: (i) information on family, (ii) indirect ownership, (iii) beneficial ownership, (iv) voting agreements among shareholders, (v) audit committees that review and certify financial data, (vi) a legal requirement to appoint external auditors, and (vii) public availability of ownership and financial information.

As discussed, the regulatory and supervisory environment of a country's banking system can significantly influence the impact of cross-border bank M&As on bank risks. Following Buch and Delong (2004), two measures of bank regulation and supervision – toughness and transparency – constructed from the World Bank database (2004) are used. The toughness measure is the sum of dummy variables assumed to capture the toughness of the supervisory environment.[13] The transparency index is the sum of dummy variables capturing several aspects of bank disclosures.[14]

We also include a measure of banking concentration in each country, which is obtained from the World Bank database (2004). The measure counts the fraction of assets in the five largest banks that is owned by commercial banks and/or financial conglomerates. The impact of the concentration of the banking industry on acquirers' yield spreads is uncertain. On one hand, concentration may lead to the TBTF phenomenon, thereby alleviating depositors' concerns about bank failure and resulting in less required compensation for default risk. On the other hand, bank concentration may encourage banks to engage in more risky activities by exploiting the implicit guarantee from the government, thereby resulting in higher yield spreads.

We use the creditor-rights index developed in La Porta, Lopez-de-Silanes, and Shleifer (1999) and extended by Djankov, Glaeser, La Porta, Lopez-de-Silanes, and Shleifer (2004) to measure the creditor protection within a given country. This index measures the four common legal and regulatory rights of secured lenders.[15] A higher value indicates stronger creditor rights or stronger protection against borrower expropriation. Therefore, in countries with higher index values, banks' loan contracts are assumed to be less risky, *ceteris paribus*. The recovery rate developed by Djankov, Glaeser, La Porta, Lopez-de-Silanes, and Shleifer (2004), and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2004a) is included. This variable calculates how many cents on the dollar claimants recover from an insolvent firm; data is obtained from the World Bank database (2004).

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[13] The supervisors' aspects are based on answers to the following questions: (i) Are supervisors legally liable for their actions? (ii) Can the supervisory agency supersede shareholder rights and declare a bank insolvent? (iii) Can the supervisory agency order directors/management to constitute provisions to cover actual/potential losses? (iv) Can the supervisory agency suspend dividends? (v) Can supervisory agency suspend bonuses? (vi) Can supervisory agency suspend management fees?

[14] The transparency index captures the following aspects: (i) Are consolidated accounts covering banks and any nonbank financial subsidiaries required? (ii) Do regulations require credit ratings for commercial banks? (iii) Must banks disclose risk-management procedures to the public? (iv) Are off-balance-sheet items disclosed to the public?

[15] The index is calculated by examining following aspects: (i) restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization; (ii) the ability for secured creditors to seize collateral after the reorganization petition is approved; (iii) whether secured creditors are paid first out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors, such as governments or workers; and (iv) whether management retains administration of its property pending the resolution of the reorganization.

Finally, bank-specific variables that have been shown to be important in explaining bank risk are included. These are the natural logarithm of the book value of total bank assets, the percentage of common equity to total bank assets, and the percentage of loan loss reserves to total loans.

Table 1, Panel A shows the national identities of acquirers and targets in cross-border bank M&As. Banks in countries such as France, Germany, the Netherlands, and the United Kingdom are the most active both as acquirers and targets. Most of the acquirers are from developed countries with high income levels. On the other hand, target-bank countries are usually small and less developed. The distribution of the national identities is somewhat different from that of Amihud, DeLong, and Saunders (2002), with the difference probably due to the fact that, unlike them, this study's data set contains only cross-border bank M&As in which bond information exists for the acquirers. This constraint results in a different distribution of acquirers and targets than those in the Amihud et al sample.

Table 1, Panel B shows the distribution of mergers contained in the sample by announcement year. The group includes 14 mergers in 1995; this number increases to 22 in 1998 and 22 in 1999, then declines to 15 by 2002. Panel C of Table 1 shows descriptive statistics of variables used in this paper. The average yield spread is about 80 basis points, with a maximum of 288 bps and a minimum of 1.45 bps. On average, bonds have a remaining maturity of 5.24 years and an average market value of $461 million.

4   Empirical results

4.1   Cross-border bank M&As and yield spreads

This section examines the effects of cross-border bank M&A announcements on yield spreads, which are a proxy for the riskiness of acquiring banks. As discussed, cross-border bank mergers may have two potential effects on bank risk: they may reduce the risk of insolvency (Vander Vennet, 1996, Berger, DeYoung, Genay, and Udell, 2000, and Amihud, Delong, and Saunders, 2002), or they may increase the risk based on managerial risk-shifting incentives (Repullo, 2001 and Winton, 1999). In addition, factors such as differences in the levels of deposit insurance, investor protection, recovery rate, creditor rights, geographical distance, language and cultures, and regulatory and supervisory norms may affect the risk. The methodology explained in Section 3 is used to measure the abnormal effect of announcements on yield spreads.

Table 2 presents the average abnormal effect of announcements on yield spreads for the full sample. Two different estimation windows – SP30 and SP52 –

estimate the model parameters. In the SP30 estimation, the average abnormal effect is calculated by using yield spreads for 30 weeks before the announcement day plus event weeks. In the SP52 estimation, the average abnormal effect is based on the estimation window of 52 weeks before the announcement day plus event weeks. The announcement windows varied extensively and the results were robust to these different specifications.[16] Panel A contains the results for the full sample; the table shows that the abnormal effects are all positive and statistically and economically significant irrespective of the announcement windows. The risk-increasing effect is observed in all short-term windows (SP30) as well as the long-term windows (SP52). These results indicate that, on average, the bond market reacts negatively to cross-border bank M&As, consistent with the argument that bondholders perceive these mergers as risk-increasing activities.

Panel B of Table 2 contains the results associated with separating the abnormal effect on yield spreads into two groups based on the sign (negative and positive) of the abnormal effects. The results show that the abnormal effects for both groups are highly statistically significant. These results are consistent across parameter-estimation windows as well as announcement windows. Interestingly, in all cases the positive abnormal effects are significantly higher than the corresponding negative effects.[17] These results suggest an asymmetric effect of cross-border bank M&As on the acquirers' yield spreads.

Panel C divides the sample into quartiles based on the relative size of targets and acquirers. The relative size is measured as a ratio of the target's total assets to the acquirer's. This ratio is then used to form quartiles, with the first (fourth) quartile containing the mergers in which the target bank is relatively small (large) compared to that of the acquirer. Panel C shows that the abnormal effects for the first-quartile deals are mixed and are not statistically significant except for the (-1W,+52W) announcement windows, thus indicating that the bond market does not react to smaller deals. However, as the size of target bank increases relative to the acquirer, the abnormal effects are all positive and statistically and economically significant in all announcement windows. In addition, the magnitude of the abnormal effects on yield spreads also monotonically increases as the relative size increases. The results for the fourth-quartile deals are especially striking in that the increase in the yield spread is at least four times greater than any of the other quartiles in the short-term windows. These results are consistent with expectation that bond markets are efficient and correctly recognize the important size effects on acquirers' yield spreads in cross-border M&A.

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[16] Additionally, delta spreads are used instead of reported simple spreads, defined as the first difference in yield spreads as a robustness check. In summary, the results are similar to the ones reported in the text and therefore not reported in the text. These results are available upon request.
[17] The differences between the two groups and their statistical significance are not reported here in order to maintain the clarity of the tables. However, they are available upon request.

Overall, the results suggest that bondholders of acquiring banks require higher yields as compensation for the perceived increase in bank risk due to cross-border bank M&As. These results are different from those reported in studies based on domestic M&As. For instance, Penas and Unal (2004) find that the average bond returns to acquirers are positive, suggesting that bond markets perceive bank mergers across states in the US as default-risk reducing transactions. In contrast, this study's results suggest that, in general, cross-border bank M&As are perceived as risk-increasing activities to bondholders.[18]

4.2   Equity returns and yield spreads: do wealth transfers occur?

So far, on average cross-border M&As have a statistically and economically positive and significant effect on acquirers' yield spreads, indicating that on average bondholders perceive these M&As as risk-increasing transactions. This portion of the study investigates whether a change in acquirers' stock returns also exists and if this change is a wealth transfer from (to) bondholders.

To examine the wealth effect on stockholders, the event study methodology assumes, similar to Amihud, DeLong, and Saunders (2002), that security returns are driven by the following three-factor market model

$$R_{jt} = \alpha + \beta_{world,j} R_{world,t} + \beta_{home,j} R_{home,t} + \beta_{host,j} R_{host,t} + \varepsilon_{jt} \tag{4.1}$$

where R_{jt} is the return on acquirer j on day t, $R_{world,t}$ is the world bank index return on day t, $R_{home,t}$ is the home bank index on day t, $R_{host,t}$ is the host bank return index on day t, and ε is the error term. The estimation window is $t = (-260, -11)$ days before the announcement. The abnormal return for stock j on day t is calculated using the parameters in equation (4.1). Finally, the cumulative

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[18] Additional analysis examine the effect of cross-border bank M&As on yield spreads by forming groups based on the differences in acquirer- and target-country characteristics (eg, differences in economic development, investor legal protection, deposit insurance, toughness and transparency of the banking environment, origin of law, income level, and language). The study also tests for wealth-transfer effects between bondholders and stockholders. The results show that such differences do matter (eg, cross-border M&As in which the acquirer from a developed country takes over a bank in a developing country are perceived as risk-increasing transactions, though no significant reaction exists if the target is in a developed market). Consistent results occur where outside investors (both bondholders and stockholders) are less concerned about expropriation risk and therefore require less compensation for risk. Similar results are also found for the differences in deposit-insurance systems, the regulatory and supervisory environment of the banking sectors, or differences in disclosure requirements between the two groups. In all cases bondholders believe such information costs affect bank risk. These details are not reported, though some of these findings are in the tables with multiple regressions (eg Table 8). Additionally, the study forms groups based on recovery rate, creditor rights, and banking concentration. These results are available upon request from the authors.

abnormal return (CAR$_j$) is calculated for various windows where t=0 is the announcement day. The cumulative average abnormal return (CAAR$_j$) is calculated by averaging the CARs across the banks.

Table 3 presents the abnormal returns to bidders around the announcement of cross-border M&A (t=0). Panel A shows that the average CAR is positive and significant in (-5, 0), (0, 0), and (-1, +1) announcement windows. The CAAR for (-5, 0) is 0.57%. This number indicates leakage of information well before the actual announcement, a finding that is not unusual in the cross-border M&As literature. The positive average abnormal return is different than that reported by Amihud, Delong, and Saunders (2002), who find that an acquirer's average CAR is negative.[19] The difference in results appears due primarily to the fact that this sample is different from theirs. Additionally over 50 of the target banks are nonpublic or private institutions, a circumstance known to have positive acquisition announcement effects (Fuller, Netter, and Stegemoller, 2002, Moeller, Schlingemann, and Stulz, 1991). The average result of a positive return is dominated by these mergers with nonpublic targets.

As noted, the study uses only cross-border bank M&As in which bond data exists for the acquirers, a requirement that resulted in the study's acquirers being relatively large banks. In contrast, because they did not have the bond data requirement, Amihud, Delong, and Saunders used a much more heterogeneous sample. Note that their results were not strongly significant.

Panel B shows that, depending on the event window, the average value for the positive CARs ranges from 1.70 per cent to 4.40 per cent. On the other hand, the average for the negative CARs ranges from -1.09 per cent to -4.47 per cent. The results are dramatically different from those reported in Panel A, in that in all cases the abnormal returns to bidders are highly statistically significant. A possible explanation for this difference in significance levels is that in Panel A, the positive CARs are offset by the negative CARs, hence the economic and statistical significances are reduced dramatically. Panel C separates the sample based on positive and negative AESP. Column 2 reports results for the positive AESP grouping where the t = (-5,0), (-1,1), and (-5,5) windows report a positive and significant CAAR. Because the abnormal effect on yield spreads is positive and the CAAR to stockholders is positive, the results for this group suggest a wealth transfer from bondholders to stockholders occurs. For the negative AESP group, the results are insignificant and suggest that wealth is not redistributed between these two claimholders. Taken together the findings are still consistent with the presence of wealth transfer.

The following regression equation formally tests the relationship between bondholder and stockholders gains

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[19] When using the (-10,1) event window of Amihud, DeLong, and Saunders (2002), the CAAR is 0.2069% with t-statistic of 0.58.

$$AESP_i = \alpha + \beta * CAR_i + \varepsilon_i \qquad\qquad (4.2)$$

where $AESP_i$ is the abnormal effect on bond yield spreads of acquirer i and CAR_i is the cumulative abnormal return on acquirer i.[20] In general, the increase in bank risk may induce a wealth transfer from bondholders (stockholders) to stockholders (bondholders).[21] If in fact wealth transfer occurs, a significant coefficient is expected for the variable CAR_i in equation (4.2).

Table 4 presents the results of this formal test of wealth transfer for the full sample. The table contains the coefficients of CARs results for the full sample based on various announcement windows. The announcement window (-5,0) and (-5,5) offers evidence of wealth transfers between these two claimholders. The coefficients of CAR are 1.5399 and 1.1613 and they are statistically significant at least at the 5 per cent level. The results suggest a wealth transfer from bondholders to stockholders consistent with the increase in yield spreads reported in Table 3. However, the study finds no evidence of wealth transfer in other windows, which is not surprising given the absence of significant abnormal stock returns.[22]

5   Multivariate analysis

The univariate tests of the previous section suggest that variables such as investor protection, deposit insurance, recovery rate, creditor rights, and information costs significantly affect yield spreads of acquiring banks. This section presents cross-sectional multivariate regression results. Results are based on estimates from the following regression equation

$$AESP_i = \alpha + \beta_1 Investor_i + \beta_2 Deposit\ Insurance_i + \beta_3 Tough_i + \beta_4 Trans_i$$
$$+ \Sigma\beta_j Z_i + \varepsilon_{jt} \qquad\qquad (5.1)$$

where AESP is the measure of abnormal effects on yield spreads and is estimated directly as the parameter β_j from equation (3.1). The study uses the natural

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[20] CARs are calculated based on Eckbo et al (1990), equation (4.2) tests the wealth transfer from shareholders to bondholders. The results are qualitatively similar and are available upon request. Therefore, CARs obtained from the conventional event study methodology are used.

[21] Additionally, the regression $CAR_i = \alpha + \beta * AESP_i + \varepsilon_i$ tests the wealth transfer from shareholders to bondholders. The results are very similar to the ones reported in Table 5 and are therefore not reported. These results are available upon request from the authors.

[22] The reported results on wealth transfer were checked using the converted bond return (as discussed in footnote 11) instead of AESP on the CAR_i, observing similar results as reported in the text.

logarithm of 1 plus the parameter β_j because the parameter has a high degree of kurtosis. AESP is estimated based on several announcement windows as well as different estimation windows (either SP30 or SP50).

Investor is a dummy variable measuring investor legal protection and is equal to 1 if a target's country has better investor protection than an acquirer's country; otherwise the variable is 0. Deposit Insurance captures the relative moral-hazard problem and is measured as the natural logarithm of the ratio of the target country's deposit-insurance index over the acquirer's deposit-insurance index. Tough is a relative toughness index of bank supervision between target and acquirer countries. The study uses the ratio of the target country's index over the acquirer's country index. Trans is a transparency measure reflecting the ratio of a target's country index to an acquirer's country index.

The variable Z is a vector of control variables. Recovery is a dummy variable that takes a value of 1 if a target's country has a better recovery rate than an acquirer's country; otherwise, the variable takes a value of 0. The study also includes a measure of relative banking concentration of the target's country to the acquirer's country. Concent is a dummy variable that is equal to 1 if a target country has a higher banking concentration than an acquirer country; otherwise the variable is 0. Creditor rights (Creditor), measured as the ratio of a target country's creditor rights to an acquirer's index, are included. A higher value of Creditor indicates stronger creditor rights in a target's country compared to an acquirer's country. A dummy variable, Law, is included; it is equal to 1 if the acquirer and target countries have the same legal origin; the variable is 0 otherwise. The study also includes a dummy variable that takes a value of 1 if both countries have similar income levels; otherwise the variable is 0. The study controls for foreign-exchange risk with DFX, a dummy variable that takes a value of 1 if both a target and an acquirer use the same currency; otherwise the variable is 0.

The M&A literature shows that the method of payment plays a significant role in the premium paid to targets and the acquirers' wealth effects. Consequently, D100CS, the proportion of payments in cash, is included. Finally, the study controls for bank characteristics using the following variables: LogTAacq, ROEacq, TETAacq, and LLRacq. LogTAacq is the natural logarithm of the prior-year total assets of acquiring banks before the M&A. ROEacq is the prior-year return on equity of acquiring banks before the M&A event. TETAacq is the prior-year ratio of total equity to total assets for acquiring banks before the M&A. LLRacq is the prior-year ratio of loan loss reserves to total loans for acquiring banks before the M&A. Although not reported, the study investigates the correlation matrix of the variables used in this paper. Some significant correlation among the explanatory variables exists; however, none are severe enough to create any multicollinearity problem.

Table 6 shows the regression results using SP30 as the estimation windows. The dependent variable is the abnormal effect on yield spreads with the announcement window (-1,0). All regressions use White's (1980) estimator for the covariance matrix. As expected, the difference in investor protection between a target's country and an acquirer's country has a significantly negative impact on AESP. This result is consistent with that found in the univariate analysis and indicates that the bond market perceives cross-border M&As with this type of characteristic as risk-reducing transactions. Throughout the various specifications, investor protection has a significantly negative impact on abnormal changes in yield spreads.

The difference in the level of deposit insurance between the banking industries of the two countries also significantly affects the abnormal effects of the yield spreads significantly. Table 6 shows that if the deposit insurance in the target country's banking industry is higher than that of the acquirer's country, then a positive relationship between deposit insurance and AESP exists. This finding provides support for the notion that the greater the level of deposit insurance the greater the incentive for bank managers to take on more risky projects thereby taking advantage of the deposit-insurance program.[23] The regression results show that bondholders require additional compensation for risk-taking activities in a target country by acquiring bank managers. The significant positive impact of deposit insurance appears in every model specification.

Even though the extant literature contends that the regulatory and supervisory environment of a country's banking industry should have a significant impact on bank risk following a merger or acquisition, this study finds no support for this argument. Furthermore, the results for creditor rights are similar to those obtained for the regulatory and supervisory environment. In particular, statistical significance exists only in models 7 and 10. Surprisingly, the effect is positive – a result different from expectations and significantly different than the results in the univariate analysis (not reported). This positive effect is puzzling, as theory suggests that the impact should be negative.

The results for the recovery rate are dissimilar to those found in the univariate results. Specifically, the coefficient of recovery rate is not statistically significant and that this result holds across the various model specifications. Hellman, Murdock, and Stiglitz (2001) suggest that as a banking industry becomes more concentrated, bank risk decreases due to the profit buffer. However, Mishkin (1999) suggests that high concentration in the banking sector may increase the risk of banks. He argues that with a high degree of concentration, the few large banks present will receive greater subsidies, thereby possibly intensifying their risk-taking activities and thus leading to higher insolvency risk. This study finds,

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[23] Demirguc-Kunt and Detragiache (2002) suggest that this excessive risk-taking by bank mangers may result in greater bank insolvency and produce a higher rate of banking crises in countries that have a relatively high level of moral hazard in their banking industry.

however, a positive but not significant impact of relative banking concentration on changes in yield spreads, thus indicating that bondholders do not perceive banking concentration as a risk factor.

Berger, DeYoung, and Udell (2001) and Buch and DeLong (2004) argue that information costs such as different origins of law significantly affect the wealth effects of cross-border bank M&As. Table 6 however, shows that the origin of law does not affect changes in yield spreads in any meaningful way, implying that that acquirers and targets sharing the same origin of law do not affect bondholders' risk perception in cross-border bank M&As. The difference in income between the transacting countries is also not found to be an important determinant of the announcement effect. Again, this effect is not consistent with the univariate findings where income difference mattered. The regression models also control for foreign-exchange risk, DFX, and find a significant impact of the difference in currencies between the two parties.

Consistent with the existing literature, the method of payment in M&A transactions matters; this study finds a strong positive relationship between cash payments and changes in yield spreads. Cash payment is an outflow of funds available to the acquiring banks. Thus, the use of cash as a medium of exchange is likely to reduce the liquidity of the company, which in turn increases its risk, and that is reflected in the higher yield spreads. Interestingly, bank-specific variables did not appear important in explaining the changes in bond yield spreads associated with cross-border M&As. An exception, however, is the acquirer's loan loss reserves. When an acquirer's bank has a higher level of bad loans before the cross-border M&A, bondholders require significantly higher yield spreads if the bank announces expansion of operations abroad.

To check the robustness of the findings, the study runs the same regressions with different announcement windows as well as with different estimation windows (eg, an announcement window that is one week prior to one week after the announcement day using a 30-weeks-before-the-announcement window). The results are qualitatively similar to results from Table 6 However, the two-week window provides more significant results, especially for DFX, where in all model specifications the result is now statistically significant. In addition, only weak support exists (model 10) for the argument that the regulatory and supervisory environment of a country's banking industry has a significant impact on the risk level of banks following a merger or acquisition. Finally, consistent with Mishkin (1999), relative banking concentration has a positive and significant impact on changes in yield spreads, thus indicating that bondholders do perceive banking concentration as a risk-enhancing factor.

Overall, the multivariate tests suggest that in cross-border bank M&As the differences in investor protection as well as deposit insurance between the target's country and the acquirer's country significantly affect the bondholders' perceived risk as measured by bond yield spreads. Also, the more concentrated the banking

industry is in the target's country, the greater the increase in the announcement-period yield-spread effect. Further, if acquirers pay for targets in cash, the announcement-period effect is larger. However, the study does not find strong support for the argument that the regulatory and supervisory environments of the banking industry significantly affect the announcement-period effects. In addition, the origin of law and differences in income levels do not affect yield spreads. The two-week announcement window models suggest that some bond trading may occur in anticipation of the announcement of the merger or acquisition.[24]

6   Conclusion

In recent years, geographical diversification by banks via cross-border M&As (eg, Focarelli and Pozzolo, 2001) has increased significantly. One school of thought says that cross-border M&As have the potential to reduce banks' insolvency risk. Another says cross-border M&As may in fact increase risk because they encourage managers to shift risk, given the increased costs of monitoring associated with cross-border M&As. To date, empirical evidence either way is extremely limited. This lack of data is surprising given the growing importance of these mergers in the banking industry. What is more, none of the few studies that do exist have examined how cross-border bank mergers affect bondholders, one of the most important bank stakeholders. This paper takes steps to fill this gap by examining the effect of cross-border bank M&As on the yield spreads (riskiness) of acquiring banks. The analysis also presents evidence on the relative importance of country-specific factors such as the level of investor protection, recovery rate, deposit insurance, banking supervision and regulation, creditor rights, banking-concentration law, income levels, and currency, as well as deal- and bank-specific characteristics on the abnormal changes in yield spreads due to M&As announcements.

Using weekly changes in yield spreads, the study finds a significant, positive, abnormal effect on acquirers' yield spreads following the announcement of cross-border bank M&As, indicating that bondholders of acquiring banks require higher yields as compensation for perceived increases in bank risk due to cross-border deals. This supports the strand of literature that contends that cross-border bank

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[24] Once again, the converted bond return (as discussed in footnote 11) is used as a substitute for the yield data in our regressions on several windows: (-1W,0), (0,+1W), and (-1W,+1W). In all these estimations, results are consistent with the reported role of investor protection. Deposit-insurance environment in countries associated with the banks involved in cross-border M&As are still important, affecting bond returns during merger announcements. Similarly, differences in transparency and creditor rights between the target and acquiring countries affected bond returns (but not recovery rate). However, unlike the reported results, the regulatory environment also appears important in explaining bond returns during M&As announcements.

M&As are risk-increasing activities. Additionally, unlike the evidence for domestic mergers (Penas and Unal, 2004), increases in yield spreads can be attributed, to some extent, to wealth transfer from bondholders to stockholders. These results are robust even when bond pricing data is considered instead of yield spreads.

Several other interesting results occur. For instance, differences in investor protection and deposit-insurance environments between the countries associated with the banks involved in cross-border M&As are important in explaining the changes in yield spreads following M&A announcements. Similarly, changes in acquirers' yield spreads are also affected by differences in transparency, recovery rate, and creditor rights between the target and acquiring countries. Importantly, the study does not find the supervisory and regulatory environments are important variables in explaining changes in acquirers' yield spreads following M&As announcements.

Our findings of the importance of deposit insurance and investor protection have several important implications. For example, when a bank acquires or merges with a financial institution in a country characterized by a larger deposit-insurance program, the acquirer should plan to monitor the target's operations more closely, perhaps in coordination with the management in the host country. The regulators may require the acquiring bank to increase its reserves. More important, because each country is responsible for banking supervision, regulation, and the provision of deposit-insurance guarantees, the harmonization on these issues may greatly reduce the adverse impact of cross-border bank operations. Similarly, when the acquiring bank extends its operations to a country with less investor protection, the home country regulator may require the acquirer to increase its reserves to better protect depositors, bondholders, and stockholders. Generally, these points suggest that regulators should consider relative situations in both the home and the host countries when judging the risk of a multinational financial institution and when determining the sufficiency of the banks' reserve positions.

References

Acharya, V V – Sreedhar, B – Srinivasan, A (2004) **Understanding the recovery rates on defaulted securities.** Working paper. London Business School.

Allen, L – Cebenoyan, A S (1991) **Bank acquisitions and ownership structure: theory and evidence.** Journal of Banking & Finance 15, 425–448.

Allen, F – Gale, D (2000) **Comparing financial systems.** Cambridge and London: MIT Press.

Amihud, Y – Lev, B (1981) **Risk reduction as a managerial motive for conglomerate mergers.** Bell Journal of Economics 12, 605–617.

Amihud, Y – Delong, G – Saunders, A (2002) **The effects of cross-border bank mergers on bank risk and value.** Journal of International Money & Finance 21, 857–877.

Barth, J R – Caprio Jr G – Levine, R (2001) **The regulation and supervision of bank around world: A new database.** In: Litan, R E and Herring, R (Eds), Integrating emerging market countries into the global financial system. Brooking Institution Press, Washington, D.C.

Beck, T – Demirguc-Kunt, A – Levine, R (2003) **Bank concentration and crises.** Working paper, the World Bank.

Berger, A (2000) **The big picture of bank diversification.** Proceedings, Federal Reserve Bank of Chicago, 162–174.

Berger, A – Buch, C M – DeLong, G – DeYoung, R (2004) **Exporting financial institutions management via foreign direct investment mergers and acquisitions.** Journal of International Money and Finance 23, 336–366.

Berger, A – Demsetz, R S – Strahan, P (1999) **The consolidation of the financial services industry: causes, consequences, and implications for the future.** Journal of Banking & Finance 23, 135–194.

Berger, A – DeYoung, R – Genay, H – Udell, G F (2000) **The globalization of financial institutions: evidence from a cross-border banking performance.** Brookings-Wharton Paper on Financial Service 2000, 23–120.

Berger, A – DeYoung, R – Udell, G F (2001) **Efficiency barriers to the consolidation of the European financial services industry.** European Financial Management 7, 117–130.

Berger, A – Humphrey (1992) **Mega-mergers in banking and the use of cost efficiency as an antitrust defense.** Antitrust Bulletin 37, 541–600.

Bhattacharya, S – Boot, A – Thakor, A V (1998) **The Economics of Bank Regulation.** Journal of Money, Credit & Banking 30, 745–770.

Billet, M T – King, T H – Mauer, D C (2004) **Bondholder wealth effects in mergers and acquisitions: new evidence from the 1980s and 1990s.** Journal of Finance 59, 107–135.

Bliss, R (2001) **Market discipline and subordinated debt: A review of some salient issues.** Federal Reserve Bank of Chicago, Economic Review (First Quarter 2001), 24–45.

Bliss, R – Flannery, M (2001) **Market discipline in the governance of US bank holding companies: Monitoring vs. influencing.** In: Mishkin, F S (Ed.), Prudential Supervision: What works and what doesn't? University of Chicago Press, Chicago, IL, 107–143.

Boyd. J H – Gertler, M (1994) **The role of large banks in the recent US banking crisis.** Federal Reserve Bank of Minneapolis Quarterly Review, Winter, 319–368.

Buch, C – DeLong, G (2004) **Cross-border bank mergers: What lures the rare animal?** Journal of Banking & Finance 28, 2077–2102.

Cambell, J Y – Lo, A W – MacKinlay, A C (2007) **The Econometrics of Financial Markets.** Princeton University Press.

Caves, R (1971) **International corporation: the industrial economies of foreign investment.** Economica 38, 1–27.

Craine, R – Martin, V L (2008) **International Monetary Policy Surprise Spillovers.** Journal of International Economics, forthcoming.

Cummins, J D – Tennyson, S L – Weiss, M A (1999) **Consolidation and efficiency in the U.S. life insurance industry.** Journal of Banking & Finance 23, 325–357.

Danbolt, J (1995) **An analysis of gains and losses to the shareholders of foreign bidding companies engaged in cross-border acquisitions into the United Kingdom, 1986–1991.** European Journal of Finance 1, 279–309.

DeLong, G (2001) **Stockholder gains from focusing versus diversifying bank mergers.** Journal of Financial Economics 59, 221–252.

Demirguc-Kunt, A – Detragiache, E (2002) **Does deposit insurance increase banking system stability? An empirical investigation.** Journal of Monetary Economics 49, 1373–1406.

Demirguc-Kunt, A – Huizinga, H (2004) **Market discipline and deposit insurance.** Journal of Monetary Economics 51, 375–399.

Djankov, S – Glaeser, E – La Porta, R – Lopez-de-Silanes, F – Shleifer, A (2004) Private credit in 129 countries. Working paper, Harvard University.

Djankov, S – Hart, O – Nenova, T – Shleifer, A (2005) **Efficiency in bankruptcy.** Working paper, Harvard University.

Djankov, S – La Porta, R – Lopez-de-Silanes, F – Shleifer, A (2004a) **Corporate theft.** Working paper, Harvard University.

Djankov, S – La Porta, R – Lopez-de-Silanes, F – Shleifer, A (2004b) **Courts.** Working paper, Harvard University.

Doukas, J (1995) **Overinvestment, Tobin's Q and gains from foreign acquisitions.** Journal of Banking & Finance, 1285–1303.

Eckbo, B E – Maksimovic, V – Williams, J (1990) **Consistent estimation of cross-sectional models in event studies.** Review of Financial Studies 3, 343–365.

Eun, C S – Kolodny, R – Scheraga, C (1996) **Cross-border acquisitions and shareholder wealth: tests of the synergy and internalization hypotheses.** Journal of Banking & Finance 20, 1559–1582.

Evanoff, D – Wall, L (2001) **SND yield spreads as bank risk measures.** Journal of Financial Services and Research 19, 121–146.

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Evanoff, D – Wall, L (2002) **Measures of the riskiness of banking organizations: Subordinated debt yields, risk-based capital, and examination ratings.** Journal of Banking & Finance 26, 989–1009.

Flannery, M J (1998) **Using market information in prudential bank supervision: a review of the U.S. empirical evidence.** Journal of Money, Credit, and Banking 30, 273–302.

Flannery, M J (2001) **The faces of market discipline.** Journal of Financial Services and Research 20, 107–119.

Flannery, M J – Sorescu, S M (1996) **Evidence of bank market discipline in subordinated debenture yields.** Journal of Finance 51, 1347–1377.

Focarelli, D – Pozzolo, A F (2001) **The patterns of cross-border bank mergers and shareholdings in OECD countries.** Journal of Banking & Finance 25, 2305–2337.

Fuller, K – Netter, J – Stegemoller, M (2002) **What Do Returns to Acquiring Firms Tell Us?** Evidence from Firms that Make Many Acquisitions. Journal of Finance 57, 1763–1793.

Gande, A – Puri, M – Saunders, A (1999) **Bank entry, competition, and the market for corporate securities underwriting.** Journal of Financial Economics 54, 165–195.

Grosse, R – Goldberg, L G (1991) **Foreign bank activity in the United States: an analysis by country of origin.** Journal of Banking & Finance 15, 1092–1112.

Harris, R S – Ravenscraft, D (1991) **The role of foreign acquisitions in foreign direct investment: evidence from the U.S. stock market.** Journal of Finance, 825–844.

Hellman, T – Murdock, K – Stiglitz, J E (2001) **Liberalization, moral hazard in banking and prudential regulation: Are capital controls enough?** American Economic Review 90, 147–165.

Jagtiani, J – Kaufman, G – Lemieux, C (2002) **The effect of credit risk on bank and bank holding company bond yields: evidence from the post-FDICIA period.** Journal of Financial Research 25, 559–575.

Jayaratne, J – Strahan, P (1998) **Entry restrictions, industry evolution, and dynamic efficiency: evidence from commercial banking.** Journal of Law & Economics 41, 239–273.

Kane, E (2000) **Incentives for banking mega-mergers: what motives might regulators infer from event study evidence?** Journal of Money Credit & Banking 32, 671–701.

Keeley, M C (1990) **Deposit insurance, risk, and market power in banking.** American Economic Review 80, 1183–1200.

Kim, E H – McConnell, J J (1977) **Corporate mergers and the co-insurance of corporate debt.** Journal of Finance 32, 349–365.

La Porta, R – Lopez-de-Silanes, F – Shleifer, A (1999) **Corporate ownership around the world.** Journal of Finance 54, 471–517.

La Porta, R – Lopez-de-Silanes, F – Shleifer, A (2002) **Government ownership of banks.** Journal of Finance 57, 265–302.

La Porta, R – Lopez-de-Silanes, F – Shleifer, A – Vishny, R (1997) **Legal determinants of external finance.** Journal of Finance 52, 1131–1150.

La Porta, R – Lopez-de-Silanes, F – Shleifer, A – Vishny, R (1998) **Law and finance.** Journal of Political Economy 106, 1113–1155.

La Porta, R – Lopez-de-Silanes, F – Shleifer, A – Vishny, R (2000) **Investor protection and corporate governance.** Journal of Financial Economics 58, 3–27.

La Porta, R – Lopez-de-Silanes, F – Shleifer, A – Vishny, R (2002) **Investor protection and corporate valuation.** Journal of Finance 57, 1147–1170.

Lowinski, F – Schiereck, D – Thomas, T W (2004) **The effect of cross-border acquisitions on shareholder wealth – evidence from Switzerland.** Review of Quantitative Finance & Accounting 22, 315–330.

Magee, S (1976) **Information and multinational corporation: an appropriability theory of direct foreign investment.** In: Jagdish Bhagwati, ed., The new international economic order. MIT Press, 317–340.

Martynova, M – Renneboog, L (2006) **Sources of transaction financing in corporate takeovers.** Working paper, European Corporate Governance Institute.

McCann, M (2001) **Cross-border acquisitions: the UK experience.** Applied Economics 33, 457–461.

Mishkin, F S (1999) **Financial consolidation: dangers and opportunities.** Journal of Banking & Finance 23, 675–691.

Moeller, S – Schlingemann, F – Stulz, R (1991) **Firm size and the gains from acquisitions.** Journal of Financial Economics 17, 81–96.

Morck, R – Yeung, B (1992) **Why investors value multinationality.** Journal of Business 64, 41–56.

Morgan, D P (2000) **Rating banks: risk and uncertainty in an opaque industry.** Staff Report no. 105. Federal Reserve Bank of New York.

O'Hara, M – Shaw, W (1990) **Deposit insurance and wealth effects: the value of being 'Too Big to Fail'.** Journal of Finance 45, 1587–1600.

Ongena, S – Penas, M F (2009) **Bondholders' Wealth Effect in Domestic and Cross Border Bank Mergers.** Journal of Financial Stability, forthcoming.

Peek, J – Rosengren, E S – Kasirye, F (1999) **The poor performance of foreign bank subsidiaries: were the problems acquired or created?** Journal of Banking & Finance 23, 579–604.

Penas, M F – Unal, H (2004) **Gains in bank mergers: evidence from the bond markets.** Journal of Financial Economics 74,149–180.

Penas, M F – Unal, H (2004) **Gains in bank mergers: evidence from the bond markets.** Journal of Financial Economics 74, 149–180.

Piloff, S J – Santomero, A M (1998) **The value effects of bank mergers and acquisitions.** In: Amihud, Y and Miller, G (Eds.), Bank Mergers and Acquisitions. Kluwer Academic Publishing, Boston.

Renneboog, L – Szilagyi, P (2007) **How do Mergers and Acquisitions Affect Bondholders in Europe? Evidence on the Impact and Spillover of Governance and Legal Standards.** Working Paper, Tilburgh University.

Repullo, R (2001) **A model of takeover of foreign banks.** Spanish Economic Review 3, 1–21.

Saunders, A (1999) **Consolidation and universal banking.** Journal of Banking & Finance 23, 693–695.

Saunders, A – Wilson, B K (1999) **The impact of consolidation and safety-net support on Canadian, U.S., and UK banks: 1893–1993.** Journal of Banking & Finance 23, 537–571.

Shleifer, A – Vishny, R (1997) **A survey of corporate governance.** Journal of Finance 52, 737–783.

Sironi, A (2001) **An Analysis of European Banks' SND Issues and its Implications for the Design of a Mandatory Subordinated Debt Policy.** Journal of Financial Services Research, Vol 20, No 2–3, 233–266.

Sironi, A (2003) **Testing for Market Discipline in the European Banking Industry: Evidence from subordinated debt issues.** Journal of Money, Credit & Banking, Vol 35, 3, 443–472.

Subrahmanyam, V – Rangan, N – Rosenstein, S (1997) **The role of outside directors in bank acquisitions.** Financial Management 26, 23–36.

Vander Vennet, R (1996) **The effect of mergers and acquisitions on the efficiency and profitability of EC credit institutions.** Journal of Banking & Finance 20, 1531–1588.

Winton, A (1999) **Don't put all your eggs in one basket? Diversification and specialization in lending.** Working paper. University of Minnesota, MN.

Appendix

Further note on empirical methods and estimations

The yield spread – market's assessment of the bank bond's risk – used in the paper is the difference between the yield bank bonds and government securities of comparable maturity in respective countries. As mentioned earlier, the measure of bond yield spreads is based on the weekly yield data where a firm's bond yields merge into a single yield by computing the market-value-weighted averages of individual bond yields. The methodology to measure the abnormal announcement effect of cross-border bank M&As on bond yield spreads and the test statistics for the abnormal effect on yield spreads are based on the Z-test is adopted and modified from Eckbo, Maksimovic, and Williams (1990) as shown in section 3.2. Amihud et al (2002) argue that in capturing risk in such transactions, an ideal measure would be to capture the combination of the risk of both the acquirer and the target in the premerger environment and compare them with the resulting entity. The authors actually provided some partial evidence using such measure with 12 mergers in their equity-based study. The attempt to do something similar with bond yields was difficult due to data limitations, and some weighted bond-yield measure for 31 of the sample M&As could be estimated. Additionally, the study attempted to create some risk measures of the target's outstanding cost of total debt by considering a weighted-average measure of the cost of the liability and its deviation from the weighted-average government security. The weighted averages in the premerger environment were compared with the post-merger weighted averages. Following the style of Amihud et al (2002), some positive changes in the risk profiles exist. An average premerger correlation of 0.0593 between the returns of the acquirers and targets was found. This relatively low correlation suggests potential diversification benefits for the acquirer, and the future returns are likely to be more correlated given the acquirer's likely intention to integrate the target into its own business model, which in turn is likely to increase the correlation of their returns thus possibly increase the acquirer's risk in the new environment. The mean changes in the total risk profile of these 31 cases – the premerger returns are the weighted average based on the market capitalization of the partners – is 0.0216 (t-statistics = 3.03) where the group involving targets with the same development status reveal a change by 0.0072 (t-statistics = 2.04) and a change by 0.0295 (t-statistics = 3.77) for the group involved with targets with different development status (eg, developed acquirer and developing target).

Additionally, our measure of bond-yield spreads may not be fully consistent with Amihud et al (2002), Penas and Unal (2004), and Renneboog and Szilagyi (2007). The first two papers use bond pricing provided by the Lehman Brothers

Bond Database (LBBD) available only for the 1973 to early 1998 period. Our sample in this paper only overlaps by two years with this LBBD data set, and only 29 bonds associated with 21 bank acquirers out of the 49 total bank acquirers in our sample that merged during the 1995–1997 period matched. For these banks both trader-quoted prices and matrix prices are available. Additional information came from Reuters on dealers' quotes for 30 bonds of 23 sample banks that differ from the LBBD data during the sample years. The Reuters data set is not exactly the same as the LBBD data as the quotes are only given for matrix prices rather than actual trade data. Though matrix prices are less reliable, they are used to combine the data sets for possible tests. None of these bonds were rated below BBB. This study follows Penas and Unal (2004) in organizing a maturity-adjusted holding-period return to compute the abnormal monthly returns on bonds and indexes with similar maturity characteristics. These indexes are taken from a Merrill Lynch corporate index, the Datastream bank index, or the EMU Corporate Index.

Consistent with the reported results in the text above, the news of mergers was associated with a negative change in the bond pricing in most windows. The statistical significance levels of the returns in the months around the announcement dates are also statistically significant although the significance level is not very strong. Given that these alternative estimations are based on 59 bonds from 44 banks only, the study uses an alternative method. This study uses yield data to construct bond returns using the following formula: $b_t = -n(r_{n,t} - r_{n-1,t-1})$ where $r_{n,t}$ is the yield on a bond with term to maturity and n equals the respective years of the bond maturity. Returns are computed by taking the first difference of the yields, multiplying this change in yields by the maturity, and then changing the sign (Cambell, Lo, and McKinlay, 1997). The formula for converting bond yields into returns is just an approximation, and the error from using the approximation should be small for frequently available data (Craine and Martin, 2008). Alternatively, the bonds are broken into two groups, short-term and long-term, and use 5- and 10-year maturity terms for these two groups respectively, finding similar results. Using this return data, the abnormal bond returns around the announcement dates are estimated. At this stage the study only report for weeks (0,0), (0,1), (-1,0), (-1,+1), as well as (-2,+2) and (-4, +4). Interestingly, consistent with the methods and predictions of Cambell, Lo, and Mackinlay (2007) and Craine and Martin (2008), when using the bond-return data extrapolated from the yield data, the results are not significantly different than the reported results although the statistical significance is not as strong. In all reported windows a negative sign suggests a drop in bond returns. This is consistent with our results where bond yields increase. Additionally, in order to see how close the converted results are, the study compares compared bond returns for 34 banks that had actual return data with the converted return data from the yield information using our formula above. These comparisons showed that although some

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differences exist between the results, they were quite similar. This provides an additional robustness to the reported results.

Table 1.   **Cross-border bank mergers and acquisitions, 1995–2002**

Panel A: National identities

Nation	Acquirers	Targets	Nation	Acquirers	Targets
Albania		1	Japan	2	3
W. Samoa		1	Latvia		2
Argentina		4	Liechtenstein		1
Australia	5		Lithuania		1
Austria	6	1	Luxembourg		4
Belgium	8	3	Malta		1
Bosnia		2	Mexico		3
Brazil		4	Monaco		1
Bulgaria		1	Morocco		1
Canada	11	2	Netherlands	15	3
Chile		1	Norway		2
Colombia		1	Panama		1
Croatia		1	Philippines		1
Czech Republic		1	Poland		15
Denmark	3	3	Romania		2
Egypt		2	Russian Fed		2
Estonia		2	Slovenia		3
Finland		2	South Africa		1
France	25	9	South Korea		2
Germany	33	8	Spain		3
Greece		2	Sweden	13	2
Hungary		2	Switzerland	4	3
India		1	Thailand		4
Indonesia		3	Tonga		1
Ireland-Rep	1	1	United Kingdom	14	7
Israel		1	United States	5	9
Italy	2	9	Yugoslavia		1

Panel B: Number of mergers and acquisitions

Year	Number of mergers
1995	14
1996	16
1997	19
1998	22
1999	22
2000	17
2001	22
2002	15

Panel C: Summary statistics

Variable	Definition	Mean	Standard deviation	Minimum	Maximum
SP	Yield spread	0.8017	0.4510	0.0145	2.8815
MAT	Remaining maturity	5.24	3.37	2	22
Issue value	Current market value of bonds	461.391	2,175.831	0.2444	39,910.23
Number of bonds	Number of bank bonds in SP	3.71	3.07	1	15
ALogTA	Log of total assets of acquirer	18.5999	1.3318	14.5246	20.6204
TLogTA	Log of total assets of target	14.7596	1.9353	10.3780	19.7422
AInvestor	Acquirer investor protection	5.71	0.85	4.00	7.00
TInvestor	Target investor protection	4.96	1.37	1.00	7.00
ADeposit	Acquirer deposit insurance	4.94	1.44	0.00	7.00
TDeposit	Target deposit insurance	4.81	1.54	0.00	7.00
Arecovery	Acquirer recovery rate	66.0	17.86	37.00	92.40
Trecovery	Target recovery rate	52.43	25.02	0.20	92.40
ACredit	Acquirer creditor rights	6.84	2.21	3.00	10.00
TCredit	Target creditor rights	4.83	2.52	0.00	10.00
ATough	Acquirer regulator toughness	2.76	1.52	0.00	5.00
TTough	Target regulator toughness	3.55	1.12	0.00	5.00
ATrans	Acquirer transparency	2.22	0.51	1.00	3.00
TTrans	Target transparency	2.42	0.62	1.00	4.00
AConcen	Acquirer concentration	0.58	0.29	0.21	0.91
TConcen	Target concentration	0.60	0.21	0.21	1.00
Income	Dummy variable for the same income level	0.52	0.50	0	1
Law	Dummy variable for the same origin of law	0.37	0.48	0	1
Lanquage	Dummy variable for the same language	0.06	0.24	0	1
DFX	Dummy variable for same currency	0.10	0.29	0	1
D100CS	Percentage of cash used in acquisitions	0.68	0.31	0.08	1

Table 2. **Overall announcement effects on yield spreads**

The measure of the announcement effect on the bank yield spreads of 147 institutions estimated directly as the parameter β_j in equation (3.1). Abnormal effects are averaged with equal weight across banks to form average abnormal effects. The test statistics are based on the Z-test. SP30 is the average abnormal effect based on the estimation window of 30 weeks before the start of the announcement window plus event windows. SP52 is the average abnormal effect based on the estimation window of 52 weeks before the start of the announcement window plus event windows. The cumulative abnormal effect on yield spreads for the specific event window is calculated as the number of weeks multiplied by its parameter β_j.

Panel A: Overall abnormal effect on yield spreads

Windows	SP30	SP52	Windows	SP30	SP52
(0, 0)	0.0413***	0.0751***	(-1W, +8W)	0.0501***	0.0850***
	(2.81)	(4.34)		(9.71)	(15.65)
(0, +1W)	0.0404***	0.0742***	(-4W, 0)	0.0476***	0.0810***
	(3.49)	(5.80)		(6.11)	(9.17)
(-1W, 0)	0.0368***	0.0716***	(-4W, +4W)	0.0530***	0.0865***
	(2.62)	(5.26)		(9.61)	(13.69)
(-1W, +1W)	0.0385***	0.0733***	(-4W, +52W)	0.0715***	0.1050***
	(3.41)	(6.62)		(18.56)	(30.28)
(-2W, +2W)	0.0456***	0.0806***	(-1W, +26W)	0.0625***	0.0973***
	(5.18)	(9.06)		(16.26)	(26.76)
(-1W, +4W)	0.0455***	0.0804***	(-1W, +52W)	0.0629***	0.0977***
	(6.69)	(10.96)		(16.93)	(29.30)

Panel B: Abnormal effect on yield spreads of positive group (n=96) vs negative group (51)

Windows	Positive SP30	Negative SP52	Positive SP30	Negative SP52
(0, 0)	0.1606***	-0.1178***	0.1857***	-0.1212***
	(10.05)	(-7.31)	(10.02)	(-6.11)
(0, +1W)	0.1667***	-0.1190***	0.1927***	-0.1130***
	(14.43)	(-10.97)	(14.43)	(-8.81)
(-1W, 0)	0.1529***	-0.1171***	0.1913***	-0.1082***
	(9.57)	(-7.02)	(9.62)	(-5.49)
(-1W, +1W)	0.1711***	-0.1156***	0.1891***	-0.1148***
	(17.26)	(-13.58)	(16.88)	(-10.79)
(-2W, +2W)	0.1679***	-0.1221***	0.1930***	-0.1131***
	(21.68)	(-17.41)	(21.79)	(-13.65)
(-1W, +4W)	0.1741***	-0.1259***	0.1990***	-0.1181***
	(24.80)	(-18.42)	(24.97)	(-14.38)
(-1W, +26W)	0.2185***	-0.1577***	0.2297***	-0.1596***
	(50.31)	(-34.50)	(54.61)	(-30.18)
(-1W, +52W)	0.2186***	-0.1902***	0.2597***	-0.1509***
	(54.04)	(-41.45)	(67.67)	(-37.19)
(-4W, +52W)	0.2342***	-0.1712***	0.2598***	-0.1466***
	(54.67)	(-37.47)	(66.56)	(-35.78)

Panel C: Announcement effects on yeld spreads
The relative size effect of target and acquirer abnormal effects on yield spreads are based on SP30, the estimation window of 30 weeks before the start of the announcement window plus event windows. The quartiles are based on the ratio of the target's total assets to the acquirer's total assets.

Windows	1st quartile	2st quartile	3st quartile	4st quartile
(0, 0)	0.0127	0.0237	0.0335*	0.1266***
	(0.03)	(1.20)	(1.83)	(3.23)
(0, +1W)	-0.0035	0.0255	0.0467**	0.1389***
	(-0.61)	(1.62)	(2.47)	(5.43)
(-1W, 0)	0.0060	0.0161	0.0353*	0.1227***
	(0.14)	(0.68)	(1.91)	(4.39)
(-1W, +1W)	-0.0013	0.0204	0.0441**	0.1338***
	(-0.52)	(1.11)	(2.55)	(6.28)
(-1W, +26W)	-0.0366	0.0835***	0.1095***	0.1155***
	(-1.39)	(8.30)	(13.27)	(10.94)
(-1W, +52W)	0.0419***	0.0619***	0.1220***	0.0838***
	(6.34)	(9.34)	(13.50)	(6.59)

*,**,*** indicate significance at the 0.10, 0.05, and 0.01 significance level respectively.

Table 3. **Abnormal returns to bidders in cross-border bank M&As (n=140)**

The announcement abnormal return to stockholders is estimated by the three-factor model $R_{jt} = \alpha + \beta_{world,j}R_{world,t} + \beta_{home,j}R_{home,t} + \beta_{host,j}R_{host,t} + \varepsilon_{jt}$. Abnormal returns are averaged with equal weights across banks to form the average abnormal return. CAAR is the cumulative average abnormal return to acquiring banks. The test statistics are based on the t-test reported in the parentheses (CAAR and CAR in %).

Panel A: Abnormal returns to bidders

Window (day)	CAAR (t-statistics)	Max CAR (t-statistics)
(-5, 0)	0.5708**	11.71
	(2.07)	(-9.54)
(0, 0)	0.2127*	7.28
	(1.76)	(-2.96)
(-1, 1)	0.2875*	6.31
	(1.71)	(-3.68)
(0, 5)	-0.1321	12.39
	(-0.57)	(-8.66)
(-5, 5)	0.2260	11.75
	(0.71)	(-11.48)

Panel B: Average CAR for bidders, sorted by positive (n=82) and negative (n=58) CARs

Window (days)	Positive CAAR (t-statistics)	Negative CAAR (t-statistics)
(-5, 0)	4.08***	-3.28***
	(9.04)	(-7.44)
(0, 0)	1.75***	-1.09***
	(8.19)	(-8.79)
(-1, 1)	1.70***	-1.21***
	(9.05)	(-9.57)
(0, 5)	3.37***	-2.87***
	(7.64)	(-8.80)
(-5, 5)	4.40***	-4.77***
	(9.28)	(-9.16)

Panel C: Abnormal returns to bidders, sorted by positive and negative abnormal changes in yield spreads

Window (day)	Positive AESP group CAAR (n=82) (t-statistics)	t-statistics on the differences in abnormal returns between similar Window groups in Panel B and Panel C	Negative AESP (n=58) group CAAR (t-statistics)	t-statistics on the differences in abnormal returns between similar Window groups in Panel B and Panel C
(-5, 0)	0.76**	2.98***	0.30	1.70*
	(2.18)		(0.67)	
(0, 0)	0.22	1.83*	0.20	1.96**
	(1.44)		(1.03)	
(-1, 1)	0.36*	3.37***	0.19	1.75*
	(1.67)		(0.72)	
(0, 5)	-0.06	1.02	-0.22	1.22
	(-0.22)		(-0.57)	
(-5, 5)	0.74*	2.85***	-0.36	1.04
	(1.82)		(-0.73)	

*,**,*** indicate significance at the 0.10, 0.05, and 0.01 significance level respectively.

Table 4.   **Overall regression of abnormal effect on yield spreads (AESP) on CAR**

We use the following model to test the wealth transfer: $AESP_i = \alpha + \beta * CAR_i + \varepsilon_i$. Abnormal effects on yield spreads are based on the estimation window of 30 before the start of announcement window. AESP00 is abnormal effects on yield spreads for the window of (0, 0), AESP10 is abnormal effects on yield spreads for the window of (-1W, 0), AESP01 is abnormal effects on yield spreads for the window of (0, +1W), and AESP11 is abnormal effects on yield spreads for the window of (-1W, +1W). The event window for CAR is 0 days to 0 days (0, 0), -1 day to 1 day (-1, +1), -5 days to 0 days (-5, 0), 0 days to +5 days (0, +5), and -5 days to +5 days (-5, +5).

Dependent variable/ (CAR window)	Coefficient of CAR	Constant	Adj-R	Number of obs.
AESP10/(-5, 0)	1.5399***	0.0254	0.0494	140
	(2.87)	(1.43)		
AESP00/(0, 0)	0.9227	0.0356*	-0.0033	140
	(0.74)	(1.98)		
AESP01/(0, +5)	0.1586	0.0364**	-0.0068	140
	(0.81)	(2.06)		
AESP00/(-1, +1)	0.4376	0.0363**	-0.0055	140
	(0.49)	(2.01)		
AESP11/(-5, +5)	1.1613**	0.0325*	0.0363	140
	(2.50)	(1.86)		

Table 5.   **Regression of abnormal effect on yield spreads (AESP) and CAR on deposit insurance**

We use the following model to test the wealth transfer: $AESP_i = \alpha + \beta_1 * CAR_i + \beta_2 * DepositInsurance_i + \varepsilon_i$. Abnormal effects on yield spreads are based on the estimation window of 30 before the start of announcement window. AESP00 represents the abnormal effects on yield spreads for the window (0, 0), AESP10 represents the abnormal effects on yield spreads for the window (-1W, 0), AESP01 represents the abnormal effects on yield spreads for the window (0, +1W), and AESP11 represents the abnormal effects on yield spreads for the window (-1W, +1W). The event window for CAR is 0 days to 0 days (0, 0), -1 day to 1 day (-1, +1), -5 days to 0 days (-5, 0), 0 days to +5 days (0, +5), and -5 days to +5 days (-5, +5).

Dependent variable	CAR	Deposit insurance	Constant	Adjusted R^2	F-statistic	Number of obs.
AESP00	0.8657	-0.0306	0.0319	-0.0053	0.65	133
	(0.72)	(-0.81)	(1.52)			
AESP10	1.5598***	-0.0314	0.0239	0.0542	4.78***	133
	(2.98)	(-0.83)	(1.15)			
AESP01	0.0741	-0.0260	0.0328	-0.0117	0.24	133
	(0.12)	(-0.68)	(1.57)			
AESP11	1.1482**	-0.0344	0.0328	0.0353	341**	133
	(2.51)	(-0.90)	(1.58)			

Table 6.   **Regression of announcement week (-1W, 0) abnormal effects on yield spreads**

The sample includes 147 cross-border bank M&As announced and completed between 1995 and 2002. The dependent variable is AESP; AESP is the measure of announcement-week abnormal effects on yield spreads and is estimated directly as the parameter β_j in equation (3.1), based on the SP30 estimation windows. The study uses the natural logarithm of 1 plus the parameter β_j. *Investor* is a dummy variable measuring relative investor legal protection of two countries and is taken from Djankov et al (2005). The variable takes a value of 1 if a target country has better investor protection than an acquirer country. *Recovery* is a dummy variable and takes a value of 1 if a target country has better recovery rate than an acquirer country. The variable measures the relative recovery rate of two countries and is developed by Djankov et al (2005). *Deposit insurance* captures the moral-hazard problems; the index is developed by Demirguc-Kunt and Detragiache (2002). The measure is the natural logarithm of the ratio of a target country's index to an acquirer's country index. *Tough* is a relative toughness index of bank supervisors in target and acquirer countries. *Trans* is the ratio of the transparency in a target country to the transparency in an acquirer country. Both *Tough* and *Trans* are calculated based on information from the World Bank database (2004). *Concent* is a dummy variable that takes a value of 1 if a target country has a higher banking concentration than an acquirer country, otherwise the variable takes a 0. The index is from Barth et al (2001). *Creditor* is the ratio of target country's creditor rights to an acquirer's country index; the index is developed by La Porta et al (1998) and further elaborated in Djankov et al (2004). *Law* is a dummy variable that is equal to 1 if an acquirer and a target have the same legal origins, otherwise the variable is 0. A country's legal origin is taken from La Porta et al (1998) and Djankov et al (2004). *Income* is a dummy variable that takes a value of 1 when countries have the same income levels; otherwise the variable is 0. *DFX* is a dummy variable that takes a value of 1 when countries have the same currency; otherwise it is 0. *D100CS* is the percentage of cash paid for the acquisition. *LogTAacq* is the natural logarithm of an acquirer's previous year of total assets before the M&A. *ROEacq* is the acquirer's prior-year return on equity before the M&A. *TETAacq* is the acquirer's prior-year ratio of total equity to total assets before the M&A. *LLRacq* is the prior-year ratio of loan-loss reserves to total loans for the acquiring bank before the M&A.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
C	0.1746	-0.1934	0.2096	0.1571	-0.0071	-0.4041	0.0481	-0.5780	-0.2246	-0.5366
	(0.60)	(-0.65)	(0.62)	(0.44)	(-0.03)	(-1.11)	(0.01)	(-1.52)	(-0.78)	(-1.47)
Investor	-0.0854**	-0.1243**	-0.0868*	-0.0920**	-0.1226**	-0.21199***	-0.1270**	-0.2095***	-0.1933**	-0.2623***
	(-1.98)	(-2.18)	(-1.94)	(-2.00)	(-2.55)	(-2.99)	(-2.54)	(-3.33)	(-2.39)	(-3.50)
Deposit insurance	0.1419***	0.1480**	0.1211*	0.1186*	0.1678***	0.1735***	0.1460**	0.1810***	0.1187*	0.1468**
	(2.84)	(2.70)	(1.84)	(1.85)	(2.73)	(2.92)	(2.18)	(2.89)	(1.91)	(2.30)
Tough			0.0112	0.0120			0.0273	0.0371	0.0318	0.0363
			(0.48)	(0.56)			(1.298)	(1.32)	(1.09)	(1.42)
Trans			-0.0137	-0.0185			-0.0377		-0.0382	-0.0677
			(-0.28)	(-0.26)			(-0.86)		(-0.85)	(-1.49)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Recovery	-0.0285 (-0.67)	-0.0021 (-0.05)	-0.0188 (-0.44)	-0.0329 (-0.75)	-0.0446 (-0.87)		-0.0421 (-0.86)		-0.0008 (-0.02)	-0.0301 (-0.54)
Creditor					0.0540 (1.39)	0.0639 (1.54)	0.08126* (1.88)			0.1092** (2.16)
Concent					0.0435 (0.81)	0.0581 (0.98)	0.0772 (1.47)	0.1011 (1.63)		0.1116 (1.62)
DFX			0.0950* (1.96)	0.0979* (1.99)	0.08106* (1.76)	0.0975 (1.59)	0.1059** (2.08)		0.0928 (1.51)	0.11862* (1.90)
C100CS		0.0531** (1.97)	0.0555* (1.83)	0.0637* (1.84)	0.0659* (1.68)	0.0782** (2.32)	0.0731* (1.72)	0.0695* (1.88)	0.1044** (2.52)	0.1019** (2.68)
Law						-0.0187 (-0.38)		0.0204 (0.46)	-0.0477 (-1.01)	-0.0332 (-0.69)
Income						0.0384 (0.72)			0.0962 (1.51)	0.0834 (1.53)
LogTAacq	-0.0073 (-0.48)	0.0056 (0.38)	-0.0124 (-0.75)	-0.0080 (-0.47)	-0.0023 (-0.12)	0.0112 (0.63)	-0.0080 (-0.49)	0.0150 (0.85)	0.0010 (0.07)	0.0085 (0.48)
ROEacq				-0.1493 (-1.02)	-0.1512 (-0.99)				0.0591 (0.41)	0.0204 (0.15)
TETAacq		0.0444 (0.64)		-0.0066 (-0.11)	0.0148 (0.22)	0.0184 (0.33)		0.0820 (0.96)	0.0084 (0.27)	0.0451 (0.63)
LLRacq		2.4351* (1.67)				2.6259* (1.69)		3.0211* (1.78)	4.4718** (2.41)	5.0749** (2.50)
Adjusted R^2	0.1916	0.1351	0.1285	0.1396	0.1586	0.2273	0.1692	0.2141	0.1961	0.2827
F-statistic	3.04**	1.88*	2.21**	1.88*	2.11**	1.95**	1.95**	1.58	1.49	1.77*
Number of obs.	120	100	120	119	117	98	118	98	100	98

*, **, *** indicate significance at the 0.10, 0.05, and 0.01 significance level respectively.

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