

# **The Effect of Cross-Border Bank M&As on Bank Risk: Evidence from Yield Spreads**

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# The Effect of Cross-Border Bank M&As on Bank Risk: Evidence from Yield Spreads

**Abstract:** The impact of cross-border bank M&As on bank risk remains an open question. While geographically diversifying bank M&As have the potential to reduce the risk of bank insolvency, they also have the potential to increase risk due to the increase in risk-taking incentives by bank managers and shareholders 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. It also investigates the effects of differences in the institutional environments between bidder and target countries on changes in yield spreads following M&As announcements. Unlike domestic bank mergers we find that bondholders, in general, perceive cross-border bank M&As as risk-increasing activities. Our evidence shows that, on average, yield spreads increase by 4.8 basis points following the announcement of cross-border M&As. We also find that the announcement period changes in yield spreads are significantly affected by the differences in investor protection and the extent of moral hazard environments between the transacting countries. However, we do not find that the banking regulatory and supervisory environment of the transacting parties countries significantly impact the changes in yield spreads.

## 1. INTRODUCTION

A number of recent studies have addressed the geographical diversification of banks through cross-border mergers and acquisitions (see, e.g., See Vander Venet, (1996), Winton (1999), Berger, DeYoung, Genay, and Udell (2000) and Amihud, DeLong, and Saunders (2002)). Although the effects 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 remain an open question. We examine this issue in this paper.

Berger (2000), among others, suggests that geographically diversifying bank mergers reduce the risk of bank insolvency if the combined bank's earning and cash flow volatilities are reduced. This, he points out, happens because the returns of loans issued in different countries have relatively low co-variation. On the other hand, other studies (e.g., Keeley, 1990), have pointed out that there are also risk-increasing effects due to the incentives of bank managers and shareholders to shift risk when the regulatory safety net and its associated implicit and explicit guarantees are underpriced<sup>1</sup> Winton (1999) points out that geographical diversification 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 effort of regulators, both the Second Banking Co-ordination 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

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<sup>1</sup>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).

cross-border bank merger.<sup>2</sup> Such uncertainty regarding the ultimate responsibility of supervision in cross-border events increases risk to both the banks and regulators. Therefore, it is extremely important for both home and host countries' supervisors to accurately assess 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?

Cross-border bank M&As have important implications for bank managers, bondholders, and stockholders as well as to regulators. Amihud, DeLong, and Saunders (2002) are the first and only paper to date, to empirically investigate 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 interest of equity holders is often in conflict with the interests of bond holders and regulators who prefer avoiding undue risk-taking (Flannery (2001)). This is because, while bondholders and regulators bear risk and take losses when bank condition deteriorates, they do not share the potential upside gains of risk-taking activities that only accrue to bank managers and shareholders. Thus, the study by Amihud, DeLong and Saunders, although providing important insights about cross-border M&As impact on equity holders, is incomplete in that it ignores other important bank stakeholders most notable bondholders and regulators.

In this paper we investigate the impact of cross-border bank mergers and acquisitions on bond yields and therefore on the riskiness of acquiring banks. We use 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. Moreover, Jagtiani, Kaufman, and Lemieux (2002) argue that yield spreads in bank debentures

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<sup>2</sup> Both the Second Banking Co-ordination Directive of 1989 in Europe and the Core Principles for Effective Banking Supervision of the Basel Committee on Banking Supervision (1997) suggest that the regulation of home country, not the regulation of the host country, should be responsible for the supervision of combined bank. However, the host country supervisors are jointly involved with regulatory matters of these subsidiaries given that they are registered banks in the host country.

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. Indeed, many empirical studies on bank debentures strongly support the notion that bond yield spreads accurately reflect bank risk.<sup>3</sup>

We also present cross-sectional analysis 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, we provide evidence as to the extent of the importance of institutional and regulatory factors such as investor protection, recovery rate, moral hazard, 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 is the first paper that examines the effects of cross-border bank M&As on bank risks using bond market data. Our understanding on the effect of cross-border bank M&As on its constituent stakeholders is not complete without an understanding of its impact on one of the most important class of stakeholders - bondholders

Using the bond yield spreads of acquiring banks involved in 147 cross-border mergers completed during the 1995 to 2002 period, we find that the announcement effects of these cross-border M&As are positive and significant. This indicates that there is 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 following the cross-border merger or acquisition. This finding is different from the results for domestic (U.S.) bank mergers reported by Penas and Unal (2004), who find that these consolidations are risk-reducing transactions. Moreover, unlike Penas and Unal results, we do not find evidence of any significant wealth transfer from bond holders to shareholders. However our results show that the acquirer's country's investor protection and recovery rate have a significant impact on the

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<sup>3</sup> 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.

changes in bank yield spreads following M&As announcements.<sup>4</sup> We also find that the difference in the level of moral hazard in the banking industry of the two countries affects the changes in yield spreads.<sup>5</sup> Interestingly, we find that the relative toughness of bank supervisors does not affect yield spreads changes resulting from the merger or acquisition announcement.

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 and section 4 reports the event study analysis while section 5 presents cross-sectional results. Section 6 concludes the study.

## **2. TESTABLE HYPOTHESES**

In this section, we develop several testable hypotheses regarding the effects of cross-border bank mergers and acquisitions upon acquiring banks' risk, which we proxy by the yield spreads of bonds. Additionally, we bring several bank- and country-specific characteristics as potential factors associated with the abnormal changes in yield spreads. Appendix 2 summarizes expectations that stem from the literature, expected impact of the various factors, and our actual findings.

### *2.1. Bank Risk*

Current research suggests that cross-border bank mergers have the potential to reduce the risk of bank insolvency (Vander Venet (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, the bank's earnings can be stabilized more

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<sup>4</sup> 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 (see, e.g., La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 2002) and Acharya and Bharath (2004)).

<sup>5</sup> If an acquiring bank is from a country in which the moral hazard is higher relative to that of a target country, the effects on yield spreads are found to be significantly higher. This suggests that bond holders perceive that excessive risk-taking by bank managers due to the moral hazard problem that may lead to bank insolvency. This is consistent with the findings by Demirguc-Kunt and Detragiache (2002).

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, there are also risk increasing effects from the incentive of banks to shift risk when the regulatory safety net and its associated implicit and explicit guarantees are underpriced, and when there are new and risk-increasing monitoring problems (Repullo (2001) and Winton (1999)).

In addition, factors such as geographical distance, different language and cultures, and differences in regulatory and supervisory norms may adversely affect the 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 new sectors or regions are likely to perform worse. This not only lessens the bank's monitoring incentives but also increases the chance of bank failure.

## 2.2. Moral Hazard

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 scheme may lead to greater moral hazard 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 are the risk taking incentives for banks. Deposit insurance may make depositors less likely to enforce market discipline on banks and may induce banks to take additional risks.<sup>6</sup> 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 crisis. Thus, a more generous deposit insurance scheme may lead to greater moral hazard for bank managers. Therefore, *ceteris paribus*, the higher the moral hazard caused by more generous deposit insurance of target banks'

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<sup>6</sup> See, Bhattacharya, Boot, and Thakor (1998) and Demirguc-Kunt and Detragiache (2002).

countries relative to acquirers' countries' the greater the likelihood of an increase in the risk of bank failure, thereby leading to higher yield spreads.

### *2.3. Investor Protection*

La Porta, Lopez-de-Silanes, Shleifer, and Vishny (LLSV) (1997) and (1998) show that the extent of legal protection of investors is an important determining factor of the financial market development of the country. The better protection of investors, both shareholders 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 get paid to them as dividends or interest. This is because with better legal investor protection firm 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 as support for the latter conjecture that with strong legal protection expropriation of minority shareholders wealth is substantially reduced. Higher investor rights may thus be interpreted as less risk to investor. By limiting expropriation, assuming all other things are equal, the risk of investments decreases. Therefore, if a bank takes over a financial institution in a country with higher investor legal protection compared to its' own country's, bank risk should not increase and in fact may decline.

### *2. 4. Recovery Rate*

The recovery rate is defined as how many cents on the dollar claimants recover from an insolvent firm.<sup>7</sup> 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)). This implies that the higher recovery rate can be interpreted as a high probability of recovering its loans, and thus

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<sup>7</sup> We adopt the definition of recovery rate from World Bank, the measure is developed in "Efficiency in Bankruptcy," an ongoing research by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2004b).



relatively lower risk. 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 of its yield spreads.

## *2. 5. Regulation and Supervision*

Berger et al. (2000), Focarelli and Fozzolo (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 influence 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 enhances bank transparency thus creating a safer financial system, thereby enabling banks to expand their activities abroad (Berger, DeYoung, Genay, and Udell (2000)). The stronger regulation and supervision of acquiring banks' countries compared to target countries increase the chances of better performance due to global advantages. This reduces the risk of bank failure thus leading to lower yield spreads.

However, regulations and restrictions of the banking system can also lead to cross-border M&As that may result in risk being increased. Regulatory restrictions 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 their activities abroad to bypass restrictions. Therefore, if cross-border bank M&As are used as a mechanism to bypass its own governmental regulations and supervisions, it increases the chance of bank insolvency due to the diseconomies of operating or monitoring an institution from a distance.<sup>8</sup> Peek, Rosengren, and Kasirye (1999) argue that this is the main reason for the poor performance of foreign banks. This implies that the regulation and supervision of acquiring banks' countries

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<sup>8</sup> This view is the home field advantage argument of Berger, DeYoung, Genay, and Udell, (2000).

compared to target countries may increase the risk of bank failure, resulting in higher yield spreads. In sum, the effect of the regulatory and supervisory environment of a country's banking system is uncertain and is therefore an empirical issue.

## 2. 6. *Additional Factors*

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.<sup>9</sup> Djankov et al.(2004a) examine the importance of information and power theories of credit in explaining the variation in the size of private credit markets around the world. They find that countries with stronger legal protection of creditors have deeper credit markets and suggest that the power to seize and liquidate collateral by secured creditors supports a successful debt market. The higher creditor rights can be interpreted as less risk of not recouping its loans from borrowers. Therefore, if a bank takes over a financial institution in a country with higher creditor rights, assuming all things are equal, it is likely that the risk of banks would decrease. On the other hand, if a bank expands to a country with lower creditor rights, the bank may increase its risk due to creditor's fear of not getting any 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 with a few large banks will be less risky than banking systems with many small banks (Beck, Demirguc-Kunt, and Levine (2003). Allen and Gale (2000) argue that it is easier to monitor a few large banks than many small banks. This suggests that the risk of the banking sector is less in a concentrated banking system. Even if the banking system is unstable, banking concentration may lead to the TBTF policy. In any case, bank risk is expected to be reduced in an increasingly concentrated banking system. On the other hand, a highly concentrated banking

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<sup>9</sup> The power theory of credit is formalized by Townsend (1979) and Aghion and Bolton (1992).

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 which may eventually result in bank insolvency. In addition, banks in countries with highly concentrated banking sector and with greater market power charge higher interest rates to firms and the high interest rate may in turn induce firms to pursue riskier projects that may result in insolvency. Finally, if bank size is positively correlated with complexity, it is much more difficult to properly monitor large banks than many small less complex banks (Beck, Demirguc-Kunt, and Levine, (2003). Therefore, it is difficult to predict the impact of relative banking concentration on changes in bank yield spread of acquiring banks.

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 lower 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. We define a cross-border merger as 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). We obtain data on cross-border bank mergers and acquisitions from Thomson Financial SDC Platinum. The initial screening resulted in 890 cross-border mergers that met our criteria. We dropped mergers where the acquirer's stock is not publicly traded and bond returns and yield spreads were not available through Datastream. We also excluded M&As in which the acquirer is from a country for which Datastream does not provide information on the government bonds of that country. If an acquirer announces the purchase of another bank within 6 months before or after the first announcement, we drop the second announcement from the sample. Finally, an acquiring bank needs to have at least one bond outstanding with a remaining maturity of greater than 2 years. Our final sample consists of 147 cross-border bank mergers.

Bank- and country specific data were obtained from several sources. Banks' financial data were obtained from Fitch-IBCA Bankscope database, while individual bond data and the government bond data of acquiring bank's country are from Datastream. The Bankscope database provides a detailed set of variables that captures banking activities as well as other financial data that are not available in other financial data sources. We include several country-specific regulatory and supervisory variables from Barth et al. (2001) and the World Bank database (2004). We also obtained many institutional variables such as creditor rights, recovery rates, income level, and the level of enforcing contract from the World Bank and several papers.

### *3.2. Methodology*

We define the yield spread as the difference between the yield on a bank bond and a government security of that country with comparable maturity. This spread reflects the market's assessment of the risk of the security (Gande, Puri, and Saunders (1999)). Our measure of bond yield spreads is based on the weekly yield data from Datastream. We combine all of a firm's bond yields into a single yield by computing market value weighted averages of individual bond yield. Our 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). We use weekly yield data (to control for thin trading that is usually a characteristic of bond markets) and abnormal changes in yield spreads due to the M&As announcements are estimated directly as the parameter  $\beta_j$  in the following model:

$$SP_{jt} = \alpha_j + \beta_j d_{jt} + e_{jt} \quad (1)$$

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 which takes the value of 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 based on an estimation window of 35 weeks (-30,+4) and are adjusted for heteroskedasticity and serial correlation. The abnormal effects are averaged with equal weights across banks to form the average abnormal effects. The test statistics for the abnormal effect on yield spreads are based on the Z-test.<sup>10</sup>

### 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. In this section, we describe these variables, how they are measured and explain why we use them in our analysis.

As pointed out earlier, the measure of announcement-week effects on bank yield spreads is estimated directly as the parameter  $\beta_j$  in equation (1). In the cross-section regression models, we use the natural logarithm of one plus the parameter  $\beta_j$  to correct for the high kurtosis that characterizes the  $\beta_j$  parameter. To capture the moral hazard problems due to the deposit insurance of each country, we include the index of moral hazard developed by Demirguc-Kunt

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<sup>10</sup> See Eckbo, Maksimovic, and Williams (1990) for more details on Z-test.

and Detragiache (2002) which is obtained from the World Bank database (2004).<sup>11</sup> The higher value of this variable, the greater is the country's moral hazard.

LLSV (1998) use a country's legal origin as a proxy for legal protection of investors, while Buch and DeLong (2004) show that a country's legal system has a positive impact on the likelihood of cross-border M&As. Following these authors we use a country's legal origin as a measure of investor protection. The measure of investor legal protection is taken from Djankov et al. (2004b) which is also from the World Bank's database (2004).<sup>12</sup> There are five main legal origins: English, French, German, Nordic, and Socialist and we include a dummy variable that is equal to one if an acquirer and a target have the same legal origin, 0 otherwise. Buch and DeLong (2004) 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 we include a dummy variable if the target and the acquirer have the same language.

As discussed above, 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.<sup>13</sup> Following Buch and DeLong (2004), we use two measures of bank regulation and supervision - toughness and transparency, obtained from the World Bank database (2004). The toughness measure is an index based on certain aspects of the bank supervisory environment and is constructed as the sum of dummy variables assumed to capture the toughness of the supervisory

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<sup>11</sup> The index is the sum of the following dummy 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 explicit covered, and (viii) interbank deposits are formally guaranteed.

<sup>12</sup> The index captures seven ways of enhancing investor protection: (i) information on family, (ii) indirect ownership, (iii) beneficial ownership, (iv) voting agreements between shareholders, (v) audit committees that review and certify financial data, (vi) a legal requirement that external auditors be appointed, and (vii) public availability of ownership and financial information.

<sup>13</sup> The studies include Berger, DeYoung, and Udell (2001), Focarelli and Fozzolo (2001), Buch and DeLong (2004), Jayaratne and Strahan (1998), Saunders (1999).

environment.<sup>14</sup> The transparency index is an index based on disclosure requirements in the banking industry and is computed as the sum of dummy variables capturing several aspects of bank disclosures.<sup>15</sup> We also include a measure of banking concentration of each country which is obtained from the World Bank Database (2004). This is a measure of 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 spread is uncertain. On one hand it may lead to the TBTF phenomenon, thereby alleviating depositors concern about bank failure, resulting in less compensation being required as compensation for default risk. On the other hand, bank concentration may also lead 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 et al. (2004a) to measure the creditor protection within a given country. This index is equal to the sum of each of the four rights of secured lenders that are defined in laws and regulations.<sup>16</sup> 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*. We also include the recovery rate developed by Djankov et al (2004a), and Shleifer (2004b). This variable calculates how many cents on the dollar claimants recover from an insolvent firm and is obtained from the World Bank database (2004). Finally, we include bank-specific variables which have been shown to be

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<sup>14</sup> The supervisors' aspects are follows: (i) Are supervisors legally liable for their actions?, (ii) Can the supervisory agency supersede bank shareholder rights and declare 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?

<sup>15</sup> The transparency index captures the following aspects: (i) Are consolidated accounts covering bank and any non-bank financial subsidiaries required? (ii) Do regulations require credit ratings for commercial banks?, (iii) Must banks disclose risk management procedures to public?, (iv) Are off-balance sheet items disclosed to public?

<sup>16</sup> The index is calculated by examining following aspects: (i) there are restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization. (ii) secured creditors are able to seize their collateral after the reorganization petition is approved. (iii) secured creditors are paid first out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors such as government or workers. (iv) if management does not retain administration of its property pending the resolution of the reorganization.

important in explaining bank risk. 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, Netherlands, and United Kingdom are most active both in acquisitions and being the targets of acquisitions. Most of the acquirers are from developed countries with high income levels. On the other hand, target banks 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 our different data set. We constrain our data set to only cross-border bank M&As in which we can find bond information on acquirers. The bond data requirements constrain our data set, resulting in a different distribution of acquirers and targets than those contained in the Amihud et al. sample.

Table 1, Panel B shows the year each merger was announced. We have 14 mergers in 1995 and the number increases up to 22 and in 1998 and 1999. By 2002, there are 15 M&As that provide us with the requisite acquirer's bond information. Panel C of Table 1 shows descriptive statistics of variables we use in this paper. The average yield spreads is about 80 basis points with maximum of 288 bps and minimum of 1.45 bps. On average, bonds have a remaining maturity of 5.24 years with average market value of \$461 million.

## **4. EMPIRICAL RESULTS**

### *4.1. Cross-border bank M&As and yield spreads*

In this section, we examine the effects of cross-border bank M&A announcements on yield spreads, which proxy for the riskiness of acquiring banks. The literature suggests that there are two potential effects that cross-border bank mergers may have 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 level of moral hazard, investor protection, recovery rate, creditor rights, geographical distance, different language and cultures, and differences in regulatory and supervisory norms may affect the risk. The event study methodology explained in Section 3 is used to measure the abnormal effect of announcements on yield spreads.

Panel A in Table 2 presents the average abnormal effect of announcements on yield spreads for the full sample. We use two different estimation windows  $t=(-30, -4)$  (SP304) and  $t=(-52, -4)$  (SP524) to estimate the model parameters. We also varied the announcements windows and the results were robust to these different specifications.<sup>17</sup> The table shows that the abnormal effects are all positive and statistically and economically significant irrespective of the announcement windows. The results indicate that the bond market reacts negatively suggesting that bond holders perceive cross-border bank M&As as risk increasing activities in general. Panel B of Table 2 contain results when we separate 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. It is interesting to note that in all cases the positive abnormal effects are higher than the corresponding negative effect and although not shown are also always significantly so. The importance of these results is that they suggest there is an asymmetric effect of cross-border bank M&As on acquirers yield spreads.

Overall, our results suggest that bondholders of acquiring banks require higher yields to be compensated 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 mergers and acquisitions.

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<sup>17</sup> Additionally, we have used delta spreads, 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 from the authors.

For instance, Penas and Unal (2004) find that the average bond returns to acquirers are positive suggesting that bond markets perceive bank mergers as default-risk reducing transactions. In contrast, our results suggest that in general cross-border bank M&As are perceived as risk-increasing activities to bond holders.

#### *4.2. Effects of cross-border bank M&As on bond yield spreads: Additional Analysis*

In this sub-section we examine the effect of cross-border bank M&As on yield spreads by forming groups based on the differences in acquirers and targets country characteristics. Specifically, we form groups based on investor legal protection, recovery rate, moral hazard, creditor rights, toughness and transparency of the banking environment, creditor rights, banking concentration, origin of law, income level, and language.

Results are reported in Table 3 and are based on an announcement window of  $t = (-1, +1)$ . Column 1 (2), contains results if the acquirer's country's characteristic is lower (higher or equal) than the target's. Column 3 reports results based on the mean difference between column 1 and column 2. Looking at the results we see that for both investor protection and recovery rate, if an acquiring bank is from a country that has a lower (higher) value compared to a target bank's country, the yield spreads are significantly negative (positive), with the mean difference in the effect between the two groups significant at conventional levels.<sup>18</sup> These results indicate that the bond market perceives that cross-border M&As in which the acquirer is from a country that has lower levels of investor protection and recovery rate as risk-reducing transactions. In contrast, if the acquiring bank is from a country that has a higher level of investor protection and recovery rate compared to the target bank's country the bond market perceive these types of cross-border M&As as risk-increasing events. These findings are consistent with the literature (see, e.g., LLSV (1997), (1998) and (2002)) that shows that with better protection of investors, outside

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<sup>18</sup> Results from other or alternative event windows are not elaborated here but they do represent striking similarities with the reported results and are available upon request.

investors (both bondholders and shareholders) are less concerned about expropriation risk and therefore require less compensation for risk. This is also the case for recovery rate (see, e.g., Acharya and Bharath (2004)).

For the moral hazard grouping, if the acquiring bank is from a country in which the moral hazard is greater compared to that of a target country, the effect is positive and significant while if the acquirer is from a country with moral hazard less than that of the target the yield spread is not affected. Thus, the effect is asymmetric. The former finding suggests that the bond market perceive these types of M&As as risk-taking transactions. As pointed out above, a greater level of moral hazard suggests that managers are more willing to undertake riskier projects, thus increasing the risk of bank insolvency.<sup>19</sup> Our findings are consistent with this view and indicate that bond holders require additional compensation for the potential excessive risk-taking by bank managers.

The results for the groupings based on the regulatory and supervisory environment of the banking sector significantly affects the abnormal changes in yield spreads. For the grouping based on the toughness measure there is a positive and significant effect irrespective of the relative supervisory toughness of the two countries. This finding provides support for the argument that one of the underlying reasons for cross-border bank M&As is the desire of managers to bypass their own governmental regulations and supervision. This therefore leads to an increase in the likelihood of bank insolvency due to the diseconomies of operating or monitoring an institution from a distance, resulting in an increase in the yield spread. The relative toughness of bank supervision apparently does not affect the abnormal effect on yield spreads differently between the two groups as shown in column 3.

The disclosure requirements grouping represented by the “transparency” variable shows a significantly different effect between the two groups. The results show that if an acquiring bank

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<sup>19</sup>Demirguc-Kunt and Detragiache (2002) find higher rates of banking crisis in countries with high moral hazard levels.

is from a country that has a higher level of transparency compared to that of the target, the abnormal effect on yield spreads is significantly positive, that the bondholders require additional compensation for information asymmetry associated with the looser disclosure requirement. If, however, an acquiring bank goes to a country having relatively stronger disclosure requirements, we do not find a significant effect on yield spreads.

Turning to the results of the creditor rights groupings, we see that while there is no abnormal effect if the acquirer is from a country with relatively lower creditor rights, if a target country's creditor rights is less than that of acquirer's, bond holders require significantly higher spreads (3.1 basis points). Regarding concentration of the banking system, we find that irrespective of the relative concentration of the acquirer's and target's banking system there is a positive and significant abnormal effect on yield spreads. This suggests that bond holders believe that concentration exacerbates rather than reduce the riskiness of banks. Interestingly though, we find that the impact is substantially larger if the acquiring bank's banking system is more concentrated. This result is in fact opposite to Hellman, Murdock, and Stiglitz (2001). Finally, contrast to Berger, DeYoung, and Udell (2001) and Buch and DeLong (2004), we find that bond holders do not perceive such information costs affecting the risk of banks. The results indicate that whether acquirers and targets share the same origin of law or language are in the same income level, there is a significant increase in yield spreads. At least in our sample data, therefore, information costs do not play a big role affecting the acquirer's risk.

Overall, the univariate tests on the effect of cross-border bank mergers and acquisitions on yield spreads of acquirers' bonds suggest that relative measures such as investor protection, moral hazard, recovery rate, creditor rights, and income between acquirers' country and targets' country significantly affect the bond holders' perceived risk.

#### *4.3. Equity returns and yield spreads: Is there wealth transfer?*

So far we have shown that on average cross-border M&As have a statistically and economically positive significant effect on acquirers' yield spread indicating that on average bondholders perceive these M&As as risk increasing. Here, we investigate whether there is also a change in acquirers' stock return and if this change is a wealth transfer from (to) bondholders.

To conduct the event study, we apply the standard event study methodology and make the standard assumption that security returns are driven by a single-index market model:

$$R_{jt} = \alpha + \beta_j R_{mjt} + \varepsilon_{jt}. \quad (2)$$

Where  $R_{jt}$  is the return on acquirer  $j$  on day  $t$ ,  $R_{mjt}$  is the market return of acquirer  $j$ 's country on day  $t$  and  $\varepsilon$  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 (2). Finally, the cumulative abnormal return is calculated ( $CAR_j$ ) for  $t = (-5, 0)$  where  $t=0$  is the announcement day. The cumulative average abnormal return ( $CAAR_j$ ) is calculated by averaging the CARs across the banks.

Table 4 presents the abnormal returns to bidders around the announcement of cross-border acquisition ( $t=0$ ). Panel A shows that the average CAR is positive but not significant across the various announcement windows. This result is significantly different than those reported by Amihud, Delong, and Saunders (2002) who find that acquirers average CAR is negative and significant. Panel B shows that, depending on the event window, the average value for the positive CARs ranges from 1.71 percent to 3.23 percent. On the other hand, the average for the negative CARs ranges from -1.49 percent to -2.98 percent. 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 significant levels is that in Panel A, the positive CARs are offset by the negative CARs, hence the statistical insignificance.

Panel C presents results when we separate the sample based on positive and negative AESP. Column 2 reports results for the positive AESP grouping. It indicates that for the  $t = (-$

5,0) window there is a positive and significant CAAR, suggesting that there is wealth transfer between bondholders and shareholders. For the negative grouping the results are even stronger. For the  $t=(0,+5)$  and  $t=(-5,+5)$  announcement windows, the CAAR is negative and significant. Interestingly we find that for this grouping the CAARs are more than twice the size of that reported for the positive group. Taken together these findings are consistent with the presence of wealth transfer between bondholders and shareholders, a finding that is different than that reported by Penas and Unal (2004) for domestic mergers.

In Panel D, we provide evidence on announcement abnormal returns when we separate the sample into groups based on country-specific characteristics. We see that when the acquirer is in a relatively lower institutional environment country compared to the target, the CAAR is generally positive (except for Creditor rights and Concentration) and statistically significant for Toughness and Transparency. On the other hand, when the acquirer is in a country with relatively higher institutional environment, the CAAR is negative for all measures and is statistically significant for Moral Hazard and Toughness.

The finding that CAARs are positive and significant for the positive AESP group and negative and significant for the negative AESP group suggests that in the former case there could be wealth transfer between bondholders and shareholders while for the latter case it suggests that wealth is not being redistributed between these two claimholders. To formally test the relationship between bondholder and shareholder gains, we estimate the following regression equation:

$$AESP_i = \alpha + \beta * CAR_i + \varepsilon_i. \quad (3)$$

Where  $AESP_i$  is the abnormal effect on bond yield spreads of acquirer  $i$  and  $CAR_i$  is the cumulative abnormal return on acquirer  $i$ .<sup>20</sup> In general, the increase in bank risk may induce a

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<sup>20</sup> We also calculate CARs based on Eckbo *et al.* (1990) and run the equation (3) to test the wealth transfer from shareholders to bond holders. However, we do not find any evidence of wealth transfer. For example, the coefficient of  $CAR$  is 2.3378 (t-stat is 0.52) for the event window with (-1week, +1week).

wealth transfer from bondholders (stockholders) to stockholders (bondholders).<sup>21</sup> If in fact a wealth transfer has occurred we would expect a significant coefficient for the variable  $CAR_i$  in Eq. (3).

Table 5 Panel A presents the results of tests of wealth transfer between bondholders and shareholders for the full sample and when the sample is separated by negative and positive CARs. The first column contains the coefficients of  $CARs$  results for the full sample based on various announcement windows. Irrespective of the announcement period there is no evidence of wealth transfer between these two claimholders. This is not surprising given that we did not find significant abnormal stock returns for the full sample. The results in columns 2 and 3 are obtained when we separate the sample into M&As with positive and negative CARs and repeat the estimations. The results are qualitatively similar to those obtained for the full sample. Panel B of Table 5, contains tests of wealth transfer when we separate the sample by institutional characteristics of the bidder and target countries. We find that when the acquirer is from a country with a relatively lower institutional environment compared to the target the coefficient of  $CARs$  is in general positive (except for Recovery rate and Moral Hazard). However, the coefficients are not significant at any conventional level. In contrast, when the acquirer is in a country with a relatively higher institutional environment compared to the target, the coefficients are in general negative. However, once again, the coefficients are not statistically significant. These findings lead us to conclude that the increase in the yield spreads resulting from the M&As announcements do not result in wealth transfer from bond holders to shareholders.

In Panel C, we separate the sample by the sign of the abnormal effect on yield spreads to the bidder bank. Column 1 shows the results for the positive AESP group. Consistent with our earlier results we find a positive and significant coefficient. This finding indicates that there is a

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Other results are available upon request. Therefore, we use CARs obtained from the conventional event study methodology.

<sup>21</sup> Additionally, we run the regression  $CAR_i = \alpha + \beta * AESP_i + \varepsilon_i$  to test the wealth transfer from shareholders to bond holders. The results are very similar to the ones reported in Table 5 and therefore not reported. These results are available upon request from the authors.

wealth transfer from shareholders to bondholders. Interestingly this finding is different than that reported by Penas and Unal (2004) for domestic bank M&As. The results for the negative AESP is significantly different in that there is no evidence of wealth transfer between these two claimholders. This finding is somewhat surprising given that earlier we had found significant negative CARs for the negative AESP group. A possible explanation for this finding that the observed negative abnormal changes in the yield spread is not due to a wealth transfer from shareholders but from other stakeholders most notably, regulators. We turn to this issue next.

To further investigate the wealth transfer argument, we run several regressions to examine whether the regulator's guarantee play any role in cross-border bank M&As. The regulator's guarantee is proxied by the extensiveness of deposit insurance, the moral hazard index. In the regressions, we use a dummy variable for the relative moral hazard if the target country has more extensive coverage than the bidder country. We believe that this variable may be able to capture the presence of wealth transfer from the target country's regulators' (given their guarantee) to acquirer's bondholders.

Columns 2 and 4 of Panel C contain results when we regress the moral hazard variable individually, whereas in columns 3 and 6 we include the CARs. When the abnormal announcement effect on yield spreads is positive, we do not find the moral hazard variable significant. However, we find that when the abnormal effect on yield spreads is negative, the coefficient of the moral hazard dummy variable is positive and significant. This result suggests that there is a wealth transfer from regulators of the target country to bondholders of the acquiring bank. The results when both variables are included in the regressions are similar to those when they are entered separately. To our knowledge this is the first paper that documents that there is type of wealth transfer during cross-border M&As.

In sum we find evidence of wealth transfer between the various stakeholders. Importantly we find it not only between bondholders and shareholders but also between bondholders and



regulators. This latter finding is important in that future studies that examine cross border M&As need to take into account its impact of regulators on these transactions.

## 5. Multivariate Analysis

The univariate tests of the previous section suggest that variables such as investor protection, moral hazard, recovery rate, creditor rights, and income levels significantly affect yield spreads of acquiring banks. In this section, we present cross-sectional multivariate regression results. Results are based on estimates from the following regression equation:

$$AESP_i = \alpha + \beta_1 Investor_i + \beta_2 Recovery_i + \beta_3 Hazard_i + \beta_4 Tough_i + \beta_5 Trans_i + \beta_6 Concent_i + \sum \beta_j Z_i + \varepsilon_{jt}. \quad (4)$$

Where *AESP* is the measure of abnormal effects on yield spreads and is estimated directly as the parameter  $\beta_j$  from equation (1). We use a natural logarithm of one plus the parameter  $\beta_j$  since the parameter has a high degree of kurtosis. *AESP* is estimated based on several announcement windows as well as using different estimation windows (either  $t=(-30, -4)$  or  $t=(-52, -4)$ ).

*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 0. *Recovery* is a dummy variable and takes a value of 1 if a target's country has a better recovery rate than an acquirer's country otherwise it takes a value of 0. *Hazard* captures the relative moral hazard problem and is measured as the natural logarithm of the ratio of the target country's index over the acquirer's index. *Tough* is a relative toughness index of bank supervision between target and acquirer countries. We use the ratio of the target country's index over the acquirer's country index. *Trans* is a transparency measure and we use the ratio of a target's country index over an acquirer's country index. We also include 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 0.

The variable  $Z$  is a vector of control variables. We include creditor rights (*Creditor*), measured as the ratio of a target country's creditor rights over an acquirer's index. A higher value of *Creditor* indicates stronger creditor rights in a target's country compared to an acquirer's country. We include a dummy variable, *Law*, which is equal to 1 if the acquirer and target countries have the same legal origin, 0 otherwise. We also include a dummy variable that takes a value of 1 if both countries have similar income levels, otherwise 0. We control 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 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 we include *D100CS*, a dummy variable that takes a value of 1 for M&As with 100 percent cash payments, otherwise 0. Finally, we control 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 over total assets of acquiring banks before the M&A. *LLRacq* is the prior year ratio of loan loss reserves over total loans of acquiring banks before the M&A.

Table 6 presents correlations among our variables. It shows a negative correlation between the abnormal effect on yield spreads and investor protection, and recovery rates. It shows a positive correlation with moral hazard and toughness of supervisors. In addition, investor protection is positively correlated with the recovery rate, moral hazard, and creditor rights. The table shows that although there is some correlation among the explanatory variables, it is not severe enough to make multicollinearity a problem.

Table 7 shows the regression results using  $t=(-30,-4)$  as the estimation period with the announcement week as the announcement window. In all regressions, we use the White's (1980) estimator for the covariance matrix. As expected, we find that 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 we find a significantly negative impact of investor protection on abnormal changes in yield spreads. The results for the recovery rate are dissimilar to those found in the univariate results. Specifically, we find that the coefficient of recovery rate is not statistically significant, and that this result holds across the various model specifications.

The difference in the level of moral hazard between the banking industries of the two countries also significantly impacts the abnormal effects of the yield spreads significantly. Table 7 shows that if the moral hazard in the banking industry in the target's country is higher than that of the acquirer's country, then there is a positive relationship between moral hazard and *AESP*. This finding provides support for the notion that the greater the level of moral hazard the greater is the incentive of bank managers to take on more risky projects thereby taking advantage of the deposit insurance program.<sup>22</sup> Our regression results show that bondholders require additional compensation for the potential excessive risk taking activities in a target country by acquiring bank managers. The significant positive impact of moral hazard appears in every model specification.

Even though the extant literature contend that the regulatory and supervisory environment of a country's banking industry should have a significant impact on the risk level of banks following a merger or acquisition, we only find weak support for this argument and only in models 8 and 10. The results for creditor rights are similar to those obtained for the regulatory and supervisory environment. In particular only in models 8 and 10 do we find statistical significance. Surprisingly we find that the effect is positive. This is different from our a priori

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<sup>22</sup>Demirguc-Kunt and Detragiache (2002), suggest that this excessive risk taking by bank managers may result in greater bank insolvency, and show a higher rate of banking crises in countries that have a relatively high level of moral hazard in their banking industry.

expectations and is significantly different than the results reported in the univariate analysis. This positive effect is puzzling as theory suggests that the impact should be negative.

Hellman, Murdock, and Stiglitz (2001) suggest that as a banking industry becomes more concentrated, there is a decrease in bank risk due to the profit buffer. However, Mishkin (1999) suggests that the high concentration in banking sector may increase the risk of banks. He argues that with high degree of concentrations the few large banks will receive greater subsidies, thereby possibly intensifying their risk-taking activities and thus leading to higher insolvency risk. We find a positive impact of relative banking concentration on changes in yield spreads thus indicating that bond holders perceive banking concentration as a risk rather than a rent-taking opportunity.

Berger, DeYoung, 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 7 however shows that the origin of law does not affect changes in yield spreads in any meaningful way. The results show that acquirers and targets sharing the same origin of law do not affect bond holders' risk perception in cross-border bank M&As. The difference in income between the transacting countries is not found to be an important determinant of the announcement effect. Again, this is not consistent with the univariate findings where income difference mattered. Throughout the regression models, we also control for foreign exchange risk, *DFX*, but do not find any significant impact of the difference in currencies between the two parties.

Turning to the other variables, we find consistent with the existing literature, that method of payment in M&A transactions matters as we observe 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 such transaction is likely to reduce the liquidity of company and in turn increases the risk and is reflected in the higher yield spreads. Interestingly, we did not observe that bank-specific variables are 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. As an acquirer's bank has a higher level of bad loans before the cross-border M&A, bond holders require significantly higher yield spreads when the bank announces expansion of operations abroad.

To check the robustness of our findings we run the same regressions with different announcement windows as well as with different estimation windows. Table 8 shows the regression results using the estimation window from thirty weeks before to four weeks before the announcement with the announcement windows as one week prior to one week after the announcement day. The results are qualitatively similar to results from Table 7. However, we observe that the two week window provides more significant results especially for DFX where in all model specifications it is now statistically significant.

Overall, the multivariate tests suggest that in cross-border bank M&As the difference in investor protection as well as moral hazard between the target's country and the acquirer's country significantly affects the bond holders' perceived risk as measured by bond yield spreads. We also find that the more concentrated is the banking industry in the target's country, the greater is the increase in the announcement period yield spread effect. Also, if the method of payment in acquiring targets is totally cash, the larger is the announcement period effect. However, we do not find strong support for the argument that the announcement period effects should be significantly impacted by the regulatory and supervisory environment of the banking industry. In addition, the origin of law and differences in income levels do not affect yield spreads. The performance of the two-week announcement window models suggests that there may be some bond trading in anticipation of the announcement of the merger or acquisition.

## **6. Conclusion**

In recent years, there has been a significant increase in geographical diversification by banks via cross-border M&As (see, e.g., Focarelli and Pozzolo (2001)). One school of thought

is that cross-border M&As have the potential of reducing a bank's insolvency risk. Another is that they may in fact be risk increasing as they provide managers with the incentives to shift risk given the increase costs of monitoring associated with cross-border M&As. To date empirical evidence as to the impact of cross-border bank M&As on bank risk is extremely limited. This 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. In this paper we take steps to fill this gap by examining the effect of cross-border bank M&As on the yield spreads (riskiness) of acquiring banks. In our analysis we also present evidence on the relative importance of country-specific factors such as the level of investor protection, recovery rate, moral hazard, banking supervisions and regulation, creditor rights, and banking concentration rule of law, income levels, 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 we find that there is a significant positive abnormal effect to acquirers' yield spreads following the announcement of cross-border bank M&As indicating that bond holders of acquiring banks require higher yields to be compensated for perceived increases in bank risk due to cross-border deals. It thus provides support for the strand of literature that contends that cross-border bank M&As are risk increasing activities. Note that this finding is different from that reported by Penas and Unal (2004) for domestic bank M&As where they find that, on average, bond returns to acquirers are positive implying that these restructuring activities are risk-reducing. Additionally, unlike the evidence for domestic mergers increase in yield spreads cannot be attributed to wealth transfer from bond holders to shareholders.

We also observe several other interesting results. We find that differences in investor protection, recovery rates, and moral hazard 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&As announcements. Similarly, we find that changes in acquirers' yield spreads are also impacted by differences in transparency and creditor rights between the target and acquiring countries. Importantly we do not find that the supervisory and regulatory environments are important variables in explaining changes in acquirers yield spread following M&As announcements.

Our findings of the importance of moral hazard and investor protection have several important implications. When a bank acquires or merges with another financial institution in a country characterized by greater moral hazard, headquarters of the home bank should plan to monitor the bank's operations more closely, perhaps in coordination with the management in the host country. The regulators may judge that the acquiring bank should increase its reserves. Similarly, when the acquiring bank extends its operations to a country with lower investor protection, the home country regulator may require that the acquiring bank increase its reserves to better protect depositors, bond holders, and shareholders. Generally, these points suggest that regulators should consider relative situations in both the home and the host countries in judging the risk of a multinational financial institution and in setting the sufficiency of the banks' reserve positions.

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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
Western 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
AHazard	Acquirer Moral Hazard	4.94	1.44	0.00	7.00
THazard	Target Moral Hazard	4.81	1.54	0.00	7.00
Arecovery	Acquirer Recovery Rate	66.70	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	0.00	1.00
Law	Dummy Variable for the Same Origin of Law	0.37	0.48	0.00	1.00
Language	Dummy Variable for the Same Language	0.06	0.24	0.00	1.00
DFX	Dummy Variable for Same Currency	0.10	0.29	0	1
D100CS	Dummy Variable for 100% Cash Deal	0.52	0.50	0	1

Table 2. Overall announcement effects on yield spreads

The measure of announcement effects on bank yield spreads is estimated directly as the parameter  $\beta_j$  in equation (1). Abnormal effects are averaged with equal weights across banks to form average abnormal effects. The test statistics is based on the Z-test. SP304 is average abnormal effects based on the estimation window of 30 to 4 weeks before announcement day. SP524 is average abnormal effects based on the estimation window of 52 to 4 weeks before announcement day.

Panel A: Abnormal effects on yield spreads

Windows	SP304	SP524
(0,0)	0.0483*** (3.63)	0.0890*** (5.24)
(0,+1W)	0.0474*** (4.65)	0.0881*** (7.12)
(-1W,0)	0.0414*** (3.46)	0.0821*** (6.35)
(-1W,+1W)	0.0431*** (4.49)	0.0838*** (7.95)
(-2W,0)	0.0409*** (4.05)	0.0815*** (7.43)
(-2W,+1W)	0.0423*** (4.91)	0.0829*** (8.79)

Panel B: Abnormal effects on yield spreads (positive group vs. negative group)

Windows	Positive SP304	Negative SP304	Positive SP524	Negative SP524
(0,0)	0.1813*** (12.50)	-0.1330*** (-8.88)	0.2024*** (11.33)	-0.1134*** (-6.95)
(0,+1W)	0.1838*** (17.67)	-0.1364*** (-13.29)	0.2051*** (16.17)	-0.1170*** (-10.09)
(-1W,0)	0.1604*** (10.81)	-0.1190*** (-7.89)	0.2015*** (10.80)	-0.1194*** (-6.09)
(-1W,+1W)	0.1679*** (10.03)	-0.1248*** (-6.37)	0.1982*** (10.24)	-0.1144*** (-5.65)
(-2W,0)	0.1556*** (9.69)	-0.1147*** (-6.53)	0.1931*** (10.16)	-0.1116*** (-5.67)
(-2W,+1W)	0.1517*** (8.88)	-0.1094*** (-5.79)	0.1934*** (9.98)	-0.1105*** (-5.69)

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

Table 3. Announcement effects on bond yield spreads by country characteristics

The measure of announcement effects on bank yield spreads is estimated directly as the parameter  $\beta_j$  in equation (1) and is based on the estimation window of 30 to 4 weeks before announcement day. Abnormal effects are averaged with equal weights across banks to form average abnormal effects. The test statistics is based on the Z-test. The event window is based on -1 week to +1 week (-1W,+1W). Acquirer lower means the indicated institutional environment in the acquirer's country is lower than that of target country. Acquirer higher means the indicated institutional environment in the acquirer's country is higher than that of target country. Investor protection is a variable measuring investor legal protection of country and is taken from Djankov *et al.* (2005). Recovery rate measures how many cents on the dollar claimants recover from an insolvent firm and is developed by Djankov *et al.* (2005). Moral hazard measures the extensiveness of deposit insurance program of country and the index is developed by Demirguc-Kunt and Detragiache (2002). The variables are from World Bank database (2004). Toughness is index that measures toughness of banking supervisors and is from Buch and DeLong (2004). Transparency is the index of extensiveness of disclosure requirements in the banking industry is adapted from Buch and DeLong (2004). The creditor rights index is developed by La Porta *et al.* (1998) and further elaborated in Djankov *et al.* (2004). This index measures the rights of secured lenders that are defined in laws and regulations of country; a higher value indicates stronger creditor rights or stronger protection against borrower expropriation. Concentration measures a country's banking sector concentration obtained from the World Bank Database (2004) and is an index based on the fraction of assets in the five largest banks owned by commercial banks and/or financial conglomerates.

Panel A: Abnormal announcement effect on yield spreads

Institutional Variables	Acquirer Lower	Acquirer Higher	Mean Difference
Investor protection	-0.0163*** (-3.60)	0.0614*** (6.76)	-1.93* (0.06)
Recovery rate	-0.0260** (-2.44)	0.0758*** (6.86)	-2.08** (0.04)
Moral hazard	0.0522 (0.06)	0.0312*** (4.64)	0.53 (0.59)
Toughness	0.0410*** (2.69)	0.0415*** (3.40)	-0.01 (0.99)
Transparency	0.0187 (1.06)	0.0523*** (4.52)	-0.70 (0.49)
Concentration	0.0209*** (2.52)	0.0536*** (2.93)	-0.82 (0.41)
Creditor rights	0.0522 (-0.58)	0.0310*** (4.09)	0.36 (0.72)



Panel B: Abnormal announcement effect on yield spreads

Same means the indicated institutional environment in the acquirer's country is same as that of target country. Different means the indicated institutional environment in the acquirer's country is different from that of target country.

	Same	Different	Mean Difference
Income	0.0690*** (5.64)	0.0178 (0.61)	1.31 (0.19)
Origin of Law	0.0463** (2.25)	0.0301*** (3.84)	0.40 (0.69)
Language	0.0428*** (3.83)	0.0463*** (2.72)	-0.08 (0.94)

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

Table 4. Abnormal returns to bidders in cross-border bank M&As

The announcement abnormal return to shareholders is estimated by the market model. Abnormal returns are averaged with equal weights across banks to form average abnormal return. CAAR is cumulative average abnormal return to acquiring banks. AESP measures abnormal changes in yield spreads and is based on the estimation window of 30 to 4 weeks before the announcement day. The test statistics is based on the Z-test. (CAAR and CAR in %).

Panel A: Abnormal returns to bidders

Window (Day)	CAAR	Z-statistic	Max CAR	Min CAR
(-5,1)	0.01	0.07	11.79	-17.96
(-5,0)	0.19	0.45	12.87	-12.40
(-1,0)	0.20	1.08	11.41	-8.13
(-1,1)	0.02	0.39	10.33	-13.70
(-2,2)	0.01	0.05	10.89	-16.06
(-1,5)	-0.41	-0.56	12.52	-8.79

Panel B: Average CAR for bidders sorted by positive and negative CARs

Window (days)	Positive CAAR	Z-statistic	Number positive	Negative CAAR	Z-statistic	Number negative
(-5,1)	3.10***	6.48	69	-2.98***	-9.62	71
(-5,0)	3.23***	6.49	68	-2.68***	-8.98	72
(-1,0)	1.71***	6.34	74	-1.49***	-9.68	66
(-1,1)	1.91***	5.89	74	-2.09***	-9.90	66
(-2,2)	2.68***	5.54	71	-2.73***	-9.82	69
(-1,5)	2.85***	2.43	61	-2.93***	-7.23	79

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

Window (Day)	Positive <i>AESP</i> group CAAR	Z-statistic	Negative <i>AESP</i> group CAAR	Z-statistic
(-5,0)	0.27**	-2.14	0.01	-0.39
(-0,0)	-0.37	-0.42	-0.08	-0.89
(0,5)	-0.56	-1.13	-0.64**	-2.22
(-5,+5)	-0.34	-0.44	-0.62***	-4.17

Panel D: Cumulative average abnormal returns to bidders (subgroup)

Window (Day) t=(-5, +5)	Acquirer has lower <i>CAAR</i>	Z-statistic	Acquirer has higher <i>CAAR</i>	Z-statistic
Investor protection	0.23	0.14	-0.13	-1.57
Recovery rate	0.35	0.18	-0.80*	-1.72
Moral hazard	0.35	0.57	-1.58***	-3.97
Toughness	0.26**	-2.27	-1.23**	-2.24
Transparency	0.14***	-3.29	-0.33	-1.02
Concentration	-0.67***	-3.56	-0.15	-0.68
Creditor rights	-0.44	-0.06	-0.43	-1.43

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

Table 5. Regression results of abnormal change in yield spreads on CAR

Panel A: Overall regression of abnormal effect on yield spreads (*AESP*) on *CAR*

Abnormal effects on yield spreads are based on the estimation window of 30 to 4 weeks before the announcement day. *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 -5days to 0 day (-5,0), 0 day to +5 days, or -5 days to +5 days (-5,+5).

Dependent Variable / ( <i>CAR</i> window)	Coefficient of <i>CAR</i>	Coefficient of <i>CAR</i> (positive <i>CARs</i> )	Coefficient of <i>CAR</i> (negative <i>CARs</i> )
<i>AESP10</i> / (-5,0)	0.3073 (0.61)	0.9823 (0.77)	0.7795 (0.88)
<i>AESP01</i> / (0,+5)	-0.1950 (-0.35)	-0.8955 (-1.01)	-0.1389 (-0.11)
<i>AESP11</i> / (-5,+5)	0.1329 (0.33)	-0.2481 (-0.24)	-0.2908 (-0.44)

Panel B: Subgroup regression of *AESP* ( $t=(-1W, +1W)$ ) on *CAR* ( $t=(-5,+5)$ )

	Coefficient of <i>CAR</i> , (acquirer has lower <i>CAR</i> )	Coefficient of <i>CAR</i> (acquirer has higher <i>CAR</i> )
Investor protection	0.9395 (1.28)	-0.0125 (-0.03)
Recovery rate	-0.2571 (-0.27)	0.4254 (0.98)
Moral hazard	-0.5901 (-0.97)	0.3301 (0.66)
Toughness	0.6009 (0.89)	-0.0435 (-0.08)
Transparency	0.8083 (0.83)	-0.0809 (-0.19)
Concentration	0.4725 (0.76)	-0.0734 (-0.14)
Creditor rights	0.1915 (0.12)	-0.0880 (-0.23)

Panel C: Regression of abnormal effect on yield spreads (*AESP*) on *CAR*

Abnormal effects on yield spreads are based on the estimation window of 30 to 4 weeks before the announcement day. *AESP10* is abnormal effects on yield spreads for the window of  $(-1W, 0)$  and *AESP11* is abnormal effects on yield spreads for the window of  $(-1W, +1W)$ . The event window for *CAR* is -5 days to 0 days  $(-5,0)$  or -5 days to +5 days  $(-5,+5)$ .

	Positive <i>AESP10</i> 1	Positive <i>AESP10</i> 2	Positive <i>AESP10</i> 3	Negative <i>AESP10</i> 4	Negative <i>AESP10</i> 5	Negative <i>AESP10</i> 6
<i>CAR</i>	1.0395* (1.86)		1.1864** (2.23)	-0.6390 (-1.19)		-0.6998 (-1.34)
Moral Hazard		-0.0387 (-0.80)	-0.0319 (-0.67)		0.1015** (2.18)	0.1046** (2.26)
Constant	0.1528*** (7.62)	0.1512*** (6.67)	0.0223*** (6.52)	-0.1379*** (-5.93)	-0.1803*** (-5.98)	-0.1810*** (-6.05)
Adjusted R <sup>2</sup>	0.0289	0.0003	0.0454	0.0074	0.0648	0.0785
F-statistic	3.47*	0.64	2.83**	1.41	4.74**	3.30**
Number of Obs.	84	78	78	56	55	55

We also ran the regressions using the  $(-5, +5)$  window and the results were qualitatively similar.

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

Table 6. Correlation coefficients among the variables

The sample includes 147 cross-border bank M&As that announced and completed between 1995 and 2002. *AESP* is the measure of announcement-week abnormal effects on yield spreads. *Investor* is a dummy variable measuring relative investor legal protection of two countries and is taken from Djankov *et al.* (2005). It takes a value of one if a target country has better investor protection than an acquirer country. *Recovery* is a dummy variable and takes a value of one if a target country has better recovery rate than an acquirer country. It measures the relative recovery rate of two countries and is developed by Djankov *et al.* (2005). *Hazard* captures the moral hazard problems and the index is developed by Demircuc-Kunt and Detragiache (2002). It is the natural logarithm of the ratio of a target country's index over an acquirer's country index. *Tough* is a relative toughness index of bank supervisors between target and acquirer countries. *Trans* is a relative transparency between a target and acquirer countries and it is the ratio of a target country over an acquirer country. Both *Tough* and *Trans* is calculated based on World Bank database (2004). *Concent* is a dummy variable that take a value of one if a target country has a higher banking concentration than an acquirer country, otherwise it takes a zero. The index is from Barth *et al.* (2001). *Creditor* is the ratio of a target country's creditor rights over an acquirer's country index and 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 one if an acquirer and a target have the same legal origins, otherwise it is zero. 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 one for same income levels, otherwise it is zero.

	AESP	Investor	Recovery	Hazard	Creditor	Concent	Law	Income	Tough
Investor	-0.1511*								
Recovery	-0.1772**	0.2721***							
Hazard	0.1448*	0.3334***	-0.0263						
Creditor	0.0863	0.0848	0.1897	-0.1394					
Concent	-0.0963	0.0501	0.2868***	-0.2750***	-0.2643***				
Law	-0.0209	0.0290	-0.1396	-0.0873	0.0682	-0.2599***			
Income	-0.1030	0.5164***	0.1851**	0.0704	0.2783***	-0.0155	0.3070***		
Tough	0.0992	0.1366	0.0204	0.3680***	-0.1817**	-0.2022**	-0.0593	-0.0791	
Trans	-0.0970	0.0311	0.0415	-0.1141	0.2543***	0.0794	0.0368	0.1091	0.0373

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

Table 7. Regression of announcement week abnormal effects on yield spreads

The sample includes 147 cross-border bank M&As that announced and completed between 1995 and 2002. The dependent variable is *AESP* and is the measure of announcement-week abnormal effects on yield spreads and is estimated directly as the parameter  $\beta_j$  in equation (1), based on the -30 to -4 weeks estimation windows. We use the natural logarithm of one plus the parameter  $\beta_j$ . *Investor* is a dummy variable measuring relative investor legal protection of two countries and is taken from Djankov *et al.* (2005). It takes a value of one if a target country has better investor protection than an acquirer country. *Recovery* is a dummy variable and takes a value of one if a target country has better recovery rate than an acquirer country. It measures the relative recovery rate of two countries and is developed by Djankov *et al.* (2005). *Hazard* captures the moral hazard problems and the index is developed by Demirguc-Kunt and Detragiache (2002). It is the natural logarithm of the ratio of a target country's index over an acquirer's country index. *Tough* is a relative toughness index of bank supervisors between target and acquirer countries. *Trans* is a relative transparency between a target and acquirer countries and it is the ratio of a target country over an acquirer country. Both *Tough* and *Trans* are calculated based on World Bank database (2004). *Concent* is a dummy variable that take a value of one if a target country has a higher banking concentration than an acquirer country, otherwise it takes a zero. The index is from Barth *et al.* (2001). *Creditor* is the ratio of a target country's creditor rights over an acquirer's country index and 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 one if an acquirer and a target have the same legal origins, otherwise it is zero. 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 one for same income levels, otherwise it is zero. *DFX* is a dummy variable that takes a value of one for same currency, otherwise it is zero. *D100CS* is a dummy variable that takes a value of one for 100 percent cash payments, otherwise it is zero. *LogTAacq* is the natural logarithm of previous year of total assets of acquirer bank before the M&A. *ROEacq* is the previous year return on equity of the acquirer bank before the M&A. *TETAacq* is the previous year ratio of total equity to total assets of the acquirer bank before the M&A. *LLRacq* is the previous year ratio of loan loss reserves over total loans of acquirer 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	0.1468 (0.48)	-0.2946 (-0.95)	0.1611 (0.45)	0.0983 (0.27)	-0.0553 (-0.15)	-0.5267 (-1.34)	0.0015 (0.01)	-0.6557 (-1.61)	-0.3864 (-0.15)	-0.7083* (-1.70)
Investor	-0.0902** (-2.02)	-0.1121* (-1.89)	-0.0944** (-2.06)	-0.0987** (-2.12)	-0.1285*** (-2.65)	-0.1905** (-2.64)	-0.1344** (-2.62)	-0.2021*** (-2.96)	-0.1712** (-2.02)	-0.2421*** (-3.14)
Recovery	-0.0256 (-0.61)	0.0027 (0.06)	-0.0176 (-0.42)	-0.0320 (-0.75)	-0.0437 (-0.87)		-0.0394 (-0.82)		-0.0132 (-0.27)	-0.0414 (-0.75)
Hazard	0.1380*** (2.87)	0.1209** (2.20)	0.1151* (1.88)	0.1110* (1.87)	0.1609*** (2.84)	0.1587** (2.64)	0.1385*** (2.24)	0.1355** (2.12)	0.0983* (1.65)	0.1244** (2.06)
Tough			0.0144 (0.73)	0.0160 (0.81)			0.0304 (1.47)	0.0471* (1.83)	0.0316 (1.11)	0.0661** (2.27)
Trans			-0.0110 (-0.25)	-0.0102 (-0.23)			-0.0330 (-0.74)		-0.0167 (-0.36)	-0.0440 (-0.88)

Creditor					0.0450	0.0572	0.0726	0.0947*		0.0968*
					(1.06)	(1.27)	(1.51)	(1.90)		(1.86)
Concent					0.0377	0.0592	0.0742	0.1087*		0.1146*
					(0.71)	(1.03)	(1.41)	(1.87)		(1.76)
DFX		0.0686	0.0698		0.0517	0.0687	0.0811		0.0599	0.0884
		(1.38)	(1.39)		(1.09)	(1.08)	(1.41)		(0.98)	(1.24)
D100CS	0.0966**	0.0736**	0.0748**		0.0668*	0.0951**	0.0676*	0.1003**	0.1138**	0.1125**
	(2.51)	(2.07)	(2.06)		(1.89)	(2.54)	(1.95)	(2.61)	(2.57)	(2.76)
Law						-0.0197		0.0021	-0.0439	-0.0310
						(-0.40)		(0.05)	(-0.90)	(-0.66)
Income						0.0307			0.0867	0.0778
						(0.58)			(1.34)	(1.41)
LogTAacq	-0.0058	0.0114	-0.0098	-0.0051	0.0015	0.0193	-0.0058	0.0177	0.0115	0.0196
	(-0.36)	(0.72)	(-0.55)	(-0.28)	(0.08)	(1.00)	(-0.31)	(0.89)	(0.70)	(0.98)
ROEacq				-0.2053	-0.2039				-0.0695	-0.1090
				(-1.16)	(-1.15)				(-0.39)	(-0.55)
TETAacq		0.0246		0.0084	0.0302	0.0424		0.0633	0.0297	0.0689
		(0.37)		(0.13)	(0.46)	(0.67)		(0.74)	(0.43)	(0.73)
LLRacq		1.2624				1.4775		2.3695	2.8372	3.4857*
		(0.90)				(0.88)		(1.53)	(1.51)	(1.93)
Adjusted R <sup>2</sup>	0.0582	0.0637	0.0658	0.0654	0.0788	0.0954	0.0888	0.1339	0.0420	0.1243
F-statistic	2.84**	1.84*	2.05**	1.83*	1.99**	1.93**	2.14**	2.36**	1.33	1.92**
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.

Table 8. Regression of announcement week (-1W, +1W) abnormal effect on yield spreads

The sample includes 147 cross-border bank M&As that announced and completed between 1995 and 2002. The dependent variable is *AESP* and is the measure of announcement (-1, +1) week abnormal effects on yield spreads and is estimated directly as the parameter  $\beta_j$  in equation (1), based on the -30 to -4 weeks estimation windows. We use the natural logarithm of one plus the parameter  $\beta_j$ . *Investor* is a dummy variable measuring relative investor legal protection of two countries and is taken from Djankov *et al.* (2005). It takes a value of one if a target country has better investor protection than an acquirer country. *Recovery* is a dummy variable and takes a value of one if a target country has better recovery rate than an acquirer country. It measures the relative recovery rate of two countries and is developed by Djankov *et al.* (2005). *Hazard* captures the moral hazard problems and the index is developed by Demirguc-Kunt and Detragiache (2002). It is the natural logarithm of the ratio of a target country's index over an acquirer's country index. *Tough* is a relative toughness index of bank supervisors between target and acquirer countries. *Trans* is a relative transparency between a target and acquirer countries and it is the ratio of a target country over an acquirer country. Both *Tough* and *Trans* are calculated based on World Bank database (2004). *Concent* is a dummy variable that take a value of one if a target country has a higher banking concentration than an acquirer country, otherwise it takes a zero. The index is from Barth *et al.* (2001). *Creditor* is the ratio of a target country's creditor rights over an acquirer's country index and 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 one if an acquirer and a target have the same legal origins, otherwise it is zero. 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 one for same income levels, otherwise it is zero. *DFX* is a dummy variable that takes a value of one for same currency, otherwise it is zero. *DI00CS* is a dummy variable that takes a value of one for 100 percent cash payments, otherwise it is zero. *LogTAacq* is the natural logarithm of previous year of total assets of acquirer bank before the M&A. *ROEacq* is the previous year return on equity of the acquirer bank before the M&A. *TETAacq* is the previous year ratio of total equity to total assets of the acquirer bank before the M&A. *LLRacq* is the previous year ratio of loan loss reserves over total loans of acquirer 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	0.2366 (0.79)	-0.0674 (-0.23)	0.2767 (0.79)	0.2190 (0.61)	0.0502 (0.14)	-0.2909 (-0.88)	0.1025 (0.27)	-0.4240 (-1.29)	-0.0593 (-0.20)	-0.4240 (-1.32)
Investor	-0.0939** (-2.00)	(-0.1361** (-2.24)	-0.0947* (-1.94)	-0.0998** (-1.99)	-0.1355*** (-2.69)	-0.2198*** (-3.39)	-0.1400*** (-2.66)	-0.2340*** (-3.86)	-0.1978** (-2.39)	-0.2788*** (-4.35)
Recovery	-0.0302 (-0.70)	0.0140 (0.29)	-0.0180 (-0.42)	-0.0314 (-0.70)	-0.0465 (-0.93)		-0.0429 (-0.90)		0.0021 (0.04)	-0.0285 (-0.56)
Hazard	0.1462*** (3.08)	0.1402*** (2.80)	0.1247** (2.04)	0.1224** (2.04)	0.1732*** (3.16)	0.1805*** (3.34)	0.1519** (2.47)	0.1568** (2.64)	0.1178** (2.02)	0.1471** (2.52)
Tough			0.0095 (0.43)	0.0111 (0.51)			0.0279 (1.23)	0.0476* (1.79)	0.0282 (0.92)	0.0670** (2.33)
Trans			-0.0057 (-0.14)	-0.0057 (-0.14)			-0.0299 (-0.76)		-0.0395 (-1.01)	-0.0700* (-1.81)

Creditor					0.0531	0.0668*	0.0787*	0.1033**		0.1083*
					(1.50)	(1.79)	(1.96)	(2.61)		(2.62)
Concent					0.0551	0.0739	0.0894*	0.1225**		0.1290**
					(1.07)	(1.33)	(1.76)	(2.33)		(2.10)
DFX		0.1222**	0.1257**	0.1114**	0.1382**	0.1370***			0.1355**	0.1670***
		(2.50)	2.51	2.64	2.58	2.98			2.45	3.10
D100CS	0.1007**	0.0714*	0.0731*	0.0644*	0.0990**	0.0646*	0.1048**	0.1253***	0.1236***	
	(2.55)	(1.91)	(1.94)	(1.75)	(2.63)	(1.77)	(2.60)	(2.82)	(2.98)	
Law					-0.0348		-0.0148	-0.0644	-0.0497	
					(-0.70)		(-0.32)	(-1.35)	(-1.05)	
Income					0.0266			0.0817	0.0722	
					(0.52)			(1.36)	(1.40)	
LogTAacq	-0.0104	-0.0027	-0.0160	-0.0117	-0.0052	0.0044	-0.0119	0.0030	-0.0075	0.0017
	(-0.66)	(-0.18)	(-0.91)	(-0.64)	(-0.29)	(0.27)	(-0.66)	(0.18)	(-0.50)	(0.11)
ROEacq				-0.1740	-0.1715			0.0660	0.0230	
				(-1.16)	(-1.11)			(0.47)	(0.15)	
TETAacq		-0.0013		-0.0107	0.0152	0.0222		0.0429	0.0056	0.0497
		(-0.02)		(-0.14)	(0.20)	(0.38)		(0.56)	(0.09)	(0.60)
LLRacq		2.6474*				2.9025		3.8478**	4.6664**	5.3955*
		(1.68)				(1.62)		(2.29)	(2.49)	(3.05)
Adjusted R <sup>2</sup>	0.0689	0.1179	0.0836	0.0802	0.1063	0.1756	0.1154	0.2142	0.1011	0.2104
F-statistic	3.20**	2.65**	2.35**	2.03**	2.38**	2.88***	2.52***	3.40***	1.85**	2.72***
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.



Appendix 1. Variable definitions

Variable	Definition
AESP	AESP and is the measure of announcement (-1, +1) week abnormal effects on yield spreads and is estimated directly as the parameter $\beta_j$ in equation (1), based on the -30 to -4 weeks estimation windows. We use the natural logarithm of one plus the parameter $\beta_j$ .
Investor	Investor is a dummy variable measuring relative investor legal protection of two countries and is taken from Djankov <i>et al.</i> (2005). It takes a value of one if a target country has better investor protection than an acquirer country.
Recovery	Recovery is a dummy variable and takes a value of one if a target country has better recovery rate than an acquirer country. It measures the relative recovery rate of two countries and is developed by Djankov <i>et al.</i> (2005).
Hazard	Hazard captures the moral hazard problems and the index is developed by Demirguc-Kunt and Detragiache (2002). It is the natural logarithm of the ratio of a target country's index over an acquirer's.
Tough, Trans	Tough is a relative toughness index of bank supervisors between target and acquirer countries. Trans is a relative transparency between a target and acquirer countries and it is the ratio of a target country over an acquirer country. Both Tough and Trans are calculated based on World Bank database (2004).
Concent	Concent is a dummy variable that take a value of one if a target country has a higher banking concentration than an acquirer country, otherwise it takes a zero. The index is from Barth <i>et al.</i> (2001).
Creditor	Creditor is the ratio of a target country's creditor rights over an acquirer's country index and the index is developed by La Porta <i>et al.</i> (1998) and further elaborated in Djankov <i>et al.</i> (2004).
Law	Law is a dummy variable that is equal to one if an acquirer and a target have the same legal origins, otherwise it is zero. A country's legal origin is taken from Djankov <i>et al.</i> (2004).
Income	Income is a dummy variable that takes a value of one for same income levels, otherwise it is zero.
DFX	DFX is a dummy variable that takes a value of one for same currency, otherwise it is zero.
D100CS	D100CS is a dummy variable that takes a value of one for 100 percent cash payments, otherwise it is zero.
LogTAacq	LogTAacq is the natural logarithm of previous year of total assets of acquirer bank before the M&A.
ROEacq	ROEacq is the previous year return on equity of the acquirer bank before the M&A.
TETAacq	TETAacq is the previous year ratio of total equity to total assets of the acquirer bank before the M&A.
LLRacq	LLRacq is the previous year ratio of loan loss reserves over total loans of acquirer bank before the M&A.

Appendix 2. Expectations from literature, expected sign, and findings

	<u>Expectations from Literature</u>	<u>Expected Sign</u> <i>Our Findings</i>
Moral Hazard	Demirguc-Kunt and Detragiache (2002), Higher moral hazard caused by more generous deposit insurance of target countries against acquirer countries may increase the risk of bank failure, resulted in a higher yield spread, <i>ceteris paribus</i> .	Positive (S) <i>Agrees with Literature</i>
Investor Protection	La Porta et al. (2002) Better protection of outside investors enables that firm's profits would be paid as dividends or interest. This is because with better legal investor protection the entrepreneur can not expropriate as much as he wants. Higher investor rights may thus interpreted as less risk to investor.	Negative (S) <i>Agrees with Literature</i>
Recovery Rate	Acharya and Bharath (2004) Higher recovery rate implies a higher probability of recovering its loan losses, and thus relatively lower risk. Therefore, if a bank takes over a financial institution in a country with a higher recovery rate, the risk of the acquiring bank should decrease, assuming all other things are equal.	Negative (NS) <i>Agrees with Literature, not significant</i>
Transparency	Berger et al. (2000), Focarelli and Fozzolo (2001). Disclosure to regulators & stakeholders creates a safer financial system. The stronger regulation and supervision of the target bank's country creates a safer bank, and thus reduces the risk of bank failure.	Negative (NS) <i>Agrees with Literature, not significant</i>
Toughness	Berger et al. (2000), Focarelli and Fozzolo (2001). Regulation and supervision and create a safer financial system. The stronger regulation and supervision of the target bank's country creates a safer bank, and thus reduces the risk of bank failure.	Positive (NS) <i>Disagrees with Literature, not significant</i>

\* S = significant and NS= not significant.