# Cross-Border Mergers and Acquisitions and Default Risk

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## Abstract

Using a cross-country sample of mergers and acquisitions, we examine the role of cultural, institutional, geographic and managerial factors on post-merger default risk. Our results are consistent with the asymmetric hypothesis that managers take advantage of the overvaluation and volatility of their firm stock prices. We also find that geographic distance and industrial diversification play significant roles in affecting post-merger default risk. We find limited evidence indicating the relevance of institutional quality and culture on default risk.

**Key words**: Cross-border Mergers, Default risk, Idiosyncratic risk

**JEL Classification**: G34, G32, M14

# Cross-Border Mergers and Acquisitions and Default Risk

## 1. Introduction

Cross-border mergers and acquisitions have been very popular in recent times accounting for 45% of total merger volume in 2007 (Erel, et al. 2012). These mergers have different characteristics from those of domestic mergers due to cross–border effects. In cross border mergers, the difference in country–level characteristics between two countries, such as the quality of accounting disclosure, culture, geography, corporate governance and bilateral trade are reported to have significant roles on the likelihood of cross border mergers (Ahern, et al., forthcoming; Erel et al., 2012).

Firms engaging in cross-border mergers can increase their value by acquiring targets in countries with weaker governance regimes (Moeller and Schlingemann, 2005; Bris and Cabolis, 2008; Rossi and Volpin, 2004) or by purchasing targets in related industries (Dos Santos, Errunza and Miller, 2008). The opportunity to create value via cross-border mergers can also arise from wealth effects and valuation error. Erel et al. (2012) and Froot and Stein (1991) suggest that a stronger domestic currency relative to other foreign currencies motivates firms to engage in cross border mergers as the price of foreign targets become less expensive. Similarly, when the stock price of an acquirer is overvalued, it is more likely to issue shares to acquire (undervalued) targets (Shleifer and Vishny, 2003).

A recent study suggests that mergers can not only create or destroy a firm's value, but also change the firm's risk. Furfine and Rosen (2011) document that domestic mergers, on average, increase default risk of the acquiring firm. They find that idiosyncratic risk, past stock performance, valuation error, type of payment and agency problem may explain the increase in default risk.

1

The impact of cross-border mergers on the acquiring firms' default risk however, has not been comprehensively examined. Due to different characteristics and determinants of cross border mergers from those of domestic merger, the findings on domestic mergers may not be applicable to international mergers. In this paper, we extend Furfine and Rosen (2011) by observing the effects of cross-border mergers on a firm's default risk. We find that, in contrast to domestic mergers, cross-border mergers reduce default risk. Furthermore, we observe that the determinants are mostly different from those in domestic mergers. We find evidence consistent with overvaluation of US firms may lead managers to make risk increasing mergers (Shleifer and Vishny, 2003). We also find that geographic distance between the two countries and industrial diversification affects default risk. National culture has negative but limited relations with default risk. However, consistent with Furfine and Rosen (2011), we find that idiosyncratic risk is positively related to default risk. Finally, we find that mergers financed with shares are negatively related to default risk, but these relations are not statistically significant.

The rest of the paper is organized as follows. In the next section, we describe our data and methodology. In section 3, we report the results of our empirical study. Our conclusions are offered in the final section.

## 2. Methodology and Data

### 2.1 Methodology

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, $\mu$ is the expected continuously compounded return on V, $\sigma v$ is the volatility of firm value and $dW$ is a standard Wiener process. The market value of equity, E, is:

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

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:

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

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

The volatility of the firm and its equity:

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

The distance to default is calculated as:

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

and the implied probability of default is:

$$\pi = N(-DD)$$ (6)

Using the naïve version of the Merton (1974) DD model, Bharath and Shumway (2008) report that their distance to default model is superior in hazard models and in out of sample forecasts than the existing models. Thus, we follow Bharath and Shumway (2008) in measuring probability of default risk[1]. We measure F as total current liabilities plus one half of long term debt (Bharath and Shumway, 2008; Vassalou and Xing, 2004). E is the market capital of the firm's equity. The volatility of each firm's debt is estimated as:

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

where $\sigma_D$ is $0.05 + 0.25\sigma_E$ and $\sigma_E$ is the annualized percent standard deviation of returns, estimated from thirteen months to one month prior to the merger announcement. Bharath and Shumway

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

(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 ($\mu$). 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:

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

We use independent variables that are reported to have significant effects on default risk in mergers and as determinants in cross-border mergers. Furfine and Rosen (2011) suggest that idiosyncratic risk, valuation errors proxied by past stock performance and market to book ratio, firm size and type of payment have significant impact on default risk in domestic mergers. They find that idiosyncratic risk increases default risk in domestic mergers. Following Furfine and Rosen (2011) we measure idiosyncratic risk (VOL) as the standard deviation of the idiosyncratic component of the acquirer's stock return estimated over the six month period ending one month prior to the merger announcement. Inconsistent with the overvaluation hypothesis, Furfine and Rosen find that acquirers with poor past stock performance tend to make risk enhancing domestic mergers. Following their methodology, our proxies for valuation errors are 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 (RUNM) and Tobin's q. Market size (MKTVAL) is calculated as the natural logarithm of market capitalization and we use a dummy for mergers financed at least with stocks (SHARES). In addition, we also use a dummy if the acquirer's industry is the same as the target firm's industry (RELATED).

Erel et al. (2012) examine the determinants of cross-border mergers and acquisitions. They find that geography, the quality of accounting disclosure, and bilateral trade increase the likelihood

4

of mergers between two countries. They also indicate that cultural differences[2] play insignificant role in cross border mergers which is in stark odds with a recent study (Ahern et al., forthcoming).

Ahern et al. (forthcoming) examine the role of national cultural values on the pattern of cross-border merger activity and the gains they create. Using a comprehensive sample of 20,893 cross-border mergers from 52 different countries over 1991–2008, they find that culture has a significant and economically important effect on the volume of cross-border mergers. After controlling for country-level fixed effects and a range of country-pair variables such as shared legal origin, language, religion, geographic distance they find a strong negative relationship between cultural distance and the volume of 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. Likewise, less cultural distance leads to higher combined announcement returns in cross-border mergers. Overall, the work of Ahern et al. (forthcoming) is consistent with the view that cultural differences impose costly frictions between firms leading to fewer mergers.

We control for country-level corporate governance mechanisms, such as the revised antidirector index (ANTIDIR), legal origin (ORIGIN), ownership concentration (OWN), stock market capitalization to GDP (STOCKMKTDEV), 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), from Djankov, La Porta, Lopez De Silanes and Shleifer (2008). We also include the distance between the capital cities of a country pair (GEO).

We use the uncertainty avoidance score (UAI) from Hofstede (1980, 2001) as our proxy for natural cultural value. Uncertainty avoidance is one of the facets of natural cultural attributes constructed by Hofstede. Hofstede's uncertainty avoidance score has been used in finance by several scholarly works (Beugelsdijk and Frijns, 2010 and Anderson et al., 2011) in their studies on the determinants of the home bias. These studies show that institutional investors from high

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[2] They have different measures of culture variables than Ahern et al.

uncertainty avoidance countries invest less in foreign equities, which may be supported by the belief that investors may perceive foreign assets to be more risky and hence do not invest in them.

Venaik and Brewer (2010) posit that Hofstede's uncertainty avoidance score principally measures the stress component of dealing with uncertain situations. 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.

Our industry and year fixed effect regression model is the following:

$$DMU_t = \alpha + \beta RUNM_t + \beta VOL_t + \beta Q_t + \beta LEV_t + \beta SHARES_t + \beta LNGEO_t + \beta LNMKTVAL_t$$
$$+ \beta RELATED_t + \beta DUAI_t + \beta DDANTIDIR_t + \beta DDORIGIN_t + \beta DDCHECK_t$$
$$+ \beta DDSTOCKMKTDEV_t + \beta DDDISC_t + \beta DDDISCFIL_t$$
$$+ \beta DDENFORCE_t + \text{Industry dummy} + \text{Year dummy} + \varepsilon_t$$

Definition of Variables:

DMU is the change in distance to default probability calculate following Bharath and Shumway (2008) DD model.

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 the difference between the Uncertainty Avoidance Index which is a Hofstede's culture variable, of the acquirer's country and that of the target's country.

DDANTIDIR is a dummy variable if the difference between antidirector index of the acquirer's country is the same or greater than that of the target's country.

DDORIGIN is a dummy variable if the difference between the code for country origin of the acquirer's country is the same or greater than that of the target's country.

DDCHECK is a dummy variable if the difference between the time to collect bounced checks in the acquirer's country is the same or greater than that of the target's country.

DDSTOCKMKTDEV is a dummy variable if the difference between stock market development index of the acquirer's country is the same or greater than that of the target's country.

DDDISC is a dummy variable if the difference between prospectus disclosure index of the acquirer's country is the same or greater than that of the target's country.

DDDISCFIL is a dummy variable if the difference between disclosure in periodic filling index of the acquirer's country is the same or greater than that of the target's country.

DDENFORCE is a dummy variable if the difference between public enforcement index of the acquirer's country is the same or greater than that of the target's country.

*2.2 Data*

We collect cross-border mergers data from Zephyr database. 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. From Zephyr, 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 taken from Datastream. We use data from Osiris and Datstream to measure 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 such as the revised antidirector index (ANTIDIR), country of origin (ORIGIN), time to collect bounced checks (CHECK), ownership concentration (OWN), stock market development (SOCKMKTDEV), prospectus disclosure index (DISC), periodic filling index (DISCFIL) and enforcement index (ENFORCE) from Djankov et al. (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 1,407 firm year observations.

## 3. Empirical Results

We provide descriptive statistics of our sample in Table 1. We find that default risk decreases after cross-border mergers. This result is inconsistent with Furfine and Rosen (2011) but consistent with

Leland (2007). Also, most mergers are related mergers and are cash transactions. The median geographic distance between headquarters of US acquirers and targets is approximately 3,800 miles. Targets countries typically have higher uncertainty avoidance scores antidirector index values than US. Targets countries are generally from similar legal origin as the US. Typically, it takes longer to collect bounced checks in target countries than acquirer countries. In general, the acquiring country (US) has a better developed stock market and has higher disclosure indices than target countries.

In table 2, we report the correlation between key variables used in the study. Most correlation values, except for country-level governance variables, are small and do not have a potential for multicollinearity. The strong correlations among country-level governance variables preclude us from using these variables simultaneously in our multiple regressions.

We regress the change in default risk measured by DMU, the change in distance to default probability, on a number of independent variables capturing firm specific factors, culture, geographic distance and institutional quality. The results for the total sample are provided in Table 3, while subsample results are reported in Table 3. The results from Table 3 reveal several interesting findings. First, it appears that idiosyncratic risk (VOL), managerial issues (RUNM) and geographic distance (LNGEO) significantly affect the post-merger default risk in the case of cross-border mergers. Consistent with the overvaluation hypothesis, firms with good past stock performance are likely to engage in risky acquisitions. The positive VOL is consistent with the notion that high idiosyncratic risk means high information asymmetry which result in more inefficient mergers that increase default risk. Geographic distance between the two countries is positively related to default risk. Second, firm size (LNMKTVAL) does not seem to have any significant effect on post-merger default risk and the difference in culture (DUAI) has limited impact on default risk. The results also show that institutional quality does not have any significant effect on default risk.

## 4. Conclusion

In this paper, we examine the impact of cross-border acquisitions on post-merger default risk. Our major finding is that managerial factors and geographic distance do play significant roles in affecting post-merger default risk. In contrast to the findings of Furfine and Rosen (2011) we find that managerial incentives in cross border mergers are different from those in domestic mergers.

**References**


Ahern, K., Daminelli, D., Fracassi, C. (forthcoming). Lost in translation? The effect of cultural values on mergers around the world. *Journal of Financial Economics*.

Anderson, C., Fedenia, M., Hirschey, M., & Skiba, H. (2011). Cultural influences on home bias and international diversification by institutional investors. *Journal of Banking and Finance 35*, 916–934.

Bharath, S. T., Shumway, T. (2008). Forecasting default with the Merton distance to default model. *Review of Financial Studies 21*, 1339–1369.

Beugelsdijk, S., Frijns, B. (2010). A cultural explanation of the foreign bias in international asset allocation. *Journal of Banking and Finance 34*, 2121–2131.

Bris, A., and Cabolis, C. (2008). The Value of Investor Protection: Firm Evidence from Cross-Border Mergers. *Review of Financial Studies 21*, 605–48.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2008). The law and economics of self-dealing, *Journal of Financial Economics 88*, 430–465.

Dos Santos, M.B., Errunza, V.R., & Miller, D.P. (2008). Does corporate international diversification destroy value? Evidence from cross-border mergers and acquisitions. *Journal of Banking and Finance 32*, 2716-2724.

Erel, I., Liao, R.C., Weisbach, M.S. (2012). Determinants of cross-border mergers and acquisitions. *Journal of Finance 67*, 1031–1043.

Froot, K. A., and Stein, J.C. (1991). Exchange rates and foreign direct investment: An imperfect capital markets approach. *Quarterly Journal of Economics 106*, 1191–1217.

Furfine, C.H., and Rosen, R.J. (2011). Mergers increase default risk. *Journal of Corporate Finance 17*, 832–849.

Hofstede, G. (1980). *Culture's Consequences: International Differences in Work Related Values*. Sage, Beverly Hills, CA.

Hofstede, G. (2001). *Culture's Consequences: International Differences in Work-Related Values*. second ed. Sage Publications, Beverly Hills, CA.

Leland, H.E. (2007). Financial synergies and the optimal scope of the firm, implications for mergers, spinoffs, and structured finance. *Journal of Finance 62*, 765-807.

Merton, R C. (1974). On the pricing of corporate debt: The risk structure of interest rates, *Journal of Finance 29*, 449–470.

Moeller, S.B. and Schlingemann, F.P. (2005). Global diversification and bidder gains: A comparison between cross border and domestic acquisitions. *Journal of Banking and Finance 29*, 533-564.

Shleifer, A, and Vishny, R.W. (2003). Stock market driven acquisitions, *Journal of Financial Economics 70*, 295–311.

Vassalao, M. and Xing, Y. (2004). Default risk in equity returns, *Journal of Finance 59(2),* 831-868.

Venaik, S. and Brewer, P. (2010). Avoiding uncertainty in Hofstede and GLOBE. *Journal of International Business Studies 41*, 1294–1315.

**Table 1.**

**Descriptive statistics**

|                | MEAN       | SD         | MIN      | 1Q       | MEDIAN    | 3Q          | MAX         |
|----------------|------------|------------|----------|----------|-----------|-------------|-------------|
| DMU            | -0.009     | 0.080      | -0.508   | -0.244   | 0.000     | 0.297       | 0.483       |
| RUNM           | 0.010      | 0.082      | -0.207   | -0.204   | 0.006     | 0.258       | 0.259       |
| VOL            | 0.019      | 0.009      | 0.007    | 0.007    | 0.017     | 0.052       | 0.054       |
| GEO (Miles)    | 3,667      | 1,875      | 458      | 458      | 3,835     | 9,917       | 9,917       |
| MKTVAL (US$ th)| 18,209,133 | 47,559,564 | 43,825   | 43,825   | 2,641,302 | 277,060,300 | 277,060,300 |
| TOBIN          | 2.422      | 1.564      | 0.761    | 0.767    | 1.962     | 9.130       | 9.165       |
| SHARES         | 0.085      | 0.280      | 0.000    | 0.000    | 0.000     | 1.000       | 1.000       |
| LEV            | 0.655      | 0.862      | 0.000    | 0.000    | 0.435     | 5.107       | 5.312       |
| RELATED        | 0.619      | 0.486      | 0.000    | 0.000    | 1.000     | 1.000       | 1.000       |
| UAI            | -7.691     | 20.117     | -48.000  | -48.000  | -2.000    | 23.000      | 23.000      |
| DANTIDIR       | -0.952     | 1.002      | -2.000   | -2.000   | -1.000    | 2.000       | 2.000       |
| DORIGIN        | 0.483      | 0.500      | 0.000    | 0.000    | 0.000     | 1.000       | 1.000       |
| DCHECK         | -1.118     | 0.700      | -2.594   | -2.510   | -1.048    | 0.325       | 0.325       |
| DSTOCKMKTDEV   | 35.534     | 51.012     | -106.818 | -106.818 | 35.960    | 125.746     | 125.746     |
| DDISC          | 0.321      | 0.233      | 0.080    | 0.080    | 0.250     | 1.000       | 1.000       |
| DDISCFIL       | 0.212      | 0.271      | 0.000    | 0.000    | 0.000     | 0.800       | 0.800       |
| DENFORCE       | -0.458     | 0.445      | -1.000   | -1.000   | -0.500    | 0.000       | 0.000       |

DMU is the change in distance to default probability. 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. 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 2.**

**Correlation matrix**

|  | RUNM | VOL | GEO (Miles) | KTVAL (US$ t | TOBIN | SHARES | LEV | RELATED | UAI | DANTIDIR | DORIGIN | DCHECK | TOCKMKTD | DDISC | DDISCFIL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VOL | -0.062 | | | | | | | | | | | | | | |
| GEO (Miles) | -0.009 | 0.047 | | | | | | | | | | | | | |
| MKTVAL (US$ th | 0.033 | -0.213 | 0.046 | | | | | | | | | | | | |
| TOBIN | 0.061 | -0.071 | -0.084 | 0.263 | | | | | | | | | | | |
| SHARES | 0.007 | 0.357 | -0.034 | 0.074 | 0.067 | | | | | | | | | | |
| LEV | -0.033 | -0.112 | -0.011 | 0.117 | -0.137 | 0.021 | | | | | | | | | |
| RELATED | 0.008 | -0.012 | 0.049 | -0.096 | -0.082 | -0.035 | 0.023 | | | | | | | | |
| UAI | 0.063 | -0.131 | -0.106 | 0.108 | 0.018 | -0.011 | 0.022 | -0.076 | | | | | | | |
| DANTIDIR | 0.007 | 0.082 | 0.120 | -0.027 | -0.042 | 0.071 | 0.019 | -0.001 | -0.414 | | | | | | |
| DORIGIN | -0.006 | 0.053 | 0.300 | -0.028 | -0.030 | -0.028 | -0.026 | 0.077 | -0.636 | 0.684 | | | | | |
| DCHECK | 0.014 | -0.052 | 0.346 | 0.041 | -0.051 | -0.073 | -0.008 | -0.047 | 0.302 | -0.282 | 0.045 | | | | |
| DSTOCKMKTDEV | 0.005 | 0.167 | 0.105 | -0.026 | -0.068 | 0.059 | -0.005 | 0.044 | -0.587 | 0.423 | 0.515 | -0.371 | | | |
| DDISC | 0.002 | 0.091 | 0.410 | 0.044 | -0.099 | 0.012 | 0.009 | 0.086 | -0.389 | 0.554 | 0.738 | 0.057 | 0.568 | | |
| DDISCFIL | 0.021 | 0.016 | 0.224 | -0.059 | -0.066 | -0.020 | -0.015 | 0.119 | -0.420 | 0.387 | 0.734 | 0.030 | 0.451 | 0.727 | |
| DENFORCE | -0.009 | -0.050 | 0.332 | 0.043 | 0.007 | 0.003 | 0.026 | -0.065 | 0.330 | -0.220 | -0.190 | 0.601 | -0.417 | -0.123 | -0.334 |

DMU is the change in distance to default probability. 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. 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.**

**Determinants of Change in Risk Following Cross-border mergers:  US acquirers vs. International targets**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RUNM | 0.181*** | 0.181*** | 0.183*** | 0.180*** | 0.180*** | 0.182*** | 0.182*** | 0.182*** | 0.181*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| VOL | 1.856*** | 1.870*** | 1.839*** | 1.900*** | 1.812*** | 1.866*** | 1.848*** | 1.885*** | 1.735*** |
| | (0.002) | (0.002) | (0.003) | (0.002) | (0.003) | (0.002) | (0.003) | (0.002) | (0.005) |
| Q | -0.002 | -0.002 | -0.001 | -0.002 | -0.002 | -0.002 | -0.002 | -0.002 | -0.002 |
| | (0.529) | (0.526) | (0.596) | (0.409) | (0.550) | (0.519) | (0.532) | (0.497) | (0.592) |
| LEV | 0.002 | 0.002 | 0.003 | 0.003 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| | (0.629) | (0.613) | (0.587) | (0.557) | (0.664) | (0.621) | (0.626) | (0.659) | (0.660) |
| SHARES | -0.010 | -0.010 | -0.010 | -0.010 | -0.011 | -0.010 | -0.010 | -0.010 | -0.014 |
| | (0.507) | (0.534) | (0.497) | (0.516) | (0.489) | (0.516) | (0.509) | (0.530) | (0.367) |
| GEO | 0.009* | 0.010* | 0.014** | 0.011** | 0.009* | 0.010* | 0.010* | 0.012** | 0.022*** |
| | (0.062) | (0.059) | (0.032) | (0.030) | (0.061) | (0.092) | (0.078) | (0.026) | (0.004) |
| MKTVAL | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| | (0.119) | (0.119) | (0.121) | (0.113) | (0.130) | (0.115) | (0.122) | (0.129) | (0.156) |
| RELATED | -0.015* | -0.016* | -0.015* | -0.016** | -0.015* | -0.015* | -0.015* | -0.016** | -0.015* |
| | (0.059) | (0.057) | (0.063) | (0.044) | (0.063) | (0.061) | (0.063) | (0.044) | (0.062) |
| DUAI | -0.014 | -0.015* | -0.023* | -0.018** | -0.008 | -0.015 | -0.015 | -0.002 | -0.006 |
| | (0.102) | (0.095) | (0.050) | (0.044) | (0.511) | (0.109) | (0.128) | (0.822) | (0.675) |
| DDANTIDIR | | -0.004 | | | | | | | 0.024 |
| | | (0.697) | | | | | | | (0.101) |
| DORIGIN | | | -0.013 | | | | | | -0.031 |
| | | | (0.262) | | | | | | (0.066) |
| DDCHECK | | | | -0.032* | | | | | -0.027 |
| | | | | (0.060) | | | | | (0.205) |
| DDSTOCKMKTDEV | | | | | 0.009 | | | | 0.019 |
| | | | | | (0.461) | | | | (0.225) |
| DDISC | | | | | | -0.006 | | | -0.008 |
| | | | | | | (0.774) | | | (0.806) |
| DDISCFIL | | | | | | | -0.004 | | 0.002 |
| | | | | | | | (0.820) | | (0.932) |
| DDENFORCE | | | | | | | | -0.019* | -0.021 |
| | | | | | | | | (0.079) | (0.171) |
| | | | | | | | | | |
| Year Effects | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Industry Effects | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| | | | | | | | | | |
| N | 375 | 375 | 375 | 375 | 375 | 375 | 375 | 375 | 375 |
| R-squared | 0.260 | 0.260 | 0.263 | 0.268 | 0.261 | 0.260 | 0.260 | 0.267 | 0.281 |

The dependent variable is DMU, defined as the change in distance to default probability. 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. 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 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 and that of the target's country is the same or greater than that of the target's country, else zero. DDANTIDIR is a dummy variable of one if the difference between antidirector index of the acquirer's country is the same or greater than that of the target's country, else zero. DORIGIN is the difference between the code for country origin of the acquirer's country and that of the target's country. DDCHECK is a dummy variable of one if the difference between the time to collect bounced checks in the acquirer's country is the same or greater than that of the target's country, else zero. DDSTOCKMKTDEV is a dummy variable of one if the difference between stock market development index of the acquirer's country is the same or greater than that of the target's country, else zero. 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. DDENFORCE is a dummy variable of one if the difference between public enforcement index of the acquirer's country is the same or greater than that of the target's country, else zero.

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