Cross-Border Mergers and Acquisitions and Default Risk

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Abstract

We examine the impact of cross-border mergers on acquirers' post-merger default risk using a sample of 375 US acquiring firms from 1997 to 2011. After controlling for cultural, institutional, geographic and managerial factors between the US and target firm countries, we find that on average, cross-border transactions decrease the level of default risk of the acquiring firms. Our results are consistent with the asymmetric information hypothesis that managers take advantage of the overvaluation and volatility of their stock prices. We also observe that the geographic distance and industrial relatedness play significant roles in affecting post-merger default risk but find limited evidence indicating the relevance of institutional environments and cultural factors on changes in default risk. We find that option compensation increases the risk-taking motives of managers in high risk firms. Another significant finding is that managers use cross-border mergers to manage the extant risk of their firms.

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1. Introduction

In recent decades, with the acceleration of global financial market integration, mergers and acquisitions (M&A), involving both domestic and cross-border, have been rising steadily. International transactions account for a significant portion of the total mergers and acquisition deals, reaching to 45% of total merger volume in 2007 (Erel et al., 2012). Moreover, in more advanced economies, cross-border mergers accounted for more than 80% of the total foreign direct investments (Goergen and Renneboog, 2004). Cross-border mergers and acquisitions involve much more complex issues when compared to domestic M&A transactions, including differences in political and economic environments, quality of accounting and information disclosures, cultural and corporate governance norms, and bilateral trade relationships between countries. A crucial issue, in this context, is whether cross-border deals result in an increase (or decrease) in default risk, post-merger. Therefore, in this paper, we examine the post-merger default risk of a sample of US cross-border acquirers.

One of the main reasons purported in the literature for a company undertaking a merger is the diversification of its operations that would lead to reduced cash flows variability and consequently reduced risk. Mergers and acquisitions indeed have impact on the risk profile of firms, and even the possibility of their bankruptcy. While most studies in the M&A literature use accounting or equity-based measures of risk, such as z-score or beta, two recent studies employ direct measures of risk, namely the default risk. More specifically, Vallascas and Hagendorff (2011) use Merton's distance to default model, which combines both accounting and market data, and Furfine and Rosen (2011) who use the Expected Default Frequency which is developed by MoodysKMV, a commercial data service company. Vallascas and Hagendorff (2011) investigate the impact of European bank mergers on bidders' default risk. On average, for a sample of 143 acquiring banks, they find no material impact of bank mergers and acquisitions on the level of default risk. However, Furfine and Rosen (2011), using a large sample of more than 3600 firms, document

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domestic mergers in the US, on average, increase default risk of the acquiring firms. The observed positive relationship between mergers and the default risk of acquiring firms is in direct contrast to the traditionally held conjecture that mergers and acquisitions, through diversification effect, could lead to a reduction of risk for the combined firms, e.g., Amihud and Lev (1981). Furfine and Rosen (2011) test various hypotheses and contend that their findings are in line with asymmetric information hypothesis, i.e., managers of acquiring firms are able to hide risk-increasing takeovers from outside shareholders; they further find support for the notion that private benefits by managers, due to an increase in the option-based portion of their post takeover compensation, lead to higher risk taking by managers of acquiring firms in the US.

While the literature examining various aspects of domestic M&A is ample, there are, by comparison, fewer studies that investigate international mergers and acquisitions. The majority of studies in the field of M&A deals with the effects of these transactions on stock returns and corporate valuation. Briefly, prior studies on cross-border mergers report that acquirers can achieve higher valuation by purchasing foreign targets in related industries (Dos Santos, Errunza and Miller, 2008) or by acquiring targets in emerging markets or countries that generally have weaker corporate governance regime (Moeller and Schlingemann, 2005, Bris and Cabolis, 2008 and Rossi and Volpin, 2004). The opportunity to create value via cross-border mergers can also arise from what is termed as "wealth effects". A stronger domestic currency or higher domestic stock market valuation, relative to foreign currencies or foreign stock markets, motivates firms to take on cross-border mergers as the price of foreign targets become less expensive (Erel et al., 2012, Froot and Stein, 1991). Alternatively, transitory valuation errors could also lead to international transactions; especially when the stock price of acquiring firms is overvalued. The stock misevaluation could encourage these firms to issue shares to acquire (undervalued) targets (Shleifer and Vishny, 2003, Rohdes-Kropf and Viswanathan, 2004).

Although post-merger default risk changes have been examined for domestic mergers, there is limited work on cross-border mergers of industrial firms. Default risk changes following cross-border mergers have been examined only in the banking sector. There is as yet no comprehensive study focussing on industrial firms. Thus, the objective of our study is to extend the above analysis to the case of cross-border mergers and acquisitions. While international mergers and acquisitions generally involve complex factors such as foreign political and economic considerations, different accounting and information disclosures regimes, and cultural and corporate governance issues, at the same time, they could offer multiple advantages such as cheaper raw materials and labour costs, enhanced production efficiencies, favorite tax treatments, or a combination of these reasons that are not available in the domestic markets. We could therefore expect a substantially different relationship between risk and international takeovers than that observed in the domestic case by Furfine and Rosen (2011).

We investigate the relationship of default risk, a direct measure of risk, and cross-border mergers for a sample of US firms acquiring foreign firms for the period of 1997 to 2012. We find that, in contrast to the results obtained by Furfine and Rosen (2011) for domestic mergers, cross-border mergers do indeed reduce the overall default risk of acquiring firms which are in line with the findings of Vallascas and Hagendorff (2011) for cross-border bank mergers and acquisitions. We find that geographic distance between the two countries and industry diversification affect default risk, and that national cultures play a negative, though marginal role, on default risk. We are further able to report that the determinants on the change in the acquirers' default risk are relatively different from those of domestic mergers reported by Furfine and Rosen (2011). For instance, we note that the CEO's compensation is insignificantly related to the change in default risk. However, consistent with Furfine and Rosen (2011), we document that idiosyncratic risk, a proxy for information asymmetry, is positively related to the default risk. Finally, we report that

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mergers financed with shares are negatively related to the default risk, albeit not statistically significant.

The rest of the paper is organized as follows. In the next section, we review the relevant literature and draw testable implications based on theoretical underpinnings. In section 3, we describe our data. In section 4, we discuss our methodology for measuring default risk and rationale for the selection of variables in our analysis. In section 5, we report and discuss our empirical findings and their implications. Our conclusions are offered in the final section.

2. Literature Review and Theoretical Underpinnings

The traditionally held view is that mergers result in risk reduction for the combined entity (Galai and Masulis, 1974; Amihud and Lev, 1981). This insight is valid when the bidder and target have roughly equally risky cash flows and asset diversification resulting in risk reduction. In reality the evidence is mixed. Furfine and Rosen (2011) find empirical evidence consistent with the view that domestic mergers result in an increase in post-merger default risk. In the context of bank M&A deals in the US, empirical evidence indicates that the post- merger default probability is lower due to portfolio diversification (Emmons et al., 2004), geographic diversification (Hughes et al., 1999), and activity diversification (Van Lelyveld and Knot, 2009). Vallascas and Hagendorff (2011) find that on average, cross-border European bank mergers are risk neutral. Mergers and acquisitions, especially those which involve cross-border deals, are complex transactions. A host of deal, acquirer, and institutional factors influence the post-merger default risk of the combined entity. We therefore survey the relevant literature and draw testable implications based on underlying theory.

We identify five major sources of post-merger default risk changes. First, there could be a transfer of risk from the target firm to the bidder (Furfine and Rosen, 2011; Vallascas and Hagendorff, 2011). Second, the risk transfer could occur due to the target belonging to an industry that is more

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risky than the bidder's industry (Furfine and Rosen, 2011; Maquieira et al., 2011). Third, managerial actions could result in a post-merger change in default risk. Extant research has uncovered at least four potential actions managers of acquiring firms could take that influence the post-merger risk of the combined entity. One of the actions managers could take is to increase the post-merger leverage of the combined firm (Ghosh and Jain, 2000; Morellec and Zhadanov, 2008). A second possibility is that option-based managerial compensation could potentially incentivize managers to take on more risk in the post-merger period (Hagendorff and Vallascas, 2011; Grinstein and Hribar, 2004). There is some evidence in the literature that the composition of managerial compensation package could influence takeover decisions (Cai and Vijh, 2007 and Harford and Li, 2007). Specifically, managers whose option-based remuneration is high have more incentive to engage in risk-increasing takeover activities. Furfine and Rosen (2011) find strong support for this notion and report that post-merger default risk increases proportionally to the share of acquiring managers' compensation derived from stock options. A third possibility is that managers could exploit potential information asymmetry resulting in increased risk-taking in the post-merger period (Moeller, 2007). In those transactions that the level of asymmetric information is high, managers are able to get away by undertaking value-destroying takeovers (Moeller et al. 2007). Furfine and Rosen (2011) find strong impact of idiosyncratic volatility on acquiring firms' default risk. Finally, they could exploit valuation errors when the stock is overvalued (Dong et al., 2006; Erel et al., 2012). Firms with overvalued stock prices are more prepared to undertake riskier acquisitions. Such overvaluation has shown to influence post-merger acquiring firms' returns (e.g., Dong et al., 2006, Shliefer and Vishny, 2003). A related issue to the misevaluation is the method of payment. Normally, managers would choose to pay for a takeover by equity if they believe that their stocks are overvalued. On the contrary, it is expected that mergers financed by cash, a signal of reduced agency costs, to be value-enhancing transactions (Myers and Majluf, 1984 and Travlos, 1987).

Fourth, deal characteristics such as the use of cash versus could potentially influence the post-merger risk thereby impacting default risk. In cash financed deals, leverage is typically higher than stock financed deals and since leverage is related to default risk, cash deals are expected to result in increased default risk.

Finally, there could be cross-border sources of risk arising from a) geographic distance, b) cultural differences and c) governance differences between the bidder and target countries. We consider geographic distance between the acquirer and target countries to have impact on cross-border activities. It is generally accepted that, holding other things equal, the closer the distance between the two countries, the more bilateral trade and financial transactions between the two countries. Uysal et al. (2008) investigate the impact of geographic proximity on the acquisition decisions of US public firms and find that returns to acquiring firms in local transactions are more than twice that in non-local transactions. The higher return to local acquiring firms cannot be explained by related industry transactions, and appears to be related to information advantages arising from the geographic proximity. Erel et al. (2012) also investigate the same issue in a cross-border context, and report a role for geographic distance in that the probability of acquiring a firm in a nearby country is much higher than that in a remote country. In the context of cross-border deals, we expect that the proximity of acquiring and target countries should have an impact on post-merger default risk.

Next, it has been shown that cultural norms do influence financial decision making of individuals, including cross-border takeovers. Frijns et al. (2013) show that there is a direct link between cultural norms and corporate takeover activities and that firms from high uncertainty avoiding countries engage less in cross border mergers. Similarly, Ahern et al. (2012) examine the role of national cultural values on the pattern of cross-border merger activity and the potential gains they create. They report a strong negative relationship between cultural distance and the volume of

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cross-border merger activity between two countries. Particularly, the greater is the cross-country difference between the values of trust, hierarchy and individualism, the smaller is the cross-border merger volume. Erel et al. (2012) however, report marginal impact of culture as a determinant of cross border mergers. Overall, these works are consistent with the view that higher level of cultural differences may impose costly frictions on firms leading to fewer mergers. In the context of cross-border mergers, we expect cultural variables such as uncertainty avoidance to have an impact on post-merger default risk.

Prior research also provide clear indication that the differences between bidders' and targets' corporate governance aspects, legal and institutional environments, and the level of financial market development where the two firms are located are important features that could affect post-merger performance (see, e.g., Rossi and Volpin, 2004, Martynova and Renneboog, 2008a,b, Burns et al., 2007, Bris and Cabolis, 2008 and Francis et al., 2008). The results based on the extant literature generally support the view that national corporate governance regulation has a significant impact on cross-border takeovers. In particular, firms from countries with weak corporate governance regulation are more likely to carry out take-over abroad rather than domestically. Firms located in the countries with strong corporate governance regime, especially in the form of high minority shareholder protection, are more likely to acquire firms abroad. Similarly, strong creditor protection in the home country has shown to have a positive effect on international takeover activities. In the context of post-merger default risk, we expect differences in institutional quality to have a bearing with a transfer of risk from low institutional quality countries to the acquirers.

We use these insights from prior work to motivate our empirical tests.

3. Data and Measurement

3.1. Data Sources

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We collect cross-border mergers data from Zephyr as well as Security Data Corporation (SDC) Mergers and Corporate Transaction databases. Following Furfine and Rosen (2011), we select only complete deals with minimum ownership of 90%, cash and shares acquisition and mergers in non-financial and non-utility industries for the period from 1997 to 2011. We obtain the announcement dates, types of payment and industry of acquirers and target firms. Firm financial data are obtained from Osiris database and stock return data are collected from Datastream. We use data from Osiris and Datastream to construct proxies for idiosyncratic risk (VOL), valuation errors (RUNM and M/B ratio), leverage (LEV) and market value (MKTVAL). We obtain data on country level governance and accounting standards including the revised antidirector index (ANTIDIR), country of origin (ORIGIN), time to collect bounced checks (CHECK), stock market development (STOCKMKTDEV), prospectus disclosure index (DISC), periodic filling index (DISCFIL) and enforcement index (ENFORCE) from Djankov, La Porta, Lopez De Silanes and Shleifer (2008). We acquire data on national culture (UAI) from Hofstede's website. Following Erel et al. (2012), we calculate the distance between capital cities of a country pair (GEO) from mapsofworld.com. After merging these samples and dropping the missing observations, we winsorise all the independent variables at the 1% and 99% level of their values to mitigate the effects of outliers. Our final sample consists of 375 firm year observations.

3.2. Summary Statistics

Table 1 shows the overview of the cross-border merger sample by the year and geographic distribution. From Panel A, it can be observed that the total deal value has increased drastically over the sample period, from US$ 3,779 million in 1997 to more than US$ 27,687 million in 2011, with some variations in between. The average deal value per year shows less variation, with 1999 being an exception which is a result of one major transaction by Wal-Mart Stores Inc.. In Panel B, we can observe the geographical distribution of mergers deals over the sample period. Generally

speaking, the number of mergers increases continuously over years from 1997 to 2011, with a slight drop in 2008 which could be due to the effects of the global financial crisis. The majority of overseas target companies, 107 transactions, just under 30 percent of the target firms, are located in the UK, followed by 60 target firms in Canada.

Please insert table 1 here

4.0 Methodology

4.1. Default Risk

There are various measures of default risk based on academic and commercial models. There is evidence that using different measures would lead to different results when investigating the impact of the default risk on returns. Many of commercially provided measures have recently come under criticism for not being able to predict the default risk of firms during the recent financial crisis. In a recent paper, Chen and Hill (2013) compare various measures of default risk from both academic as well as those provided by the leading credit-rating agencies such as Standard and Poor and Moody's. While the authors find the average correlation among these measures to be about less than 50%, they report that the relationship between default risk and stock returns appears to provide consistent results. They conclude that there is no evidence that differences in the conclusions of existing empirical studies on the relationship between stock returns and default risk can be attributed to the different models of default risk used. In this paper, due to rather exuberant costs of credit-rating agencies charging for their default risk measures, we rely on a traditional academic model of the distance to default, namely the original model of Merton (1974) and its extension.

Moreover, using the naïve version of the Merton (1974) Distance to Default (henceforth DD) model, Bharath and Shumway (2008) report that their DD model is superior to hazard models and

in out of sample forecasts than the other existing models. Thus, we follow Bharath and Shumway (2008) in measuring probability of default risk[1].

According to Merton (1974) bond pricing model, the market value of a firm's assets follows a Brownian motion:

$$dV = \mu V dt + \sigma_v V dW \tag{1}$$

where V is the firm's asset value, μ is the expected continuously compounded return on V, σv is the volatility of firm value and dW is a standard Wiener process. The market value of equity, E, is:

$$E = V \mathrm{N}(d_1) - e^{-rT} F \mathrm{N}(d_2) \tag{2}$$

where F is the face value of the firm's debt, r is the risk free rate and N is the cumulative density function of the standard normal distribution, d_1 is given by:

$$d_1 = \frac{\ln(V/F) + (r + 0.5\sigma_v^2)T}{\sigma_v \sqrt{T}} \tag{3}$$

where T is one year, and d_2 is $d_1 - \sigma_v \sqrt{T}$

The volatility of the firm and its equity:

$$\sigma_E = \left(\frac{V}{E}\right) \mathrm{N}(d_1) \sigma_v \tag{4}$$

The distance to default is calculated as:

$$DD = \frac{\ln(V/F) + (\mu - 0.5\sigma_v^2)T}{\sigma_v \sqrt{T}} \tag{5}$$

and the implied probability of default is:

$$\pi = \mathrm{N}(-DD) \tag{6}$$

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[1] See Bharath and Shumway (2008) for detailed explanation of their model.

Next, we measure F as total current liabilities plus one half of long term debt (Bharath and Shumway, 2008 and Vassalou and Xing, 2004). E is the market capital of the firm's equity. The volatility of each firm's debt is estimated as:

$$\sigma v = (E/(E+F)\sigma_E + F/(E+F)\sigma_D) \tag{7}$$

where σ_D is $0.05 + 0.25\sigma_E$ and σ_E is the annualized percent standard deviation of returns, estimated from thirteen months to one month prior to the merger announcement. Bharath and Shumway (2008) use the firm's stock return over the previous year (r_{it-1}) as the proxy for the expected return on the firm's assets (μ). Thus, the distance to default is estimated as:

$$DD = \frac{\ln[(E+F)/F] + (r_{it-1} - 0.5\sigma_v^2)T}{\sigma_v \sqrt{T}} \tag{8}$$

and that the probability of default is:

$$\pi = N(-DD) \tag{9}$$

4.2. Description of Variables:

We use a number variables in our analysis based on the M&A literature, previewed in the prior section that could potentially have effects on the default risk. Firstly, we discuss a number of the firm level factors and deal characteristics including idiosyncratic risk, valuation errors, growth opportunities, firm size, types of payment and managerial compensation.

We measure idiosyncratic risk (VOL) as the standard deviation of the idiosyncratic component of the acquirer's stock returns estimated over the six month period ending one month prior to the merger announcement. This variable is a proxy for asymmetric information.

The next variable (RUNM) is related to valuation errors. This variable is measured as the buy and hold return of the acquirer's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the market index, S&P 500, returns over the same period.

To capture the impact of method of payment, we use a dummy variable (SHARES) for mergers financed at least partially with stocks. Furfine and Rosen (2011), however, are not able to find consistent relationships between default risk and misevaluation and the method of payment. They observe that for domestic US acquiring firms, stock acquisitions increase the risk level, but the risk increasing mergers are typically undertaken by poor performing acquiring firms.

Listing status of the target company is the next variable that is of interest. Unlisted target firms are expected to be more risky than listed firms. We test the risk-transfer effect by using the dummy variable PRIVATE to indicate a transaction where the target company is a private one.

The next variable (RELATED) is chosen to distinguish between the two different merger strategies, focused versus diversification. We use a dummy if the acquirer's industry is the same as the target firm's industry. Although studies such as Morck, Shleifer, and Vishny (1990) and Lang and Stulz (1994) report that diversification strategy generally diminishes acquiring firms' return, we believe that risk transfer could occur if targets are from riskier industries compared to acquirers. We would therefore expect that acquiring firms in related industries, a focus strategy, to involve less post-merger risk.

Firms' future growth is measured by Tobin's q and the market size (MKTVAL) is calculated as the natural logarithm of market capitalization. Mostly, it is expected that acquiring firms with better future growth, i.e., higher Tobin's q, to have better performance (Doukas, 1995), thus reducing the overall risk of merged companies. As for the size of the acquiring firms, it can be

argued that relatively larger firms have more agency issues, as their managers are further separated from their shareholders, allowing them to engage in transactions that benefit themselves rather than their shareholders by way of, for example, overpaying for targets (Roll, 1986 and Moeller et al., 2004) and hence increasing the risk facing merged firms.

Takeovers undertaken by firms with higher level of debt in their capital structure are more likely to involve higher default risk. We measure the level of leverage of acquiring firms, denoted by LEV, and investigate if firms with higher leverage face higher default risk.

We further investigate the role of compensation of managers of acquiring firm and its possible impact on the level of risk taking. We denote the option component of managerial compensation as OPTIONS and would expect that this variable to have a positive relation with the risk level in our analysis as well.

Vallascas and Hagendorff (2011) report that pre-merger default risk is related to changes in post-merger default risk. They find that firms with high (low) pre-merger default risk, leading to mergers having less (more) post-merger default risk. Thus, we include a dummy variable (HR) for those acquirers with high (above median) pre-merger default risk.

We next examine the factors that could have special bearing on determinants of cross-border mergers and acquisitions. These include geographic distance between the acquiring and target firms, cultural factors, the quality of accounting and information disclosure, corporate governance and bilateral trade relationship between two countries. We would thus expect that the proximity of acquiring and target countries, denoted as GEO, would facilitate acquisition of targets and result in lower post-merger default risk.

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We use the uncertainty avoidance score (UAI) from Hofstede (1980, 2001) as our proxy for national cultural value. This variable reflects the differences in how firms organize, operate and manage in different country origins (Kogut and Singh, 1988, provide details on construction of this variable).[2]

There are a wide range of variables that have been used as proxies for quality of corporate governance and stock market development. We control for country-level corporate governance mechanisms using a battery of variables, including the revised antidirector index (ANTIDIR), legal origin (ORIGIN), ownership concentration (OWN), stock market capitalization to GDP (STOCKMKTDEV) ratio, law enforcement index (ENFORCE), and accounting standards, such as the time to collect bounced checks (CHECK), prospectus disclosure index (DISC) and periodic filing index (DISCFIL).

We provide descriptive statistics of the sample in Table 2. We can observe that the majority of target companies are private companies. The median geographic distance between headquarters of US acquirers and targets is approximately 3,800 miles. The mean market value of the acquiring firms, US$ 18,209,133, is far larger than their median value, US$ 2,641,302, suggesting that the larger firms at the high end of distribution are more active in overseas takeovers. Most mergers are conducted through cash transactions and are in related industries. Targets countries typically have higher uncertainty avoidance scores. The fraction of CEO's compensation of the acquirers that is

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[2] Hofstede (2001) states that 'uncertainty avoiding cultures shun ambiguous situations. People in such cultures look for structure in their organizations, institutions and relationships, which makes events clearly interpretable and predictable'. He constructed the uncertainty avoidance score using three specific survey questions. These are:
1. How often do you feel nervous or tense (at work)? (1. Always to 5. Never).
2. How long do you think you will continue working for this company (or organization)? (1. Two year to 5. Until retirement).
3. Company rules should not be broken – even when the employee thinks it is in the company's best interest. (1. Strongly agree to 5. Strongly disagree).
These questions basically capture three features of uncertainty avoidance which are rule orientation, employment stability and stress. Responses from these questions are combined into one single measure of uncertainty avoidance.

derived from executive stock options is relatively low, on average (median) around 22% (14%) compared to that in domestic mergers (Furfine and Rosen, 2011). Targets countries are generally have higher antidirector index values than US, from similar legal origin as the US and typically it takes longer to collect bounced checks in target countries than the US. In general, the US has a better developed stock market and has higher disclosure indices than those of target countries.

Please insert Table 2 here

Our main model is based on the following regression model:

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\begin{aligned}
\Delta PHI_t = {} & \alpha + \beta RUNM_t + \beta VOL_t + \beta Q_t + \beta LEV_t + \beta SHARES_t + \beta LNGEO_t + \beta LNMKTVAL_t \\
& + \beta RELATED_t + \beta DUAI_t + \beta HR_t + \beta EXSAMPLE_t + \beta OPTIONS_t + \beta DANTIDIR_t + \\
& \beta DORIGIN_t + \beta DCHECK_t + \beta DSTOCKMKTDEV_t + \beta DDISC_t + \beta DDISCFIL_t + \\
& \beta DENFORCE_t + \text{Industry dummy} + \text{Year dummy} + \varepsilon_t
\end{aligned}
$$

where:

ΔPHI: is the change in the probability of default calculated before and after merger.

PRIVATE: is a dummy variable for private target companies.

RUNM: is the buy and hold return of an acquirer's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the market index (S&P 500) return over the same period.

VOL: is the standard deviation of the idiosyncratic component of the acquirer's stock return.

Q: is Tobin's q.

LEV: is leverage ratio.

SHARES: is a dummy variable is the merger is financed at least partially with stock.

LNGEO: is the natural logarithm of the distance between the acquirer's country and target's country.

LNMKTVAL: is the natural logarithm of the market value of the acquiring firm at the end of the month prior to merger announcement.

RELATED: is a dummy variable if the target's industry is the same as the acquirer's industry.

DUAI: is a dummy variable if the difference between the Uncertainty Avoidance Index which is a Hofstede's culture variable, of the acquirer's country is the same or greater than that of the target's country, else zero.

HR: is a dummy variable for observations with above median pre-merger default risk, else zero.

EXSAMPLE: is a dummy variable if we have information on an acquirer's compensation in our database in the announcement year.

OPTIONS: is the fraction of the CEO's compensation that is derived from executive stock options.

DANTIDIR: is the difference between antidirector index of the acquirer's country and that of the target's country.

DORIGIN: is the difference between the code for country origin of the acquirer's country and that of the target's country.

DCHECK: is the difference between the time to collect bounced checks in the acquirer's country and that of the target's country.

DSTOCKMKTDEV: is the difference between stock market development index of the acquirer's country and that of the target's country.

DDISC: is the difference between prospectus disclosure index of the acquirer's country and that of the target's country.

DDISCFIL: is the difference between disclosure in periodic filling index of the acquirer's country and that of the target's country.

DENFORCE: is the difference between public enforcement index of the acquirer's country and that of the target's country.

In our regression analysis, we include industry and year fixed effects.

5. Empirical Results

International mergers and acquisitions could provide various avenues for creating synergies and improved efficiencies for the firms. To what extent these transactions would lead to changes in the risk profile of the firms involved is the question we attempt to answer empirically in this section. Specifically, we are interested to examine the overall default risk consequences of the US acquiring firms as well as the impact of specific features of these deals on default risks. We first calculate the probability of default before and after the merger announcement and we obtain a value of -0.009. Thus, we find for our sample of acquiring firms in the period of 1997 to 2011 that on average their default risk decreases after cross-border mergers. This result is inconsistent with Furfine and Rosen (2011) but consistent with Vallascas and Hagendorff (2011).

5.1. Subsample Results

Next, we report in Table 3 the changes in default risk of our acquiring firms sample based on simple binary classification of several characteristics of firms, deals and countries in our sample.

Although there is no significant difference between the default risks of the samples of companies taking over listed and unlisted target companies, we observe a significant negative impact on default risk when the target company is a listed one. While the literature reports that takeover of private companies produces high valuation for acquiring companies (e.g., Conn et al., 2005), based on our univariate analysis, it appears that taking over an international listed company with readily available market data to be of less risk for the US acquiring firms. Thus there is weak evidence in support of a risk-transfer effect.

According to the finance and law literature, common law countries have the highest investor protections, better corporate governance, and more developed capital markets than those of non-common law countries (La Porta et al., 1997) and have better credit rating (Butler and Fauver, 2006) suggesting that firms in these countries are relatively easier to raise external financing. Fauver et al. (2003) however, report that cross border mergers involving developed countries have limited value than those of less developed markets. When we sort our sample based on these country characteristics, the results suggest that mergers involving target firms from common law and developed countries reduce acquirers' default risk. As the majority of our target firms were located in the UK, we also split the sample to those target companies based in the UK and the rest of the world. The results show statistically significant difference between the two sub samples. We observe firms taking over UK target firms generally reduce their overall default risk. Thus it appears that post-merger default risk is influenced by differences in institutional quality between acquiring and target countries.

Next, we observe that there is no significant difference between focused and diversified type of mergers. However, our results strongly indicate that when the US acquiring firms take over foreign target firms in related industries, they can significantly reduce their overall default risk. As for the method of payment, cash versus stock, there is again no difference between the two sub-samples but the payment of cash does reduce the default risk substantially for this subsample.

Of particular interest in this table is the variable PHI-1, the probability of default before the merger announcements. Vallascas and Hagendorff (2011) report that pre-merger default risk is related to changes in post-merger default risk. For our sample, it can be seen that for low pre-merger default risk acquirers, i.e., those below pre-merger median default risk, post-merger default risk increases significantly, while for pre-merger high risk acquirers, post-merger default risk significantly decreases. This finding is consistent with Vallascas and Hagendorff (2011) in the bank industry that high (low) pre-merger default risk acquirers do (not) benefit from the mergers.

As for the rest of variables tested, we do not find any statistical differences between the subsamples when divided based on misevaluation, information asymmetry, geographic distance, size of the acquiring firm, their growth opportunities or cultural factor. However, when we look at each subsample, we observe some significant and interesting results. It can be seen that firms with less misevaluation based on their past returns reduce their default risk. This result indicates that managers of such companies, with a proper valuation of their equity, involve in risk-reducing takeovers. The same is true for companies that face less information asymmetry, as proxied by volatility factor (VOL). Furthermore, companies that take over foreign operations that are closer to their home country, the US, reduce their overall default risk. Finally, the UAI factor, measuring the distance in the cultural values of the US and nations where the target companies are located, clearly is associated with lower post-merger default risk.

While these univariate results shed certain light on the relationship between default risk and certain characteristics of firms, deals, and countries in our sample, they suffer from potential confounding effects of other variables that are not controlled for. We overcome these issues by conducting our analysis using the multivariate regression model that was presented in the methodology section.

5.2. Full Sample Results

In order to move to our regression model, we need to check for multicollinearity among our variables. In Table 4, we report the correlation coefficients between key variables used in the study. Most correlation values, except for country-level governance variables, are small and do not pose any problem of multicollinearity. The strong correlations among country-level governance variables thus preclude us from using these variables simultaneously in our multiple regressions.

We generate our baseline results by regressing the change in default risk, ΔPHI (the change in distance to default probability before and after merger), on our independent variables capturing firm specific factors, culture, geographic distance and national institutional quality proxies. The results are provided in Table 5 and reveal some interesting findings.

We find empirical support for the impact of valuation errors on post-merger default risk. RUNM has a positive and statistical significant impact on default risk changes. Consistent with the misevaluation hypothesis, firms with poor (good) past stock performance are likely to undertake low (high) risky acquisitions. It appears that idiosyncratic risk (VOL) also has a positive and

statistical significant impact lending support to the view that managers exploit information asymmetry and this has a default risk increasing effect during the post-merger period. The positive and significant VOL coefficient is consistent with the notion that low (high) idiosyncratic risk, aka asymmetric information, result in mergers that decrease (increase) default risk. We find that deals in related industries (RELATED) significantly reduce post-merger default risk in the case of cross-border mergers. Geographic distance (LNGEO) also has a positive effect on post-merger default risk. Mergers financed by stocks (SHARES) are associated with lower default risk but the relation is not statistically significant. The difference in culture (DUAI) has limited impact on default risk, and firm size (LNMKTVAL) and institutional quality proxies do not seem to have any significant effect on post-merger default risk.

Acquirers with high pre-merger default risk (HR) undertake these mergers that reduce their default risk. It appears that managers use cross-border deals as a risk management device. When their extant risk is high, managers takeover low risk targets in other countries thereby reducing overall post-merger default risk. On the other hand, when the firm's extant risk is low, they seem to prefer high risk targets in cross-border takeovers. This evidence is consistent with Vallascas and Hagendorff (2011) in the context of cross-border European bank mergers.

Please insert Table 5 here

Furfine and Rosen (2011) report that those CEOs compensated mostly by options tend to undertake risk increasing domestic mergers. To examine if this motivation also plays a role in cross-border mergers, we include a dummy variable if we have information on an acquirer's compensation in our database in the announcement year (EXSAMPLE) and the fraction of options of total CEO's compensation (OPTIONS) as in their study. The results reported in Table 6 show that the signs on the coefficients of EXSAMPLE and OPTIONS are not statistically significant

suggesting that managerial compensation may not explain the change in default risk in cross-border mergers. The negative coefficient on HR suggests that managers of high risk firms generally try to reduce their firm risk by undertaking cross border mergers with low risk targets. However, the positive coefficient on HR*OPTIONS shows that when they are compensated with options, they are likely to increase their firms' risk by choosing risk-increasing mergers. Thus the impact of option-compensation on post-merger default risk is much more nuanced compared to the findings of Furfine and Rosen (2011) and Hagendorff and Vallascas (2011).

Please insert Table 6 here

In order to explore the impacts of country level institutional quality on post-merger default risk, we use dummy variables when targets are from emerging markets (EMERGING), UK or common law countries (COMLAW). Table 7 reports the results. None of the dummy variables are statistically significant suggesting that country origins do not have significant effects on changes in default risk. The signs and significance of the rest of the variables are similar to the previous results reported in Table 6.

Please insert Table 7 here

6. Conclusions

In this paper, we examine the impact of cross-border acquisitions on post-merger risk of a sample of US acquiring firms. Employing a direct measure of risk, namely the probability of default proposed by Bharath band Shumway (2008), we provide evidence that the overall default risk of firms in our sample is reduced after international takeovers. Our findings are in contrast to Furfine and Rosen (2011) who find domestic mergers in the US increase the overall default risk. When we

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unpack the impact of potential factors that are expected to have an influence on post-merger default risk, we find that valuation errors, information asymmetry, geographic distance and related industry all play a role. Our results indicate that stock overvaluation may give incentive to managers to undertake risk-increasing mergers. We also find that industry relatedness and geographic distance do play significant roles in affecting post-merger default risk. Finally, consistent with information asymmetry effects, and consistent with Furfine and Rosen (2011), we observe that idiosyncratic risk positively affects changes in default risk. In contrast to Furfine and Rosen (2011), we do not find a direct role for option compensation. We find that option compensation increases the risk-taking motives of managers in high risk firms. Another significant finding is that managers use cross-border mergers to manage the extant risk of their firms.

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Table 1

Overview of cross border merger sample

Panel A. Cross border merger distribution by year

Year	Number of mergers	%	Total Deal Value* (Mill US$)	%	Average Deal Value (Mill US$)
1997	6	1.60	3,779	2.52	630
1998	4	1.06	1,555	1.04	389
1999	3	0.80	10,690	7.14	3,563
2000	12	3.19	4,988	3.33	499
2001	7	1.86	295	0.20	59
2002	20	5.32	7,656	5.11	403
2003	23	6.12	15,355	10.25	808
2004	48	12.77	15,399	10.28	335
2005	40	10.64	5,865	3.92	163
2006	35	9.31	21,761	14.53	702
2007	35	9.31	12,408	8.29	388
2008	34	9.04	4,704	3.14	143
2009	28	7.45	4,715	3.15	168
2010	40	10.64	12,880	8.60	348
2011	41	10.90	27,687	18.49	692
Total	376	100.00	149,738	100.00	

Panel B. Geographic distribution of target firms

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Australia						1	1			1			1	2	1	7
Austria										1		1			1	3
Belgium			1	1				1		1				1	1	6
Brazil							3	2		1		1	1	2	2	12
Canada			1		1		3	6	3	5	12	6	5	7	11	60
Cayman Islands									1							1
Chile									1							1
China					1		1		1	1	1		2	1		8
Czech Republic				1												1
Denmark						1			1	1		2	1			6
Egypt								1								1
Finland													1		1	2
France				1		1	3	5	6	2	1	2	2	2	2	27
Germany		1		1	1	3	2	4	4	3	3	2	3	2	3	32
India						1										1
Ireland				1	1					1				2	2	7
Israel								1		1		1	2	1	1	7
Italy									2	2	2	1	1	3	1	12
Japan			1		1						1	1				4
Republic of Korea								1	2	1						4
Luxembourg														1		1
Malaysia													1			1
Mexico				1				3	1			2		1		8
Netherlands		1				1	1	3	1	2	4	3		3	2	21
New Zealand											1					1
Norway														2		2
Philippines											1					1
Poland						3									1	4
Portugal									1							1
Romania													2			2
Singapore													1			1
South Africa							1									1
Spain												2				2
Sweden						1				3		1	1		4	10
Switzerland							2	1	2	1	1	1		1		9
Taiwan									1							1
United Kingdom	6	2	2	4	3	7	6	20	13	8	7	8	5	9	7	107
TOTAL	6	4	3	12	7	20	23	48	40	35	34	34	28	40	41	375

*Missing deal value data are replaced with 0.

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Table 2

Descriptive statistics

	MEAN	SD	MIN	1Q	MEDIAN	3Q	MAX
PRIVATE	0.723	0.448	0.000	0.000	1.000	1.000	1.000
RUNM	0.010	0.082	-0.207	-0.041	0.006	0.057	0.259
VOL	0.019	0.009	0.007	0.012	0.017	0.023	0.054
GEO (Miles)	3,667	1,875	458	3,669	3,835	4,175	9,917
MKTVAL (US$ thousands)	18,209,133	47,559,564	43,825	792,787	2,641,302	9,727,396	277,060,300
Q	2.422	1.564	0.761	1.391	1.962	2.919	9.165
SHARES	0.085	0.280	0.000	0.000	0.000	0.000	1.000
LEV	0.655	0.862	0.000	0.169	0.435	0.780	5.312
RELATED	0.619	0.486	0.000	0.000	1.000	1.000	1.000
UAI	-7.691	20.117	-48.000	-24.000	-2.000	11.000	23.000
EXSAMPLE	0.808	0.394	0.000	1.000	1.000	1.000	1.000
OPTIONS	0.213	0.246	-0.060	0.000	0.135	0.357	1.321
HR	0.499	0.501	0.000	0.000	0.000	1.000	1.000
DANTIDIR	-0.952	1.002	-2.000	-2.000	-1.000	-0.500	2.000
DORIGIN	0.483	0.500	0.000	0.000	0.000	1.000	1.000
DCHECK	-1.118	0.700	-2.594	-1.710	-1.048	-0.626	0.325
DSTOCKMKTDEV	35.534	51.012	-106.818	-15.560	35.960	87.448	125.746
DDISC	0.321	0.233	0.080	0.170	0.250	0.500	1.000
DDISCFIL	0.212	0.271	0.000	0.000	0.000	0.400	0.800
DENFORCE	-0.458	0.445	-1.000	-1.000	-0.500	0.000	0.000

PRIVATE is a dummy variable for private target companies. RUNM is the buy and hold return of an acquirer's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the market index (S&P 500) return over the same period. VOL is the standard deviation of the idiosyncratic component of the acquirer's stock return. GEO is the distance between the acquirer's country and target's country. MKTVAL is the market value of the acquiring firm in the merger announcement year. Q is Tobin's q ratio. SHARES is a dummy variable is the merger is financed at least partially with stock. LEV is leverage ratio. RELATED is a dummy variable if the target's industry is the same as the acquirer's industry. UAI is the difference between the Uncertainty Avoidance Index of the acquirer's country and that of the target's country. EXSAMPLE is a dummy variable if we have information on an acquirer's compensation in our database in the announcement year. OPTIONS is the fraction of the CEO's compensation that is derived from executive stock options. HR is a dummy variable for observations with above median pre-merger probability of default risk. DANTIDIR is the difference between antidirector index of the acquirer's country and that of the target's country. DORIGIN is the difference between the code for country origin of the acquirer's country and that of the target's country. DCHECK is the difference between the time to collect bounced checks in the acquirer's country and that of the target's country. DSTOCKMKTDEV is the difference between stock market development index of the acquirer's and that of the target's country. DDISC is the difference between prospectus disclosure index of the acquirer's country and that of the target's country. DDISCFIL is the difference between disclosure in periodic filling index of the acquirer's country and that of the target's country. DENFORCE is the difference between public enforcement index of the acquirer's country and that of the target's country.

Table 3

Changes in probability of default sorted based on subsamples

	Number of Observations	ΔPHI	*t*-stat mean	*t*-stat Mean Difference
Type of target				
Private	271	-0.005	0.68	0.61
Public	104	-0.010**	2.09	
Non UK	268	-0.004	0.78	2.06
UK	107	-0.021***[a]	3.21	
Non common law country	181	-0.005	0.75	1.02
Common law country	194	-0.013**	2.32	
Non emerging country	328	-0.011**	2.39	1.10
Emerging country	47	0.003	0.25	
Type of mergers				
Related mergers	232	-0.015***	3.08	1.80
Non related mergers	143	0.001	0.12	
Type of payment				
Cash	343	-0.010***	3.06	0.56
Shares	32	0.008	0.24	
% of the acquiring CEO's compensation derived from executive stock options				
Below Median	187	-0.010	1.39	0.17
Above median	187	-0.010*	1.82	
Pre-merger default risk (PHI-1)				
Below Median	187	0.011***	4.00	4.97
Above median	187	-0.029***	3.84	
RUNM				
Below Median	187	-0.015***	2.93	1.63
Above median	187	-0.002	0.29	
VOL				
Below Median	187	-0.012***	4.77	0.71
Above median	187	-0.006	0.76	
GEO				
Below Median	187	-0.016***	3.25	1.73
Above median	187	-0.002	0.27	
MKTVAL				
Below Median	187	-0.013*	1.75	0.99
Above median	187	-0.005	1.35	
Q				
Below Median	187	-0.007	1.02	0.41
Above median	187	-0.011**	2.49	
LEV				
Below Median	187	-0.012*	1.77	0.74
Above median	187	-0.006	1.22	
UAI				
Below Median	187	-0.005	0.72	1.03
Above median	187	-0.013***	2.59	

PHI-1 is the probability to default before the merger announcements. RUNM is the buy and hold return of an acquirer's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the market index (S&P 500) return over the same period. VOL is the standard deviation of the idiosyncratic component of the acquirer's stock return. Q is Tobin's q ratio. LEV is leverage ratio. SHARES is a dummy variable is the merger is financed at least partially with stock. GEO is the distance between the acquirer's country and target's country. MKTVAL is the market value of the acquiring firm in the merger announcement year. RELATED is a dummy variable if the target's industry is the same as the acquirer's industry. UAI is the difference between the Uncertainty Avoidance Index of the acquirer's country (US) and that of the target's country. PRIVATE is a dummy variable for private companies. *t*-stat Mean is *t*-statistics of the mean variable. *t*-stat Mean Difference is *t*-statistics on the difference of the mean variable assuming unequal variances.

*,**,*** denote significance at 10%, 5%, 1% respectively.

a,b,c denote significance at 1%, 5%, 10% respectively.

Table 4

	PRIVATE	RUNM	VOL	GEO (Miles)	MKTVAL (USth)	Q	SHARES	LEV	RELATED	UAI	EXSAMPLE	OPTIONS	HR	DANTIDIR	DORIGIN	DCHECK	STOCKMKTDE	DDISC	DDISCFIL
RUNM	0.036																		
VOL	-0.069	-0.062																	
GEO (Miles)	0.026	-0.009	0.047																
MKTVAL (USth)	-0.103	0.033	-0.213	0.046															
Q	0.046	0.061	-0.071	-0.084	0.263														
SHARES	-0.003	0.007	0.357	-0.034	0.074	0.067													
LEV	-0.034	-0.033	-0.112	-0.011	0.117	-0.137	0.021												
RELATED	-0.008	0.008	-0.012	0.049	-0.096	-0.082	-0.035	0.023											
UAI	0.055	0.063	-0.131	-0.106	0.108	0.018	-0.011	0.022	-0.076										
EXSAMPLE	-0.090	0.037	-0.369	0.107	0.132	-0.087	-0.336	0.119	0.008	0.000									
OPTIONS	-0.037	0.039	-0.094	0.079	0.016	0.031	-0.158	0.041	0.016	-0.029	0.422								
HR	-0.002	-0.016	0.287	0.072	-0.210	-0.169	0.096	-0.052	0.036	-0.079	-0.123	-0.073							
DANTIDIR	0.071	0.007	0.082	0.120	-0.027	-0.042	0.071	0.019	-0.001	-0.414	-0.048	-0.041	0.069						
DORIGIN	0.169	-0.006	0.053	0.300	-0.028	-0.030	-0.028	-0.026	0.077	-0.636	0.024	0.056	0.029	0.684					
DCHECK	0.181	0.014	-0.052	0.346	0.041	-0.051	-0.073	-0.008	-0.047	0.302	0.055	0.030	0.025	-0.282	0.045				
DSTOCKMKTDEV	-0.062	0.005	0.167	0.105	-0.026	-0.068	0.059	-0.005	0.044	-0.587	0.025	0.028	0.096	0.423	0.515	-0.371			
DDISC	0.149	0.002	0.091	0.410	0.044	-0.099	0.012	0.009	0.086	-0.389	0.050	0.072	0.067	0.554	0.738	0.057	0.568		
DDISCFIL	0.132	0.021	0.016	0.224	-0.059	-0.066	-0.020	-0.015	0.119	-0.420	-0.004	0.046	0.020	0.387	0.734	0.030	0.451	0.727	
DENFORCE	0.159	-0.009	-0.050	0.332	0.043	0.007	0.003	0.026	-0.065	0.330	0.004	0.057	0.026	-0.220	-0.190	0.601	-0.417	-0.123	-0.334

PRIVATE is a dummy variable for private target companies. RUNM is the buy and hold return of an acquirer's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the market index (S&P 500) return over the same period. VOL is the standard deviation of the idiosyncratic component of the acquirer's stock return. GEO is the distance between the acquirer's country and target's country. MKTVAL is the market value of the acquiring firm in the merger announcement year. Q is Tobin's q ratio. SHARES is a dummy variable is the merger is financed at least partially with stock. LEV is leverage ratio. RELATED is a dummy variable if the target's industry is the same as the acquirer's industry. UAI is the difference between the Uncertainty Avoidance Index of the acquirer's country and that of the target's country. EXSAMPLE is a dummy variable if we have information on an acquirer's compensation in our database in the announcement year. OPTIONS is the fraction of the CEO's compensation that is derived from executive stock options. HR is a dummy variable for observations with above median pre-merger probability of default risk. DANTIDIR is the difference between antidirector index of the acquirer's country and that of the target's country. DORIGIN is the difference between the code for country origin of the acquirer's country and that of the target's country. DCHECK is the difference between the time to collect bounced checks in the acquirer's country and that of the target's country. DSTOCKMKTDEV is the difference between stock market development index of the acquirer's and that of the target's country. DDISC is the difference between prospectus disclosure index of the acquirer's country and that of the target's country. DDISCFIL is the difference between disclosure in periodic filling index of the acquirer's country and that of the target's country. DENFORCE is the difference between public enforcement index of the acquirer's country and that of the target's country.

Table 5.

Determinants of change in risk following cross-border mergers: US acquirers vs. international targets

PRIVATE	-0.004	-0.004	-0.001	-0.001	-0.004	-0.003	-0.003	-0.003
	(0.673)	(0.637)	(0.916)	(0.871)	(0.683)	(0.724)	(0.769)	(0.729)
RUNM	0.201***	0.200***	0.201***	0.200***	0.199***	0.201***	0.202***	0.199***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
VOL	2.427***	2.419***	2.431***	2.427***	2.372***	2.442***	2.417***	2.444***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Q	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
	(0.153)	(0.153)	(0.174)	(0.107)	(0.159)	(0.148)	(0.150)	(0.149)
LEV	0.002	0.001	0.002	0.001	0.001	0.002	0.002	0.001
	(0.733)	(0.766)	(0.685)	(0.820)	(0.774)	(0.725)	(0.727)	(0.743)
SHARES	-0.010	-0.011	-0.011	-0.012	-0.011	-0.010	-0.010	-0.010
	(0.482)	(0.464)	(0.457)	(0.401)	(0.462)	(0.489)	(0.481)	(0.516)
GEO	0.011**	0.010**	0.016**	0.016***	0.010**	0.012**	0.012**	0.013**
	(0.028)	(0.046)	(0.012)	(0.003)	(0.050)	(0.047)	(0.024)	(0.013)
MKTVAL	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.660)	(0.664)	(0.633)	(0.641)	(0.706)	(0.633)	(0.665)	(0.673)
RELATED	-0.016**	-0.016**	-0.016**	-0.017**	-0.016**	-0.016**	-0.015*	-0.017**
	(0.044)	(0.047)	(0.048)	(0.032)	(0.044)	(0.046)	(0.051)	(0.036)
DUAI	-0.015*	-0.013	-0.025**	-0.009	-0.011	-0.017*	-0.019*	-0.009
	(0.067)	(0.199)	(0.028)	(0.334)	(0.256)	(0.075)	(0.059)	(0.352)
HR	-0.049***	-0.049***	-0.049***	-0.049***	-0.049***	-0.049***	-0.049***	-0.049***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DANTIDIR		0.002						
		(0.668)						
DORIGIN			-0.015					
			(0.208)					
DCHECK				-0.016**				
				(0.023)				
DSTOCKMKTDEV					0.000			
					(0.330)			
DDISC						-0.007		
						(0.753)		
DDISCFIL							-0.011	
							(0.528)	
DENFORCE								-0.014
								(0.234)
Year Effects	Y	Y	Y	Y	Y	Y	Y	Y
Industry Effects	Y	Y	Y	Y	Y	Y	Y	Y
N	375	375	375	375	375	375	375	375
Adj. R-squared	0.2418	0.24	0.2432	0.2512	0.2417	0.2398	0.2405	0.2428

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Table 5 Continued

The dependent variable is ΔPHI, defined as the change in distance to default probability. PRIVATE is a dummy variable for private target companies. RUNM is the buy and hold return of an acquirer's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the market index (S&P 500) return over the same period. VOL is the standard deviation of the idiosyncratic component of the acquirer's stock return. Q is Tobin's q ratio. LEV is leverage ratio. SHARES is a dummy variable is the merger is financed at least partially with stock. GEO is the natural logarithm of the distance between the acquirer's country and target's country. MKTVAL is the natural logarithm of the market value of the acquiring firm in the merger announcement year. RELATED is a dummy variable if the target's industry is the same as the acquirer's industry. DUAI is a dummy variable of one if the difference between the Uncertainty Avoidance Index of the acquirer's country is the same or greater than that of the target's country, else zero. HR is a dummy variable for observations with above median pre-merger probability of default risk. DANTIDIR is the difference between antidirector index of the acquirer's country and that of the target's country. DORIGIN is the difference between the code for country origin of the acquirer's country and that of the target's country. DCHECK is the difference between the time to collect bounced checks in the acquirer's country and that of the target's country. DSTOCKMKTDEV is the difference between stock market development index of the acquirer's country and that of the target's country. DDISC is the difference between prospectus disclosure index of the acquirer's country and that of the target's country. DDISCFIL is the difference between disclosure in periodic filling index of the acquirer's country and that of the target's country. DENFORCE is the difference between public enforcement index of the acquirer's country and that of the target's country. *p*-values are in parentheses.

*, **, *** are significance at 10%, 5%, 1% respectively.

Table 6
Determinants of change in risk following cross-border mergers including stock options: US acquirers vs. international targets

PRIVATE	-0.003	-0.003	0.000	-0.001	-0.003	-0.002	-0.001	-0.002
	(0.769)	(0.737)	(0.977)	(0.948)	(0.775)	(0.847)	(0.892)	(0.818)
RUNM	0.196***	0.195***	0.197***	0.195***	0.194***	0.196***	0.197***	0.194***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
VOL	2.226***	2.222***	2.222***	2.247***	2.179***	2.246***	2.205***	2.244****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Q	-0.004	-0.004	-0.004	-0.005*	-0.004	-0.004	-0.004	-0.004
	(0.130)	(0.132)	(0.145)	(0.098)	(0.134)	(0.122)	(0.123)	(0.127)
LEV	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.002
	(0.674)	(0.704)	(0.618)	(0.761)	(0.710)	(0.659)	(0.660)	(0.683)
SHARES	-0.012	-0.013	-0.013	-0.014	-0.013	-0.012	-0.013	-0.012
	(0.414)	(0.404)	(0.390)	(0.353)	(0.393)	(0.423)	(0.408)	(0.443)
GEO	0.012**	0.011**	0.017***	0.017***	0.011**	0.013**	0.014**	0.014***
	(0.017)	(0.029)	(0.007)	(0.002)	(0.031)	(0.025)	(0.013)	(0.009)
MKTVAL	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.652)	(0.663)	(0.627)	(0.635)	(0.674)	(0.611)	(0.649)	(0.661)
RELATED	-0.016**	-0.016**	-0.016**	-0.017**	-0.016**	-0.016**	-0.015**	-0.017**
	(0.040)	(0.043)	(0.044)	(0.031)	(0.040)	(0.043)	(0.048)	(0.034)
DUAI	-0.016**	-0.014	-0.027**	-0.010	-0.012	-0.018**	-0.021**	-0.011
	(0.050)	(0.156)	(0.020)	(0.253)	(0.201)	(0.049)	(0.037)	(0.275)
EXSAMPLE	-0.019	-0.019	-0.020	-0.017	-0.019	-0.019	-0.020	-0.019
	(0.142)	(0.152)	(0.127)	(0.185)	(0.139)	(0.137)	(0.126)	(0.148)
OPTIONS	-0.003	-0.003	-0.001	-0.005	-0.004	-0.003	-0.002	-0.003
	(0.892)	(0.882)	(0.977)	(0.818)	(0.870)	(0.900)	(0.919)	(0.896)
HR	-0.061***	-0.061***	-0.061***	-0.060***	-0.061***	-0.061***	-0.061***	-0.060***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
HR*OPTIONS	0.061**	0.061**	0.059*	0.058*	0.060*	0.061**	0.061**	0.059*
	(0.049)	(0.048)	(0.054)	(0.059)	(0.051)	(0.047)	(0.048)	(0.054)
DANTIDIR		0.002						
		(0.714)						
DORIGIN			-0.015					
			(0.185)					
DCHECK				-0.014**				
				(0.041)				
DSTOCKMKTDEV					0.000			
					(0.374)			
DDISC						-0.010		
						(0.621)		
DDISCFIL							-0.014	
							(0.413)	
DENFORCE								-0.012
								(0.282)
Year Effects	Y	Y	Y	Y	Y	Y	Y	Y

Table 6 Continued

Industry Effects	Y	Y	Y	Y	Y	Y	Y	Y
N	375	375	375	375	375	375	375	375
Adj. R-squared	0.2501	0.2482	0.2518	0.2572	0.2496	0.2484	0.2494	0.2505

The dependent variable is ΔPHI, defined as the change in distance to default probability. PRIVATE is a dummy variable for private target companies. RUNM is the buy and hold return of an acquirer's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the market index (S&P 500) return over the same period. VOL is the standard deviation of the idiosyncratic component of the acquirer's stock return. Q is Tobin's q ratio. LEV is leverage ratio. SHARES is a dummy variable is the merger is financed at least partially with stock. GEO is the natural logarithm of the distance between the acquirer's country and target's country. MKTVAL is the natural logarithm of the market value of the acquiring firm in the merger announcement year. RELATED is a dummy variable if the target's industry is the same as the acquirer's industry. DUAI is a dummy variable of one if the difference between the Uncertainty Avoidance Index of the acquirer's country is the same or greater than that of the target's country, else zero. HR is a dummy variable for observations with above median pre-merger probability of default risk. EXSAMPLE is a dummy variable if we have information on an acquirer's compensation in our database in the announcement year. OPTIONS is the fraction of the CEO's compensation that is derived from executive stock options. DANTIDIR is the difference between antidirector index of the acquirer's country and that of the target's country. DORIGIN is the difference between the code for country origin of the acquirer's country and that of the target's country. DCHECK is the difference between the time to collect bounced checks in the acquirer's country and that of the target's country. DSTOCKMKTDEV is the difference between stock market development index of the acquirer's country and that of the target's country. DDISC is the difference between prospectus disclosure index of the acquirer's country and that of the target's country. DDISCFIL is the difference between disclosure in periodic filling index of the acquirer's country and that of the target's country. DENFORCE is the difference between public enforcement index of the acquirer's country and that of the target's country. *p*-values are in parentheses.

*, **, *** are significance at 10%, 5%, 1% respectively.

Table 7

Determinants of change in risk following cross-border mergers-legal system dummies: US acquirers vs. international targets

EMERGING	0.003		
	(0.823)		
UK		-0.010	
		(0.501)	
COMLAW			0.015
			(0.185)
PRIVATE	-0.003	-0.003	0.000
	(0.768)	(0.773)	(0.977)
RUNM	0.196***	0.195***	0.197***
	(0.000)	(0.000)	(0.000)
VOL	2.212***	2.183***	2.222***
	(0.000)	(0.000)	(0.000)
Q	-0.004	-0.004	-0.004
	(0.134)	(0.130)	(0.145)
LEV	0.002	0.002	0.002
	(0.684)	(0.720)	(0.618)
SHARES	-0.012	-0.012	-0.013
	(0.412)	(0.420)	(0.390)
GEO	0.011**	0.011**	0.017***
	(0.023)	(0.022)	(0.007)
MKTVAL	0.001	0.001	0.001
	(0.661)	(0.704)	(0.627)
RELATED	-0.016**	-0.016**	-0.016**
	(0.040)	(0.041)	(0.044)
DUAI	-0.016*	-0.009	-0.027**
	(0.056)	(0.498)	(0.020)
EXSAMPLE	-0.019	-0.019	-0.020
	(0.143)	(0.149)	(0.127)
OPTIONS	-0.003	-0.003	-0.001
	(0.889)	(0.888)	(0.977)
HR	-0.061***	-0.061***	-0.061***
	(0.000)	(0.000)	(0.000)
HR*OPTIONS	0.060*	0.061**	0.059*
	(0.053)	(0.047)	(0.054)
Year Effects	Y	Y	Y
Industry Effects	Y	Y	Y
N	375	375	375
Adj. R-squared	0.248	0.249	0.252

Table 7 Continued

The dependent variable is ΔPHI, defined as the change in distance to default probability. EMERGING is a dummy variable if a target nation is an emerging country. UK is a dummy variable if a target nation is the UK. COMLAW is a dummy variable if a target nation is a common law country. PRIVATE is a dummy variable for private target companies. RUNM is the buy and hold return of an acquirer's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the market index (S&P 500) return over the same period. VOL is the standard deviation of the idiosyncratic component of the acquirer's stock return. Q is Tobin's q ratio. LEV is leverage ratio. SHARES is a dummy variable is the merger is financed at least partially with stock. GEO is the natural logarithm of the distance between the acquirer's country and target's country. MKTVAL is the natural logarithm of the market value of the acquiring firm in the merger announcement year. RELATED is a dummy variable if the target's industry is the same as the acquirer's industry. DUAI is a dummy variable of one if the difference between the Uncertainty Avoidance Index of the acquirer's country is the same or greater than that of the target's country, else zero. HR is a dummy variable for observations with above median pre-merger probability of default risk. EXSAMPLE is a dummy variable if we have information on an acquirer's compensation in our database in the announcement year. OPTIONS is the fraction of the CEO's compensation that is derived from executive stock options. *p*-values are in parentheses.

*, **, *** are significance at 10%, 5%, 1% respectively.