Does Takeover Activity Affect Stock Price Crash Risk? Evidence from International M&A Laws

Balasingham Balachandran*

Department of Economics and Finance, La Trobe Business School, La Trobe University

Email:B.Balachandran@latrobe.edu.au; Phone: +61394793103

Huu Nhan Duong

Department of Banking and Finance, Monash Business School, Monash University;

Email: Huu.Duong@monash.edu.au; Phone: +61399032032

Hoang Luong

UQ Business School, The University of Queensland

Email: hoang.luong@fulbrightmail.org; Phone: +61426141955

Lily Nguyen

UQ Business School, The University of Queensland

Email: lily.nguyen@uq.edu.au; Phone: +61403101181

Acknowledgements: We thank Marie-Ann Cam, Kien Cao, Viet Dang, Lisa Farrel, Tim Fry, Petko Kalev, Paul Kim, Ron Masulis, My Nguyen, Peter Pham, Monica Tan, Xiangkang Yin, and other department seminar participants at La Trobe University, RMIT University, and the 5th Vietnam International Conference in Finance, 2018 for helpful comments.

*Corresponding Address:
Prof. Balasingham Balachandran
Department of Economics and Finance
La Trobe Business School
La Trobe University
VIC 3086
Australia

Does Takeover Activity Affect Stock Price Crash Risk? Evidence from International M&A Laws

Abstract

Using the staggered initiation of merger and acquisition (M&A) laws across countries as a plausibly exogenous shock to the threat of takeover, we find that stock price crash risk significantly decrease after the initiation of an M&A law in a country. This effect is stronger in countries with poorer investor protection and information environments but weaker for firms with greater institutional block ownership, product market competition, and analyst coverage. Digging further into an explicit form of managerial bad news hoarding, a precursor of crash risk, we find that earnings management significantly decreases in the post-law periods. Our findings suggest that takeover threat leads to lower crash risk through strengthening managerial discipline.

JEL Classifications: G1; G3; G34

Key words: M&A laws; takeover; crash risk; bad news hoarding; earnings management

I. Introduction

The market for corporate control is one of the most important external governance mechanisms for aligning the interests of managers with those of shareholders (e.g., Fama and Jensen, 1983; Jensen and Ruback, 1983; Lel and Miller, 2015). In this study, we exploit the staggered initiation of merger and acquisition (M&A) laws across countries to examine the effect of an active takeover market on stock price crash risk (crash risk). The agency theory predicts that, due to information asymmetry between management and shareholders, managers may have an incentive to delay the release of bad news to the market because disclosure of such news can jeopardize their careers and compensation (Kothari, Shu, and Wysochi, 2009); however, managers cannot withhold bad news indefinitely, because when accumulated beyond some tipping point, all the bad news must be revealed to the market, causing stock price crashes (Jin and Myers, 2006). Although prior research has documented various factors that affect stock price crashes,[1] there is limited work, especially in an international setting, on whether an active takeover market affects crash risk. We attempt to fill this gap.

Over the past decades, regulators around the world have passed M&A laws to foster takeover activity. The main objectives of these laws are to reduce barriers to M&A transactions, encourage information dissemination, and increase shareholder protection. Recent evidence (Glendening, Khurana, and Wang, 2016; Lel and Miller, 2015) shows that the passage of M&A laws significantly increases takeover activity after the initiation of M&A laws. Arguably, the

[1] Research that focuses on the U.S. market has documented a number of determinants of crash risk, such as earnings management (Hutton et al., 2009), equity incentives to chief financial officers (Kim et al., 2011a), complex tax shelters (Kim et al., 2011b), institutional ownership (An and Zhang, 2013), audit quality (Robin and Zhang, 2015), religiosity (Callen and Fang, 2015), accounting conservatism (Kim and Zhang, 2016), overconfident managers (Kim et al., 2016), corporate governance (Andreou et al., 2016), chief executive officer (CEO) age (Andreou et al., 2017), stock liquidity (Chang, Chen, Zolotoy, 2017), employee welfare (Ben-Nasr and Ghouma, 2018), and real earnings management (Khurana et al., 2018).

enactment of M&A laws creates a plausibly exogenous shock to the threat of takeover because these laws are passed by countries and are not endogenously driven at the firms' discretion (i.e., they are national laws, not policies set by firms).[2] Therefore, the initiation of M&A laws provides us with an ideal setting to examine the effect of an active takeover market on crash risk because it allows us to better tackle endogeneity and omitted-variable biases. Another advantage of using the M&A law enactment as a shock to the threat of takeover is that we can exploit cross-country differences in legal and institutional structures to identify the effects of M&A law enactment on crash risk.

We propose two competing hypotheses regarding the effect of the adoption of M&A laws on crash risk. First, an active market for corporate control can lead to lower future crash risk by strengthening managerial discipline, which restrains managerial bad news hoarding behavior, a precursor of stock price crashes. Our argument is based on the central idea that managerial bad news hoarding stems from a standard agency problem in which managers undertake corporate activities that are not in the best interests of shareholders and, consequently, their preferences for bad news disclosure arising from such activities are not aligned with those of the shareholders (Kothari, Shu, and Wysochi, 2009). Therefore, an increase in the threat of takeover can force managers to act in the best interests of shareholders because these managers fear they will lose their jobs and reputation in the event of a takeover (e.g., Lel and Miller, 2015; Martin and McConnell, 1991). Second, the increased threat of takeover can induce boards of directors to

[2] The use of a proxy for the threat of takeover, such as the mean level of takeover activity as in many studies, to study the effect of a takeover market on crash risk likely suffers from serious endogeneity problems because overall takeover activity is likely accompanied by macroeconomics shocks (Lel and Miller, 2015; Mikkelson and Patch, 1997) that jointly affect crash risk. As another example, the use of takeover defenses as a proxy for the threat of takeover to examine the effect of takeover markets on crash risk is also problematic because these provisions are established at the firm's discretion (Comment and Schwert, 1995; Gompers et al., 2003).

monitor management more closely because directors can also be replaced if the firm is targeted due to poor performance and governance (Hirshleifer and Thakor, 1998; Lel and Miller, 2015). To the extent that the enactment of M&A laws enhances managerial discipline by increasing the threat of takeover (e.g., Glendening, Khurana, and Wang, 2016; Lel and Miller, 2015),[3] managerial bad news hoarding behavior should be mitigated in the post-law periods. Hence, our first hypothesis predicts that the enactment of M&A laws leads to lower future crash risk. We call this view the *disciplinary* hypothesis.

By contrast, our alternative hypothesis proposes that the enactment of M&A laws leads to greater future crash risk. Our argument is based on the managerial myopia view of takeover threat, in the spirit of Stein (1988).[4] Specifically, an active market for corporate control prompted by the enactment of M&A laws can exacerbate managers' opportunistic behavior in bad news stockpiling. Such myopic behavior arises because managers fear that the immediate release of the bad news will result in significant stock price declines, making their firms more vulnerable to takeover threats and exposing themselves to potential losses in compensation, reputation, and career opportunities. Therefore, managers gamble on better future firm performance and bury bad news today. If accumulated over a prolonged period, bad news will eventually be released all at once to the market, causing price crashes. We call this view the *opportunistic* hypothesis.

To test these hypotheses, we employ the staggered initiation of M&A laws across countries as a quasi-natural experiment that generates a plausibly exogenous increase in the threat of

[3] Consistent with Glendening, Khurana, and Wang (2016) and Lel and Miller (2015), we find that merger intensity, defined as the number of M&A transactions of all firms divided by the total number of publicly listed firms in the country in a given year, increases significantly following the adoption of M&A laws. We present these results in Table A1 of the Internet Appendix.

[4] This view suggests that takeover pressure, and the accompanying fear of being bought out at an undervalued price, can induce mangers to sacrifice long-term interests in order to boost current profits.

takeover and construct a large sample of firms with crash risk information from 32 countries during the period 1992–2005.[5] Using an empirical design based on a difference-in-differences (DiD) estimation and conducting a battery of robustness tests, we find that firms in countries that adopted M&A laws (i.e., enacting countries) experience significant decreases in crash risk in the post-law periods. The decrease in crash risk is economically significant: after the enactment of M&A laws, firms in enacting countries experience a decrease of about 16.8% in crash risk relative to firms in non-enacting countries. These findings suggest that the exogenous increase in the threat of takeover prompted by the enactment of M&A laws has a disciplinary effect on managerial bad news hoarding behavior, leading to lower crash risk and thus supporting our disciplinary hypothesis.

Since a country's legal and information environment can affect corporate governance (La Porta et al., 2000) and crash risk (Jin and Myers, 2006), we further examine the interaction between country institutions and the effect of M&A laws on crash risk. If an active takeover market can restrain managerial bad news hoarding behavior and thus leads to lower future crash risk, then the effect of M&A law adoption on crash risk should be stronger in countries with poorer shareholder protection or weaker information environments. To test this conjecture, we use two measures of shareholder protection from La Porta et al. (1998), namely, civil law versus common law regimes and the efficiency of the judicial system, as well as two proxies for a country's information environment, namely, the disclosure score of Jin and Myers (2006) and the accounting standards of La Porta et al. (1998). We find that the disciplinary effect of M&A law adoption on crash risk is more pronounced for firms from civil law countries or from countries with a lower judicial

[5] We follow Glendening, Khurana, and Wang (2016) and restrict our sample period to 1992 to 2005 to allow for at least three years before and after the enactment of M&A laws. Other studies that exploit the same event, such as Lel and Miller (2015), restrict the sample to a period of 1992 through 2003.

system efficiency score. Similarly, it is stronger for firms domiciled in countries with a lower disclosure index score or accounting standards. Our findings suggest that the disciplinary effect of the market for corporate control on on crash risk is more pronounced in countries with a poorer institutional environment.

Besides a country's institutional environment, the effect of M&A law adoption on crash should differ between firms with a varying degree of external governance and information environment. To explore this issue, we following the literature (e.g., Aggarwal, Ferreira, and Ferreira, 2010; Edmans and Holderness, 2017; Giroud and Mueller, 2010; Shleifer and Vishy, 1997) and use institutional block ownership and product market competition as proxies for firm-level external governance and analyst coverage as a proxy for both firm-level external governance and the information environment (e.g., Brennan and Subramanyam, 1995; Irani and Oesch, 2016; Yu, 2008). We find that the effect of M&A law adoption on crash risk is attenuated for firms with greater institutional block ownership, firms operating in more competitive industries, and firms with greater analyst coverage. Our results suggest that while firm-level governance mechanisms and information environment can enhance managerial discipline, the external market for corporate control remains an effective mechanism for restraining managerial bad news hoarding and thus crash risk.

To obtain direct evidence on how the increased threat of takeover due to the adoption of M&A laws can mitigate future crash risk, in the final test we examine the effects of M&A law adoption on earnings management, an explicit form of bad news hoarding (Hutton, Marcus, and Tehranian, 2009). We find a significant decrease in earnings management after the passage of M&A laws, suggesting that the increased threat of takeover due to the passage of M&A laws can

be an effective external governance mechanism that prevents managers from bad news hoarding activities that would otherwise increase crash risk.

Our study contributes to the literature in two ways. First and to the best of our knowledge, this is a first attempt at documenting cross-country evidence of the effect of the market for corporate control on crash risk. Despite the preponderance of evidence on the determinants of crash risk, most of the studies focus on a single country, mainly the United States. To date, only a few cross-country studies have examined factors that affect crash risk, for example, the adoption of International Financial Reporting Standards (DeFond et al., 2015), the enactment of insider trading laws (Hu, Kim, and Zhang, 2015), the divergence of cash flow rights from voting rights (Hong, Kim, and Welker, 2017), and national culture (Dang et al., 2018). Our study extends this strand of the literature by documenting the first cross-country evidence on the governance roles of external markets for corporate control in restraining managerial bad news hoarding behavior, a precursor of crash risk.

Second, we contribute to a small but growing strand of the literature that exploits the enactment of M&A laws as an exogenous shock to the threat of takeover to examine the governance roles of the market for corporate control. Lel and Miller (2015) find that poorly performing firms experience more frequent takeovers and the propensity to replace poorly performing CEOs increases following the passage of M&A laws. Glendening, Khurana, and Wang (2016) find that the enactment of M&A laws mitigates agency problems between managers and shareholders by lessening the need for firms to convey their commitment to shareholders' interests through costly dividend payments. More recently, Khurana and Wang (2018) find that the threat of takeover increased by the adoption of M&A laws leads to greater accounting conservatism. We add to this line of research by providing cross-country evidence that the increased threat of

takeover prompted by the passage of M&A laws restrains managerial behavior in bad news stockpiling, thus leading to lower crash risk.

The remainder of the paper proceeds as follows. Section II describes the sample selection and variable construction. Section III discusses the baseline results. Section IV examines the roles of a country's institutional environment. Section V explores the roles of firm-level external governance mechanisms and the information environment. Section VI examines the effect of M&A law adoption on earnings management. Section VII concludes the paper.

II. Data and Variables

A. Sample

We obtain data on the staggered initiation of M&A laws around the world from Lel and Miller (2015), who collect information on these takeover acts from various sources, such as financial law publications (e.g., *International Comparative Legal Guide*, *International Financial Law*), the websites of national regulatory agencies, and studies (e.g., Nenova, 2006). To ensure that confounding influences related to other laws do not drive our results, we follow Glendening, Khurana, and Wang (2016) and Lel and Miller (2015) and restrict our sample to the period from 1992 to 2005, thus allowing for at least three years of data for both the pre-law and post-law periods. The sample period ends in 2005 because the implementation of the European Union Takeover Directive in April 2004 makes it more ambiguous to determine which takeover laws are applicable across countries. Further, we exclude countries that passed M&A laws prior to the beginning of the sample period, because there is no pre-law period for these countries.[6]

[6] For example, Australia passed the Foreign Acquisitions and Takeovers Act in 1975, but we do not have data for three years before and after 1975, so we exclude Australia from our sample.

We collect data on the weekly total return indexes for the universe of non-U.S. stocks from Datastream. We apply standard filters commonly used in the literature (e.g., Hutton et al. 2009; Kim et al., 2011b, Jin and Myers, 2006) and exclude firms with fewer than 26 weeks of stock trading data in a given year, financial and utility firms, American Depository Receipts, and Global Depository Receipts. We exclude any country for a year if it has fewer than 25 stocks with valid data that year.

We obtain firm and country characteristics data from Worldscope, I/B/E/S, Thomson Reuters, the World Bank, and several studies (e.g., Jin and Myers, 2006; La Porta et al., 1998). We exclude firm–years with negative sales or missing total assets (Fernandes and Ferreira, 2009) and require that all observations not be missing values for firm- and country-level control variables or crash risk measures. To mitigate the potential influence of outliers, we winsorize all continuous firm-level variables at the top and bottom 1% of the sample distribution. Our final sample includes firms from 12 countries that passed M&A laws for the first time (i.e., enacting countries) and 21 countries that never adopted these laws (i.e., non-enacting countries) from 1992 to 2005. The final sample contains 76,775 firm–year observations of 12,080 firms from 32 countries for the period from 1992 to 2005.

B. Crash Risk Measures

To construct crash risk variables, we follow prior literature (e.g., Hutton, Marcus, and Tehranian, 2009; Jin and Myers, 2006; Kim, Wang, and Zhang, 2015) and estimate firm-specific weekly returns from the following expanded market model:

$$r_{ijt} = \alpha + \beta_1 r_{mjt} + \beta_2 (r_{\mathrm{US}t} + EX_{jt}) + \beta_3 r_{mjt-1} + \beta_4 (r_{\mathrm{US}t-1} + EX_{jt-1}) + \beta_5 r_{mjt-2} + \beta_6 (r_{\mathrm{US}t-2} + EX_{jt-2}) + \beta_7 r_{mjt+1} + \beta_8 (r_{\mathrm{US}t+1} + EX_{jt+1}) + \beta_9 r_{mjt+2} + \beta_{10} (r_{\mathrm{US}t+2} + EX_{jt+2}) + \varepsilon_{ijt,} \quad (1)$$

where r_{ijt} is the total return index for stock *i* in week *t* in country *j*; r_{mjt} is the return on the local market index, calculated as the equally weighted average of all weekly individual stock returns (excluding stock *i*); $r_{\mathrm{US}t}$ is the U.S. market index return, commonly used as a proxy for the global market (Jin and Myers, 2006); and EX_{jt} is the change in country *j*'s exchange rate versus the U.S. dollar. The term $r_{\mathrm{US}\tau} + EX_{jt}$ translates U.S. market returns into local currency units. To correct for nonsynchronous trading, we follow Dimson (1979) and include two lead and lag terms for the local and U.S. market indexes.

A firm-specific weekly return for firm *i* in week *t* (in country *j*), denoted as W_{ijt}, is defined as the natural logarithm of one plus the residual return estimated from Equation (1), that is, W_{ijt} = ln(1+ $\hat{\varepsilon}_{ijt}$).[7] As in prior literature (e.g., Chen, Hong, and Stein, 2001; DeFond et al., 2015; Jin and Myers, 2006), we use the following two measures of crash risk, *NCSKEW* and *DUVOL*, in our main analysis.

Our first measure, *NCSKEW*, is defined as the negative of the third moments of the firm-specific weekly returns of each firm in each year normalized by the standard deviation of firm-specific weekly returns raised to the third power. Thus, for each stock *i* over any fiscal year *t*, we have

[7] This way of defining firm-specific returns ensures that crash risk measures reflect firm-specific factors rather than broad market movements, that is, the return not explained by local and U.S. markets.

$$NCSKEW_{it} = -\frac{n(n-1)^{3/2}\sum\left(W_{ijt}-\overline{W}_{ijt}\right)^3}{(n-1)(n-2)\left[\sum\left(W_{ijt}-\overline{W}_{ijt}\right)^2\right]^{3/2}}, \quad (2)$$

where W_{ijt} is the firm-specific weekly return, $\overline{W}_{ijt}$ is the average firm-specific return over fiscal year *t*, and *n* is the number of observations in year *t*. The minus sign in front of the whole term on the right-hand side ensures that a higher value of *NCSKEW* corresponds to a stock being more crash prone, that is, having a more left-skewed distribution.

Our second measure of crash risk is down-to-up volatility (*DUVOL*). To construct this measure for each firm *i* over a fiscal year *t*, we first separate firm-specific weekly returns into two groups, where down (up) weeks are weeks whose returns are below (above) the annual mean. We then calculate the standard deviation of firm-specific weekly returns separately for these groups. For each firm *i* over a fiscal year *t*, *DUVOL* is calculated as the natural logarithm of the ratio of the standard deviation of firm-specific down weekly returns to the standard deviation of up weekly returns during the fiscal year. Specifically, for each firm *i* over a fiscal year *t*, *DUVOL* is computed as follows:

$$DUVOL_{it} = ln\left[\frac{(n_u-1)\sum_{DOWN}\left(W_{ijt}-\overline{W}_{ijt}\right)^2}{(n_d-1)\sum_{UP}\left(W_{ijt}-\overline{W}_{ijt}\right)^2}\right], \quad (3)$$

where n_d (n_u) is the number of down (up) weeks. A higher value of *DUVOL* indicates greater crash risk.

Besides these proxies for crash risk, in robustness tests we also use a third measure, *COUNT*, from Jin and Myers (2001). This measure is the frequency of crashes, defined as the difference between the number of crash weeks and the number of jumps weeks within a given

year. A week is a crash (jump) if the firm-specific weekly return is 3.09 standard deviations below (above) the annual mean, with 3.09 chosen to generate a frequency of 0.1% in the normal distribution.[8]

C. Firm-Level Control Variables

Following prior literature (e.g., Jin and Myers, 2006; Hutton, Marcus, and Tehranian, 2009; DeFond et al., 2015), our control variables, all lagged by one year relative to the dependent variables, include financial reporting opacity (*DISACC*), defined as the three-year moving sum of the absolute values of discretionary annual accruals; detrended stock turnover (*DTURN*), defined as the change in average monthly stock turnover over a fiscal year; the lagged negative conditional skewness of firm-specific weekly returns (*LNCSKEW*); the standard deviation of firm-specific weekly returns over the last fiscal year (*SIGMA*); the average of firm-specific weekly returns over the fiscal year (*RET*); firm size (*SIZE*); the market-to-book ratio (*MTB*); financial leverage (*LEV*); and the return on assets (*ROA*). All these variables are described in detail in the Appendix.

D. Country-Level Control Variables

Following the literature (Bhattacharya and Daouk, 2002; Kaufmann, Kraay, and Mastruzzi, 2011; Kim and Lu, 2011), we control for country characteristics potentially related to crash risk. First, we incorporate the government effectiveness (*GOVEFF*) measure of Kaufmann, Kraay, and Mastruzzi (2011), which captures perceptions of the quality of public services, the quality of civil services, and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such

[8] We follow Hutton et al. (2009) and use 3.09 standard deviations below the average firm-specific weekly returns over the entire fiscal year as a benchmark to define extremely negative returns.

policies. In addition, we control for growth in the gross domestic product (*GDPG*), which captures a country's macroeconomic conditions. We also control for the size of a country's stock market (*STMCAP*), which is the country's stock market capitalization divided by its GDP. These variables are described in detail in the Appendix.

E. Descriptive Statistics

Table 1 provides a country-wise breakdown of our sample and M&A law adoption years for enacting countries. The sample includes 12 countries that initiated M&A laws and 21 countries that never adopted these laws between 1992 and 2005. Japan has by far the largest number of firm–year observations among the non-enacting countries, followed by France, South Korea, and China; among enacting countries, Malaysia has the largest number, followed by Taiwan, India, and Germany. As for the number of firms, Japan again dominates the entire sample, followed by China and Taiwan. The average value of crash risk measures by country ranges from -0.539 (Venezuela) to 0.020 (Ireland) for *NCSKEW* and from -0.297 (Turkey) to -0.005 (Ireland) for *DUVOL*. The average of *NCSKEW* (*DUVOL*) over the whole sample is -0.278 (-0.157). In total, there are 76,775 firm–year observations for 12,080 unique firms from 32 countries.

[Insert Table 1 here]

Since our study assumes that the staggered adoption of M&A laws increases the threat of takeover, as documented by Glendening, Khurana and Wang (2016) and Lel and Miller (2015), we reconfirm this evidence by showing that M&A activities increase significantly following the enactment of M&A laws. Specifically, we construct a merger intensity variable, defined as the number of M&A transactions of all firms divided by the total number of publicly listed firms in

the country in a given year. We show that merger intensity significantly increases following the enactment of M&A laws and we report these results in Table A1 of the Internet Appendix.

Table 2 provides descriptive statistics separately for firms from enacting and non-enacting countries. Panel A shows the statistics for firms domiciled in enacting countries. In this subsample, there are 19,514 firm–year observations across all firm- and country-level variables, except for *FIO*, which is different because Thomson Reuters institutional ownership data are available since 1997 only. The mean value of *NCSKEW* (*DUVOL*) in this subsample is -0.328 (-0.184). On average, a firm has an *ROA* value of 1.70%, is covered by about two financial analysts, has a market value of about US$60 million (i.e., the natural logarithm of market capitalization, or *SIZE*, is 17.918), and has a market-to-book ratio of 1.778. Panel B presents descriptive statistics for firms from non-enacting countries. Compared to firms in enacting countries, most of the firms in this subsample are larger, as indicated by a mean market value of about US$108 million (i.e., the natural logarithm of market capitalization is 18.568) and greater institutional block ownership but they have similar analyst coverage. Non-enacting countries appear to have stronger government effectiveness than enacting countries, as indicated by the higher mean and median values of government effectiveness index (*GOVEFF*) for non-enacting countries than enacting countries.

[Insert Table 2 here]

III. Results and Discussions

A. Univariate Analysis

Table 3 reports a univariate DiD test in which we compare changes in crash risk as measured by *NCSKEW* and *DUVOL* around the passage of M&A laws for firms in enacting and non-enacting countries. For enacting countries, the event year is the year in which the M&A law

was adopted. For non-acting countries, however, there are no event years since M&A laws are never passed in these countries during the sample period. As a result, to facilitate the analysis, we follow Glendening, Khurana, and Wang (2016) and assign 1999, the median year of M&A law enactments among the enacting countries, as the pseudo-event year. While both enacting and non-enacting countries generally experience a decline in crash risk following the passage of M&A laws, this decrease is significantly larger for enacting countries, providing initial support for our main hypothesis that M&A law adoption leads to lower future crash risk in firms from enacting countries relative to those from non-enacting countries.

[Insert Table 3 here]

B. Baseline Regressions

To examine the effect of M&A law adoption on stock price crash risk, we estimate the following DiD regression model:

$$CRASH\_RISK_{ijt} = \alpha + \beta_1 POST\_MA_{jt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt}, \quad (4)$$

where *i*, *j*, *k*, and *t* refer to the firm, country, industry, and year, respectively. The dependent variable, *CRASH_RISK*, is measured by either *NCSKEW* or *DUVOL*; *POST_MA* is a dummy variable that equals one if M&A laws were passed by year *t* in country *j* and zero otherwise; and *CONTROL* is a vector of firm and country characteristics as described in Sections II.C and II.D, respectively, all lagged by one year relative to the dependent variable. Detailed variable definitions are provided in the Appendix. We include year fixed effects (ϕ), industry fixed effects (ψ), and country fixed effects (γ). In all the regressions, we report *t*-statistics in parentheses, based on robust standard errors clustered at the firm level.

The coefficient estimate of *POST_MA* is the DiD estimator that captures the causal effect of the enactment of M&A laws on stock price crash risk: if its coefficient (β_1) is positive (negative) and statistically significant, then we find support for the positive (negative) effect of the enactment of M&A laws on stock price crash risk.

[Insert Table 4 here]

Table 4 reports the regression results for Equation (4). Column (1) reports the results where crash risk is measured by *NCSKEW*. We find that the coefficient estimate of *POST_MA* is negative and strongly significant at the 1% level, suggesting that firms from enacting countries experience lower crash risk in the post-law period relative to those from non-enacting countries. The magnitude of the coefficient estimate is economically significant as well. A coefficient estimate of -0.055 in Column (1) indicates that, after the enactment of M&A laws, firms in enacting countries experience a decrease of about 16.8% (= 0.055/0.328) in crash risk, on average, relative to their mean value of *NCSKEW*. In Column (2), where crash risk is measured by *DUVOL*, we continue to find qualitatively similar results, suggesting that our results for the effect of M&A law adoption on crash risk are not driven by the choice of a specific measure of crash risk. These results suggest that the enactment of M&A laws, which increases the threat of takeover in the market for corporate control, exerts a disciplinary effect on managerial behavior in bad news stockpiling, thus resulting in lower future crash risk.

Turning to other control variables, we find that firms with higher past returns (*RET*), more severe financial report opacity (*DISACC*), a higher market-to-book ratio (*MTB*), larger size (*SIZE*), or lower past returns on assets (*ROA*) are more likely to crash in the future. These results are consistent with prior literature (e.g., Kim, Li, and Zhang, 2011a). We also find that firms from

countries with higher GDP growth rates and larger stock markets are associated with lower future crash risk.

Overall, this section provides strong support for our disciplinary hypothesis that the enactment of M&A laws has a negative effect on crash risk, implying that the increased threat of takeover prompted by the adoption of M&A laws has the effect of restraining managerial opportunistic behavior in bad news hoarding that is a precursor to price crashes.

C. Confounding Channel and Falsification Tests

To mitigate the concern that the enactment of M&A laws could coincide with other country-level institutional changes that would independently affect crash risk, we follow Lel and Miller (2015) and control for several country-level variables. We use corporate governance laws (*CORPGOV*), from Kim and Lu (2013). If a country passes a corporate governance reform either on a mandatory or comply-or-explain basis, we assign a value of one to the period following the passage of the law onward, and zero otherwise. We use insider trading laws (*INSIDER*), from Bhattacharya and Daouk (2002), which takes the value of one from the year of the introduction of the insider trading law, and zero otherwise. We use short-selling laws (*SHORT*), from Jain *et al*. (2013), which equals one for the period from the year of the introduction of the short-selling law, and zero otherwise. Following Abiad, Detragiache, and Tressel (2008), we use the financial reform index (*FINREFORM*) as a proxy for the multidimensional nature of financial reforms.

[Insert Table 5 here]

Panel A of Table 5 reports the results for the test of potential confounding channels. For brevity, we report only the results for the variables of interest. As shown in Columns (1) to (10), the coefficient estimates of *POST_MA* are all negative and strongly statistically significant,

regardless of whether crash risk is measured by *NCSKEW* or *DUVOL*. These results suggest that our baseline results documented so far are not simply driven by country-level institutional changes that independently affect crash risk. For instance, in Column (5), where we control for all country-level changes, the coefficient estimate of *POST_MA* remains negative and strongly significant, suggesting that the effects of M&A laws on crash risk are not subdued by such changes in a country's legal and macroeconomic environments. Further, we find that the adoption of insider trading laws is negatively associated with crash risk, which is consistent with the literature (e.g., Hu, Kim, and Wang, 2015). Short-selling laws are positively associated with crash risk, while financial reforms are negatively associated with crash risk. Overall, these tests show that our results for the negative effect of M&A law enactment on crash risk still hold after controlling for potential country-level confounders.

Our analyses are based on the DiD methods which compare changes in crash risk between firms in countries that adopt M&A laws and those in countries that do not. To verify that our results are consistent with the parallel assumption of the DiD method,[9] we follow Bertrand and Mullainath (2003) and re-estimate the baseline regression but replace *POST_MA* with several time dummy variables: *BEFORE*(*-1*) is a dummy variable that equals one if M&A laws will be adopted next year and zero otherwise, *CURRENT*(*0*) is a dummy variable that equals one if M&A laws are adopted that year and zero otherwise, *AFTER*(*+1*) is a dummy variable that equals one if M&A laws were adopted one year ago and zero otherwise, *AFTER(+2*) is a dummy variable that equals one if M&A laws were adopted two years ago and zero otherwise, *AFTER*(*+3*) is a dummy variable

[9] The parallel assumption, which is the key identifying assumption of the DiD approach, requires that, in the absence of treatment, the average change in the outcome variable would have been the same for both the treatment and control groups.

that equals one if M&A laws were adopted three years ago and zero otherwise. We summarize the regression results in Panel B of Table 5. We find that while the coefficient estimates on *BEFORE*(*-1*) are insignificant, the coefficient estimates on the other dummy variables are negative and statistically significant, implying that our results do not violate the parallel assumption.

D. Alternative Proxy for Crash Risk, Firm Fixed Effects, and Antitrust Laws

To address the concern that our results hold only for the choice of a particular proxy for crash risk, we follow Jin and Myers (2006) and use the frequency of crashes (*COUNT*) as an alternative measure of crash risk. This variable is defined as the number of crash weeks minus the number of jump weeks over a given year, whereby a week is defined as a crash (jump) week if the firm-specific weekly return is 3.09 standard deviations below (above) its annual mean. We then re-estimate Equation (4) and report the summary of the regression results in Column (1) of Panel A of Table 6. We find that the coefficient estimates of *POST_MA* are negative and statistically significant, suggesting again that our baseline results for the negative effect of the enactment of M&A laws are robust to the use of alternative crash risk measures.

[Insert Table 6 here]

To ensure that our results are robust to the inclusion of time-invariant unobservable firm-level characteristics that could affect crash risk, we re-estimate Equation (4) and include firm fixed effects (and drop industry and country fixed effects, since they do not vary within a firm). We report the summary of the regression results in Columns (2) to (4) in Panel A of Table 6. Again, we find that the coefficient estimates of *POST_MA* remain negative and highly significant at the 1% level, suggesting that the effect of M&A law adoption is unlikely to be driven by time-invariant unobservable firm characteristics.

In addition, we follow Lel and Miller (2015) and explore antitrust laws as an alternative proxy for an increase in the threat of takeover. Bris, Cabolis, and Janowski (2010) find that countries that adopt the antitrust laws for the first time experience an increase in aggregate takeover activity, because such laws promote M&A laws by removing barriers to M&A transactions and reducing information asymmetry. We create an indicator variable, *POST_ANTITRUST*, for whether a firm–year observation from a country that adopted an antitrust law belongs in the post-antitrust law periods, including the year in which the law was passed. We re-estimate Equation (4) and report the results in Panel B of Table 6. In Columns (1) and (3), we find that the coefficients of *POST_ANTITRUST* are negative and statistically significant at the 10% level, suggesting that the increased threat of takeover has a negative effect on crash risk.[10] In Columns (2) and (4), where we include both our key variables of interest, that is, the passage of M&A laws (*POST_MA*) and antitrust laws (*POST_ANTITRUST*), we find the coefficient estimates of *POST_MA* remain negative and strongly significant, confirming that our baseline results are robust to the inclusion of the passage of antitrust laws.

E. Additional Robustness Tests

We conduct two additional tests to ascertain that our results are robust. First, we examine whether our results are robust to regressions using only enacting countries. We re-estimate the baseline regression model using 19,514 firm–year observations of firms from 12 countries that enacted M&A laws during the sample period. We find that the coefficient estimates for *POST_MA* remain negative and statistically significant, suggesting that the firms from enacting countries have lower crash risk in the post-enactment period relative to the pre-enactment period. For brevity, we

[10] When using *COUNT* as an alternative measure of crash risk, we find that crash risk is mitigated after the enactment of the antitrust laws. We present these results in Table A2 of the Internet Appendix.

report all the results in Table A3 of the Internet Appendix. Second, we exclude several countries that dominate the sample in terms of both the number of firm–year observations and the number of firms, such as Japan, to verify that our results are not driven by a specific country. We find that the coefficients of *POST_MA* remain negative and strongly significant in all the model specifications. We report these results in Table A4 of the Internet Appendix. Overall, our robustness tests reinforce our conclusion that the staggered initiation of M&A laws leads to lower future crash risk.

IV. Country Institutional Environment and the Effects of M&A Laws on Crash Risk

A. Investor Protection Environment

In this section, we examine whether the effect of M&A law enactment on crash risk across firms varies with the degree of country-level investor protection. The basic premise of our story so far is that the adoption of M&A laws increases the threat of takeover, which serves as an effective governance mechanism that aligns the interests of managers with those of external shareholders and therefore deters managerial behavior in stockpiling bad news that can lead to future crash risk. The effectiveness of the M&A laws, however, should depend on a country's legal and institutional characteristics. Specifically, if the enactment of M&A laws leads to lower future crash risk, then this disciplinary effect of the enactment of M&A laws on crash risk should be more pronounced in countries with a weaker shareholder protection environment.

To test this hypothesis, we follow prior literature (e.g., Glendening, Khurana, and Wang, 2016; Lel and Miller, 2015; Leuz, Lins, and Warnock, 2010) and split our sample into two subsamples based on two measures of country-level investor protection. The first measure, from La Porta et al. (1998), indicates whether a country has a civil law or a common law tradition. La

Porta et al. (1998) find that common law and civil law countries differ significantly in disclosure, liability standards, and public enforcement such that countries whose legal systems are based on English common law have the strongest protection of external shareholders. The second measure is the strength of a country's legal enforcement, measured as the index of the efficiency of the judicial system from La Porta et al. (1998). This index captures the efficiency and integrity of the legal environment. A higher index value for the efficiency of the judicial system is associated with stronger shareholder protection.

[Insert Table 7 here]

We re-estimate Equation (4) using subsamples based on these two measures of investor protection at the country level and present the results in Table 7. Columns (1) to (4) show the results for the civil law and common law subsamples. We find that the coefficient estimates of *POST_MA* are negative and statistically significant in the subsample of civil law countries only, whereas they are insignificant in the subsample of firms from countries with a common law tradition. These results are consistent with the view that the disciplinary effect of the adoption of M&A law on crash risk is more evident in countries with weaker shareholder protection regimes.

In Columns (5) to (8) of Table 7, we examine the effects of M&A law enactment on crash risk across firms, conditioning on the strength of legal enforcement, measured by the efficiency of the judicial system. The High (Low) subsample contains countries that exhibit a value for the judicial system efficiency index of La Porta et al. (1998) that is above (below) the median of the sample countries. We find that the coefficient estimates of *POST_MA* are negative and statistically significant (insignificant) for the subsample of firms from countries with a low (high) level of judicial system efficiency, supporting our hypothesis that the disciplinary effect of the adoption of

M&A laws on crash risk is stronger for firms located in countries with a weaker shareholder protection environment.

B. Information Environment

The agency theory of Jin and Myers (2006) suggests that firms from a country with an opaque information environment experience more frequent crashes in firm-specific returns. We therefore expect that the disciplinary effect of M&A law adoption on crash risk should be stronger in countries with a poor information environment. To test this hypothesis, we follow Jin and Myers and use two measures for the country-level information environment. First, we use the disclosure score (*Disclosure Index*). Disclosure data are collected from surveys about the level and effectiveness of financial disclosure in different countries from the Global Competitiveness Reports for 1999 and 2000. A high value of *Disclosure Index* suggests a more transparent information environment. Second, we use the accounting standard index of La Porta et al. (1998). These authors have created an index of accounting standards (*Accounting Standards*) based on a list of 90 specific accounting items that could be reported in 1990 annual reports for a sample of companies. The more items reported, the higher the *Accounting Standards* score.

[Insert Table 8 here]

We re-estimate Equation (4) using subsamples based on these two measures of investor protection at the country level and present the results in Table 8.[11] Panel A reports the results for *Disclosure Index* while Panel B reports the results for *Accounting Standards*. The High (Low) subsample contains countries that exhibit a value for the disclosure score of Jin and Myers (2006)

[11] La Porta et al. (1998) and Jin and Myers (2006) do not cover several countries in our sample, so the number of firm–year observations in this sample is smaller than in the main sample.

or the accounting standards of La Porta et al. (1998) that is above (below) the median of the sample countries.

Columns (1) to (4) of Table 8 show the results for the subsamples based on *Disclosure Index*. We find that the coefficient estimates of *POST_MA* are negative and highly significant at the 1% level only for the subsample of firms with low disclosure scores, whereas they are insignificant for the subsample with high disclosure scores. These results suggest that the disciplinary effect of the adoption of M&A laws on crash risk is more pronounced in countries with a poor information environment. Similarly, in Columns (5) to (8), where we report the results for subsamples of firms with high versus low accounting standards, we again find that the coefficient estimates of *POST_MA* are negative and strongly significant for the subsample of firms with low levels of accounting standards only, supporting our hypothesis that the disciplinary effect of M&A law adoption on crash risk exists only for firms from a poor information environment.

V. External Firm-Level Monitoring and the Information Environment

In this section, we examine whether the effect of M&A law enactment on crash risk across firms varies with the strength of external monitoring and the quality of information environment at the firm level. If the increased threat of takeover resulting from the enactment of M&A laws leads to lower future crash risk, then the extent to which it affects crash risk should differ among firms exposed to the varying degree of firm-level external monitoring and quality of information environments. Specifically, if the enactment of M&A laws leads to lower future crash risk by curbing managerial bad news hoarding behavior, then this effect should be attenuated for firms with stronger external monitoring and a better information environment.

To test this hypothesis, we use three proxies for external governance and information environments, namely, institutional block ownership (*BIO*), product market competition (*HHI*), and financial analyst coverage (*ANALYST*). First, we use foreign institutional ownership because institutional blockholders play an important role in promoting changes in corporate governance (Aggarwal et al., 2011; Edmans and Holderness, 2017). The variable *BIO* is calculated as the percentage of shares held by institutional blockholders who own at least 5% of a firm's total number of shares outstanding in a given year.[12] Second, we use product market competition because prior literature (e.g., Giroud and Mueller, 2010; Jensen, 1986; Li and Zhan, 2018; Shleifer and Vishy, 1997) has shown that product market competition as an external governance mechanism is effective in disciplining managers and lowering agency costs. The variable *HHI* is calculated as one minus the sum of firms' squared market shares at the country–industry–year level. A higher value of *HHI* corresponds to stronger competition. Finally, we use analyst coverage

[12] Thomson Reuters data on *BIO* are available from 1997 onward only.

(*ANALYST*) because greater analyst coverage improves a firm's information environment and mitigates the severity of information asymmetry (e.g., Brennan and Subramanyam, 1995). However, empirical evidence on the monitoring role of financial analyst coverage remains controversial. On the one hand, the agency view (e.g., Irani and Oesch, 2013; Kothari, Shu, and Wysocki, 2009; Yu, 2008) suggests that, by reducing information asymmetry between managers and shareholders, financial analysts can detect and prevent managerial bad news hoarding activities, thus reducing the likelihood of price crashes. On the other hand, the managerial myopia view (e.g., He and Tian, 2013; Irani and Oesch, 2016) argues that greater analyst coverage imposes greater pressure on managers to focus on short-term firm performance, which, in turn, gives them stronger incentives to engage in opportunistic behavior in bad news stockpiling, thereby leading to higher crash risk.

Using these three proxies for external governance and the information environment, we estimate the following panel regression model:

$$CRASH\_RISK_{ijt} = \beta_0 + \beta_1 POST\_MA_{jt} + \beta_2\left(POST\_MA_{jt} \times FGOV_{ijt}\right) + \beta_3 FGOV_{ijt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt}, \quad (5)$$

where $FGOV_{ijt}$ refers to either *BIO*, *HHI*, or *ANALYST*. All the other variables are the same as in Equation (4). In this specification, the interaction term *POST_MA*×*FGOV* captures the effect of the enactment of M&A laws on crash risk, conditioning on external firm-level governance and the information environment.

[Insert Table 9 here]

Table 9 reports the regression results for Equation (5). As shown in Column (1) and (5), where we measure crash risk by *NCSKEW* and *DUVOL*, respectively, the coefficient estimate of

POST_MA remains negative and strongly significant while the interaction variable *POST_MA*×*BIO* displays a positive and strongly significant coefficient. These results suggest that the effect of M&A law enactment on crash risk is attenuated for firms with greater institutional block ownership. However, the coefficient estimates for *BIO* are negative but insignificant. In Column (2), where we use product market competition (*HHI*) as a proxy for external governance, the results for *POST_MA* still hold as expected while the coefficient estimate of *POST_MA*×*HHI* is positive and significant at the 10% level, supporting our hypothesis that the effect of M&A law enactment on crash risk is weaker for firms operating in more competitive industries. In Columns (3) and (7), while *ANALYST* has a positive and strongly significant coefficient (at the 1% level) supporting the managerial myopia view as discussed earlier, the coefficient estimates of *POST_MA*×*ANALYST* are positive and highly statistically significant, suggesting that the effect of M&A law enactment on crash risk is weaker for firms with greater analyst coverage.

In Columns (4) and (8) of Table 9, where we control for all of these three proxies together, the results are mixed. The significance of *POST_MA*×*BIO* disappears, as shown in Column (4), but remains at the marginal 10% level, as shown in Column (7). The term *POST_MA*×*HHI* remains significant at the 1% level, as shown in Column (4), and at the 5% level, as in Column (7). Similarly, the results of *POST_MA*×*ANALYST* are more consistent, as shown in both columns. Overall, the results provided in this section provide support that the disciplinary effect of M&A law adoption on managerial bad news hoarding and hence crash risk is attenuated for firms with better firm-level monitoring and a better information environment.

VI. M&A Laws and Earnings Management

Our results so far suggest that the enactment of M&A laws discourages the bad news hoarding behavior of managers, leading to lower future crash risk. To provide direct evidence of how such legislation affects future crash risk, we examine its effects on earnings management, an explicit form of bad news hoarding activity. Hutton, Marcus, and Tehranian (2009) find that firms with greater earnings management face greater future crash risk. If the adoption of M&A laws leads to lower future crash risk through the incentives it creates to monitor and discipline firm managers, the increased threat of takeover due to the passage of M&A laws should be associated with lower levels of earnings management.

To test this hypothesis, we follow prior literature (Dechow, Sloan, and Sweeney, 1996; Fang et al., 2016; Hutton, Marcus, and Tehranian, 2009; Massa et al., 2015) and use discretionary annual accruals (*DA*) and marginally beating past earnings (*BEAT_ROA*) as measures of earnings management. The variable *DA* is the difference between total accruals and fitted normal accruals, derived from Dechow, Sloan and Sweeney's (1996) modification of Jones's (1991) model. The variable *BEAT_ROA* is a dummy that equals one if the change in net income scaled by lagged total assets is positive and lies between 0% and 1%. We re-estimate Equation (4) but replace crash risk measures with earnings management proxies and report the results in Table 10.

[Insert Table 10 here]

As Table 10 shows, the coefficients on *POST_MA* are negative and strongly significant at the 1% level in both Columns (1) and (2). These results suggest that, following the enactment of M&A laws, firms in enacting countries engage less in earnings management relative to firms in non-enacting countries. These results also imply that the passage of M&A laws leads to lower

future crash risk through the incentives it creates to curb the opportunistic behavior of managers, namely, earnings manipulation, which is an explicit form of bad news hoarding.

VII. Conclusions

This study exploits an exogenous shock to the threat of takeover due to the passage of M&A laws across countries to examine whether the market for corporate control affects crash risk. Using a global sample of firms from 32 countries during the period of 1992–2005 and a DiD estimation approach, we find that crash risk significantly decreases after the enactment of M&A laws. This result is robust to a battery of tests, including confounding channel and falsification tests and the use of an alternative proxy for both crash risk and the threat of takeover. Our results suggest that an active takeover market due to the passage of M&A laws, by enhancing managerial discipline, restrains managerial bad news hoarding activities, thus leading to lower future crash risk.

We further find that the effect of M&A laws on crash risk is more pronounced for firms in countries with weak shareholder protection and a poor information environment, implying a substitution effect between the governance roles of the market for corporate control and those of country-level institutional environments. When examining how firm-level governance mechanisms and the information environment influence the relation between M&A law enactment and crash risk, we find that the effect of M&A law adoption is attenuated for firms with greater analyst coverage, greater institutional block ownership, and stronger product market competition. To the best of our knowledge, this is the first cross-country study to document evidence of the governance roles of the market for corporate control in mitigating crash risk. Our findings are

significant because of the importance of crash risk in affecting investor welfare and in a broader context, the stability of financial markets and the global economy.

References

Abiad, A., Detragiache, E., Tressel, T., 2008. A New Database of Financial Reforms. IMF Staff Papers, Palgrave Macmillan 57.

Aggarwal, R., Erel, I., Ferreira, M., Matos, P., 2011. Does Governance Travel Around the World? Evidence from Institutional Investors. Journal of Financial Economics 100, 154-181.

An, H., Zhang, T., 2013. Stock Price Synchronicity, Crash Risk, and Institutional Investors. Journal of Corporate Finance 21, 1-15.

Andreou, P.C., Horton, J., Louca, C., 2016. Corporate Governance and Firm-Specific Stock Price Crashes. European Financial Management 22, 916-956.

Andreou, P.C., Louca, C., Petrou, A.P., 2017. CEO Age and Stock Price Crash Risk. Review of Finance 21, 1287-1325.

Ben-Nasr, H., Ghouma, H., 2018. Employee Welfare and Stock Price Crash Risk. Journal of Corporate Finance 48, 700-725.

Bertrand, M., Mullainathan, S., 2003. Enjoying the Quiet Life? Corporate Governance and Managerial Preferences. Journal of Political Economy 111, 1043-1075.

Bhattacharya, U., Daouk, H., 2002. The World Price of Insider Trading. Journal of Finance 57, 75-108.

Brennan, M.J., Subrahmanyam, A., 1995. Investment Analysis and Price Formation in Securities Markets. Journal of Financial Economics 38, 361-381.

Bris, A., C. Cabolis, and V. Janowski. 2010. The effect of merger laws on merger activity: international evidence. In International Mergers and Acquisitions Activity Since 1990: Quantitative Analysis of Recent Research, ed. Greg N. Gregoriou and Luc Renneboog. Elsevier.

Callen, J.L., Fang, X., 2015. Religion and Stock Price Crash Risk. Journal of Financial and

Quantitative Analysis 50, 169-195.

Chang, X., Chen, Y., Zolotoy, L., 2017. Stock Liquidity and Stock Price Crash Risk. Journal of Financial and Quantitative Analysis 52, 1605-1637.

Chen, J., Hong, H., Stein, J.C., 2001. Forecasting Crashes: Trading Volume, Past Returns, and Conditional Skewness in Stock Prices. Journal of Financial Economics 61, 345-381.

Comment, R., Schwert, G.W., 1995. Poison or Placebo? Evidence on the Deterrence and Wealth Effects of Modern Antitakeover Measures. Journal of Financial Economics 39, 3-43.

Dang, T.L., Faff, R., Luong, H., Nguyen, L., 2018. Individualistic Cultures and Crash Risk. European Financial Management, forthcoming.

Dechow, P.M., Sloan, R.G., Sweeney, A.P., 1996. Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC. Contemporary Accounting Research 13, 1-36.

DeFond, M.L., Hung, M., Li, S., Li, Y., 2015. Does Mandatory IFRS Adoption Affect Crash Risk? Accounting Review 90, 265-299.

Dimson, E., 1979. Risk Measurement When Shares Are Subject to Infrequent Trading. Journal of Financial Economics 7, 197-226.

Edmans, A., Holderness, C.G., 2017. Chapter 8 - Blockholders: A Survey of Theory and Evidence. in E.H. Benjamin and S.W. Michael (eds), The Handbook of the Economics of Corporate Governance. Volume 1, 541-636, North-Holland.

Fama, E.F., Jensen, M.C., 1983. Separation of Ownership and Control. Journal of Law & Economics 26, 301-325.

Fang, V.W., Huang, A.H., Karpoff, J.M., 2016. Short Selling and Earnings Management: A Controlled Experiment. Journal of Finance 71, 1251-1294.

Fernandes, N., Ferreira, M.A., 2009. Insider Trading Laws and Stock Price Informativeness. Review of Financial Studies 22, 1845-1887.

Glendening, M., Khurana, I.K., Wang, W., 2016. The Market for Corporate Control and Dividend Policies: Cross-Country Evidence from M&A laws. Journal of International Business Studies 47, 1106-1134.

Giroud, X., Mueller, H.M., 2011. Corporate Governance, Product Market Competition, and Equity Prices. Journal of Finance 66, 563-600.

Gompers, P., Ishii, J., Metrick, A., 2003. Corporate Governance and Equity Prices*. Quarterly Journal of Economics 118, 107-156.

He, J., Tian, X., 2013. The Dark Side of Analyst Coverage: The Case of Innovation. Journal of Financial Economics.

Hirshleifer, D., Thakor, A.V., 1998. Corporate Control Through Board Dismissals and Takeovers. Journal of Economics & Management Strategy 7, 489-520.

Hong, H.A., Kim, J.-B., Welker, M., 2017. Divergence of Cash Flow and Voting Rights, Opacity, and Stock Price Crash Risk: International Evidence. Journal of Accounting Research 55, 1167-1212.

Hu, J., Kim, J.-B., Zhang, W., 2015. Insider Trading and Stock Price Crashes: International Evidence from a Natural Experiment. Available at: https://ssrn.com/abstract=2359069.

Hutton, A.P., Marcus, A.J., Tehranian, H., 2009. Opaque Financial Reports, R2, and Crash Risk. Journal of Financial Economics 94, 67-86.

Irani, R.M., Oesch, D., 2013. Monitoring and Corporate Disclosure: Evidence from a Natural Experiment. Journal of Financial Economics 109, 398-418.

Irani, R.M., Oesch, D., 2016. Analyst Coverage and Real Earnings Management: Quasi-

experimental Evidence. Journal of Financial and Quantitative Analysis 51, 589-627.

Jain, A., Jain, P.K., McInish, T.H., McKenzie, M., 2013. Worldwide Reach of Short Selling Regulations. Journal of Financial Economics 109, 177-197.

Jensen, M.C., 1986. Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. American Economic Review 76, 323-329.

Jensen, M.C., Ruback, R.S., 1983. The Market for Corporate Control: The Scientific Evidence. Journal of Financial Economics 11, 5-50.

Jin, L., Myers, S.C., 2006. R2 around the World: New Theory and New Tests. Journal of Financial Economics 79, 257-292.

Kaufmann, D., Kraay, A., Mastruzzi, M., 2011. The Worldwide Governance Indicators: Methodology and Analytical Issues. Hague Journal on the Rule of Law 3, 220-246.

Khurana, I.K., Pereira, R., Zhang, E., 2018. Is Real Earnings Smoothing Harmful? Evidence from Firm- Specific Stock Price Crash Risk. Contemporary Accounting Research 35, 558-587.

Kim, E.H., Lu, Y., 2011. CEO Ownership, External Governance, and Risk-Taking. Journal of Financial Economics 102, 272-292.

Kim, E.H., Lu, Y., 2013. Corporate Governance Reforms around the World and Cross-Border Acquisitions. Journal of Corporate Finance 22, 236-253.

Kim, J.-B., Li, Y., Zhang, L., 2011a. CFOs versus CEOs: Equity incentives and crashes. Journal of Financial Economics 101, 713-730.

Kim, J.-B., Li, Y., Zhang, L., 2011b. Corporate Tax Avoidance and Stock Price Crash Risk: Firm-Level Analysis. Journal of Financial Economics 100, 639-662.

Kim, J.B., Wang, Z., Zhang, L., 2016. CEO Overconfidence and Stock Price Crash Risk. Contemporary Accounting Research 33, 1720-1749.

Kim, J.B., Zhang, L., 2016. Accounting Conservatism and Stock Price Crash Risk: Firm- level Evidence. Contemporary Accounting Research 33, 412-441.

Kothari, S.P., Shu, S., Wysocki, P.D., 2009. Do Managers Withhold Bad News? Journal of Accounting Research 47, 241-276.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2000. Investor Protection and Corporate Governance. Journal of Financial Economics 58, 3-27.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W., 1998. Law and Finance. Journal of Political Economy 106, 1113-1155.

Lel, U., Miller, D.P., 2015. Does Takeover Activity Cause Managerial Discipline? Evidence from International M&A Laws. Review of Financial Studies 28, 1588-1622.

Leuz, C., Lins, K.V., Warnock, F.E., 2010. Do Foreigners Invest Less in Poorly Governed Firms? (2009). Review of Financial Studies 23, 3245-3285.

Li, S., Zhan, X., 2018. Product Market Threats and Stock Crash Risk. Management Science, forthcoming.

Long, J.B.D., Shleifer, A., Summers, L.H., Waldmann, R.J., 1990. Positive Feedback Investment Strategies and Destabilizing Rational Speculation. Journal of Finance 45, 379-395.

Martin, K.J., McConnel, J.J., 1991. Corporate Performance, Corporate Takeovers, and Management Turnover. Journal of Finance 46, 671-687.

Massa, M., Qian, W., Xu, W., Zhang, H., 2015. Competition of the Informed: Does the Presence of Short Sellers Affect Insider Selling? Journal of Financial Economics 118, 268-288.

Mikkelson, W.H., Partch, M.M., 1997. The Decline of Takeovers and Disciplinary Managerial Turnover. Journal of Financial Economics 44, 205-228.

Nenova, T., 2012. Takeover Laws and Financial Development. World Banking Working Paper.

Robin, A.J., Zhang, H., 2015. Do Industry-Specialist Auditors Influence Stock Price Crash Risk? Auditing: A Journal of Practice and Theory 34, 47-79.

Shleifer, A., and R. W. Vishny. 1986. Large Shareholders and Corporate Control. Journal of Political Economy 94, 461–488.

Shleifer, A., Vishny, R.W., 1997. A Survey of Corporate Governance. Journal of Finance 52, 737-783.

Stein, J.C., 1988. Takeover Threats and Managerial Myopia. Journal of Political Economy 96, 61-80.

Yu, F., 2008. Analyst Coverage and Earnings Management. Journal of Financial Economics 88, 245-271.

Appendix - Variable Definition

Acronym	Description	Data source
Crash risk		
NCSKEW	Negative coefficient of skewness, calculated as the negative of the ratio of the third central moment of firm-specific weekly returns to the cubed sample variance (Chen, Hong and Stein, 2001), where a firm-specific weekly return is defined as the natural logarithm of one plus the residual estimated from the expanded market model as in Jin and Myers (2006)	Datastream
DUVOL	"Down-to-up" volatility, calculated as the natural logarithm of the ratio of the standard deviation of firm-specific weekly returns in down weeks to the standard deviation in up weeks, where down (up) weeks are weeks with firm-specific weekly returns below (above) the annual mean (Chen, Hong and Stein, 2001)	Datastream
COUNT	Crash frequency minus jump frequency, calculated as the number of crash weeks minus the number of jump weeks over a given year. A week is defined as a crash (jump) week if the firm-specific weekly return is 3.09 standard deviations below (above) its annual mean as in Jin and Myers (2006)	Datastream
Firm characteristics		
POST_MA	A dummy variable equal to one for firms in enacting countries in the post-M&A law periods and zero otherwise.	Lel and Miller (2015)
DISACC	The 3-year moving sum of the absolute value of annual discretionary accruals, where a firm's annual discretionary accruals are defined as the difference between its total accruals and the fitted normal accruals derived from a modified Jones model (Jones, 1991). The modified Jones model is based on (Dechow, Sloan and Sweeney, 1996) and specified as follows: $$\frac{TA_{it}}{Assets_{it-1}} = \alpha_0 \frac{1}{Assets_{it-1}} + \beta_1 \frac{\Delta \text{Sales}_{it}}{Assets_{it-1}} + \beta_2 \frac{PPE_{it}}{Assets_{it-1}} + \varepsilon_{it},$$ where i and t refer to firm and fiscal year, TA_{it} is total accruals during the fiscal year t, defined as earnings before extraordinary items and discontinued operations minus operating cash flows, $Assets_{it-1}$ is total assets at the end of the preceding fiscal year, $\Delta Sales_{it}$ is the change in sales revenue from the preceding year, PPE_{it} is the gross property, plant, and equipment for firm i at the end of the fiscal year t. The fitted normal accruals are estimated as	Worldscope

$$NA_{it} = \widehat{\alpha_0}\frac{1}{Assets_{it-1}} + \widehat{\beta_1}\frac{\Delta Sales_{it} - \Delta Receivables_{it}}{Assets_{it-1}} + \widehat{\beta_2}\frac{PPE_{it}}{Assets_{it-1}} + \varepsilon_{it}$$

Firm-year-specific annual discretionary accruals (*DA*) are then calculated as

$$DA_{i,t} = \frac{TA_{it}}{Assets_{it-1}} - NA_{it}$$

Finally, $DISACC_{it}$ is defined as

$$DISACC_{it} = \sum_{k=1}^{3} |DA_{it-k}|$$

DTURN	Detrended stock turnover, defined as the change in average monthly share turnover over the preceding year, where monthly share turnover is calculated as the monthly trading volume divided by the total number of shares outstanding during the month (Chen, Hong and Stein, 2001; Hutton, Marcus and Tehranian, 2009; Kim, Li and Zhang, 2011)	Datastream, Worldscope
SIGMA	The standard deviation of firm-specific weekly returns over the fiscal-year period	Datastream
RET	The mean of firm-specific weekly returns over the fiscal-year period	Datastream
SIZE	Firm size, defined as the natural logarithm of the market value of equity at the end of the fiscal year	Worldscope
MB	Market-to-book, defined as the ratio of the market value of equity to the book value of equity at the end of the fiscal year	Worldscope
LEV	Financial leverage, defined as the ratio of long-term debt to total assets at the end of the fiscal year	Worldscope
ROA	Return on assets, defined as the ratio of operating income to total assets at the end of the fiscal year	Worldscope
ANALYST	The natural logarithm of one plus the number of analysts following the firm in a fiscal year	I/B/E/S
BIO	The percentage of shares held by institutional blockholders who own at least 5% of a firm's total number of shares outstanding in a given year	Thomson Reuters
HHI	The Herfindahl-Hirschman Index	Worldscope
BEAT_ROA	A dummy equal to one if the change in net income scaled by lagged total assets is positive and lies between 0% and 1% and zero otherwise.	Worldscope

Country characteristics		
GDPG	Annual GDP growth	World Bank
STMCAP	The ratio of stock market capitalization to GDP	World Bank
GOVEFF	The government effectiveness indicator of Kaufmann, Kraay and Mastruzzi (2011), which captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies	Kaufmann, Kraay and Mastruzzi (2011)
CORPGOV	A binary variable indicating whether corporate governance laws are passed in a country. If a country passes a corporate governance reform either on a mandatory or comply-or-explain basis, this variable takes a value of one for the periods from the year of the reform, and zero otherwise.	Kim and Lu (2013)
INSIDER	A binary variable indicating whether insider-trading laws are adopted in a country, taking a value of one for the periods since the laws are passed and zero otherwise.	Bhattacharya and Daouk (2002)
SHORT	A dummy variable that equals one for the periods from the year of the introduction of the short-selling laws and zero otherwise.	Jain *et al*. (2013)
FINREFORM	The financial reform index as a proxy for the multidimensional nature of financial reforms.	Abiad, Detragiache, and Tressel (2008)
Disclosure Score	A measure of the level of financial disclosure and availability of information to investors, calculated using the survey results on the level and effectiveness of financial disclosure from the Annual Global Competitiveness Reports for 1999 and 2000 for 40 countries.	Jin and Myers (2006)
Accounting Standards	An index of accounting standards for 36 countries.	La Porta et al. (1998)

Table 1. Sample Distribution by Country

This table shows a country breakdown of crash risk measures, number of firms, and number of firm-year observations for a sample 12,080 non-U.S. unique firms from 32 countries over a period from 1992 through 2005. *M&A Law Year* is the enactment year of M&A laws. *#Obs.* is the number of observations. *#Firms* is the number of firms. *NCSKEW* (*DUVOL*) is the negative coefficient of skewness (down-to-up volatility) as defined in Chen, Hong and Stein (2001). The averages of *NCSKEW* and *DUVOL* are shown at the bottom row in the table.

Country	**M&A Law Year**	**#Obs.**	**#Firms**	***NCSKEW***	***DUVOL***
Argentina	None	436	62	-0.223	-0.125
Austria	1998	599	91	-0.204	-0.132
Brazil	None	1,486	259	-0.417	-0.225
Chile	2000	806	121	-0.435	-0.225
China	None	4,043	1,179	-0.258	-0.147
Columbia	None	153	24	-0.070	-0.060
Czech Republic	None	92	21	-0.217	-0.110
Germany	2002	2,687	623	-0.200	-0.118
Denmark	None	1,197	145	-0.207	-0.125
France	None	5,455	868	-0.217	-0.128
Greece	None	1,773	270	-0.321	-0.188
Hungary	None	157	22	-0.196	-0.142
Indonesia	1998	975	223	-0.287	-0.146
Ireland	1997	169	39	0.020	-0.005
India	1997	3,007	534	-0.405	-0.242
Japan	None	32,880	3,622	-0.191	-0.115
South Korea	None	4,938	874	-0.351	-0.208
Sri Lanka	1995	205	37	-0.410	-0.213
Luxembourg	None	59	15	-0.131	-0.044
Mexico	None	600	94	-0.242	-0.133
Malaysia	1998	4,714	784	-0.338	-0.178
Norway	None	1,084	179	-0.195	-0.123
New Zealand	2001	493	89	-0.203	-0.124
Peru	None	248	50	-0.152	-0.093
Philippines	1998	674	106	-0.277	-0.128
Pakistan	2000	669	89	-0.340	-0.173
Poland	None	484	117	-0.306	-0.183
Portugal	None	530	86	-0.348	-0.195
Thailand	None	545	146	-0.33	-0.189
Turkey	None	1,027	186	-0.523	-0.297
Taiwan	2002	4,516	1,111	-0.379	-0.222
Venezuela	None	74	14	-0.539	-0.283
Total		76,775	12,080	-0.278	-0.157

Table 2. Summary Statistics

This table shows descriptive statistics over the sample period of 1992-2005 for firms from M&A law enacting (Panel A) and non-enacting (Panel B) countries. Variable definitions are contained in Appendix.

Variable	#Obs.	Mean	Std.	P5	P25	Median	P75	P95
Panel A: Enacting countries								
NCSKEW	19,514	-0.328	0.703	-1.518	-0.706	-0.313	0.069	0.785
DUVOL	19,514	-0.184	0.359	-0.787	-0.411	-0.186	0.039	0.414
DISACC	19,514	0.219	0.211	0.000	0.083	0.162	0.284	0.645
DTURN	19,514	-0.001	0.122	-0.145	-0.012	0.000	0.009	0.144
SIGMA	19,514	0.050	0.019	0.021	0.036	0.048	0.062	0.088
RET	19,514	-0.001	0.007	-0.014	-0.006	-0.001	0.003	0.011
SIZE	19,514	17.918	1.768	15.011	16.713	17.834	19.088	20.963
MTB	19,514	1.778	2.158	0.163	0.659	1.166	2.134	5.384
LEV	19,514	0.259	0.206	0.000	0.079	0.242	0.392	0.631
ROA	19,514	0.017	0.117	-0.198	-0.001	0.033	0.074	0.165
ANALYST	19,514	0.677	0.919	0.000	0.000	0.000	1.099	2.639
BIO	17,211	1.308	3.421	0.000	0.000	0.000	0.546	8.107
GDPG	19,514	4.295	4.148	-1.545	2.804	4.736	7.323	9.382
STMCAP	19,514	81.374	58.900	13.877	32.995	77.575	120.082	150.435
GOVEFF	19,514	74.265	17.516	38.050	55.120	80.98	86.340	94.150
Panel B: Non-enacting countries								
NCSKEW	57,261	-0.233	0.627	-1.234	-0.575	-0.232	0.112	0.772
DUVOL	57,261	-0.137	0.334	-0.675	-0.345	-0.141	0.066	0.425
DISACC	57,261	0.168	0.177	0.014	0.061	0.111	0.207	0.520
DTURN	57,261	0.005	0.148	-0.126	-0.008	0.000	0.011	0.164
SIGMA	57,261	0.046	0.016	0.022	0.034	0.044	0.056	0.075
RET	57,261	-0.001	0.006	-0.012	-0.005	-0.001	0.002	0.009
SIZE	57,261	18.568	1.683	15.914	17.406	18.54	19.653	21.473
MTB	57,261	1.846	2.241	0.257	0.673	1.225	2.133	5.563
LEV	57,261	0.271	0.201	0.000	0.102	0.252	0.405	0.634
ROA	57,261	0.011	0.082	-0.106	0.002	0.016	0.041	0.103
ANALYST	57,261	0.689	0.852	0.000	0.000	0.000	1.099	2.485
BIO	44,817	1.730	6.568	0.000	0.000	0.000	1.059	7.931
GDPG	57,261	2.615	3.040	-0.934	0.819	1.957	3.407	9.644
STMCAP	57,261	56.254	24.332	14.284	41.166	57.849	66.427	97.660
GOVEFF	57,261	80.424	11.505	55.120	78.540	83.410	87.320	92.200

Table 3. Univariate Analysis of the Change in Crash Risk

This table presents a univariate difference-in-differences (DiD) analysis for crash risk around the passage of M&A laws between enacting and non-enacting countries, where the DiD estimators are highlighted in bold. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively, based on the *t*-test for the means of the two groups.

		Pre-law periods	Post-law periods	DiD
		(1)	(2)	(2)-(1)
NCSKEW				
Enacting countries	(3)	-0.248	-0.360	-0.112***
Non-enacting countries	(4)	-0.208	-0.245	-0.037***
Diff	(3) – (4)	-0.040***	-0.115***	**-0.073*** **
DUVOL				
Enacting countries	(5)	-0.137	-0.202	-0.066***
Non-enacting countries	(6)	-0.123	-0.145	-0.022***
Diff	(5) – (6)	-0.014***	-0.057***	**-0.044*** **

Table 4. The Effects of M&A Law Enactments on Crash Risk

This table reports the regressions of crash risk on the enactment of M&A laws and other firm and country characteristics:

$$CRASH\_RISK_{ijt} = \beta_0 + \beta_1 POST\_MA_{jt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt},$$

where *CRASH_RISK* is measured by either *NCSKEW* or *DUVOL*. All variables are defined in Appendix. Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	NCSKEW	***DUVOL***
	(1)	(2)
POST_MA	-0.055***	-0.030***
	(-4.28)	(-4.54)
DISACC	0.034**	0.019**
	(2.32)	(2.49)
DTURN	-0.020	-0.013
	(-1.26)	(-1.60)
LNCSKEW	0.078***	0.043***
	(14.91)	(17.02)
SIGMA	0.198	-0.423***
	(0.94)	(-3.99)
RET	3.967***	2.350***
	(11.88)	(12.92)
SIZE	0.005**	0.001
	(2.44)	(0.77)
MTB	0.003**	0.002**
	(2.44)	(2.51)
LEV	-0.023*	-0.022***
	(-1.71)	(-3.00)
ROA	-0.145***	-0.083***
	(-4.76)	(-5.18)
GDPG	-0.001	-0.001
	(-0.65)	(-1.38)
STMCAP	0.000	0.000
	(0.62)	(1.11)
GOVEFF	0.002	0.001**
	(1.36)	(2.39)
Constant	-0.329***	-0.170***
	(-3.58)	(-3.58)
Year fixed effects	Yes	Yes
Country fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Adj. *R*-squared	0.032	0.036
Obs.	76,775	76,775

Table 5. Confounding Channel and Falsification Tests

Panel A of this table reports the summary regression results for the effect of the enactment of M&A laws on stock price crash risk, controlling for potential country-level confounding influences from institutional and legal changes:

$$CRASH\_RISK_{ijt} = \beta_0 + \beta_1 POST\_MA_{jt} + \beta_2 MACRO_{jt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt},$$

where *CRASH_RISK* is measured by either *NCSKEW* or *DUVOL*. *MACRO* refers to either (i) *CORPGOV*, (ii) *INSIDER*, (iii) *SHORT*, and (iv) *FINREFORM*. *CORPGOV* (*INSIDER*) is a binary variable indicating whether a sample country has passed corporate-governance laws (insider-trading laws). *SHORT* is an indicator for whether a country allows short-selling. *FINREFORM* is the financial reform index from Abiad, Detragiache, and Tressel (2008). Panel B of this table reports the summary regression results of the falsification test where we re-estimate the baseline regression but replace *POST_MA* with several dummy variables: *BEFORE*(*-1*) is a dummy variable that equals one if M&A laws will be adopted next year and zero otherwise, *CURRENT*(*0*) is a dummy variable that equals one if M&A laws are adopted that year and zero otherwise, *AFTER*(*+1*) is a dummy variable that equals one if M&A laws were adopted one year ago and zero otherwise, *AFTER(+2*) is a dummy variable that equals one if M&A laws were adopted two years ago and zero otherwise, *AFTER*(*+3*) is a dummy variable that equals one if M&A laws were adopted three years ago and zero otherwise. All variables are defined in Appendix. Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Confounding Channel Tests

	NCSKEW					***DUVOL***				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
POST_MA	-0.055***	-0.051***	-0.062***	-0.040***	-0.049***	-0.029***	-0.028***	-0.035***	-0.018***	-0.023***
	(-4.29)	(-3.95)	(-4.84)	(-3.04)	(-3.65)	(-4.40)	(-4.20)	(-5.23)	(-2.69)	(-3.39)
CORPGOV	-0.001				-0.021*	0.007				-0.004
	(-0.12)				(-1.64)	(1.28)				(-0.55)
INSIDER		-0.246***			-0.175**		-0.138***			-0.088**
		(-2.93)			(-2.05)		(-3.40)			(-2.14)
SHORT			0.052***		0.058***			0.034***		0.037***
			(3.48)		(3.29)			(4.32)		(4.13)
FINREFORM				-0.017***	-0.018***				-0.013***	-0.013***
				(-4.15)	(-4.14)				(-6.31)	(-5.99)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. *R*-squared	0.032	0.032	0.032	0.032	0.033	0.036	0.037	0.037	0.037	0.037
Obs.	76,775	76,775	76,775	71,612	71,612	76,775	76,775	76,775	71,612	71,612

Table 5: Confounding Channel and Falsification Tests – Continued

Panel B: Falsification Test		
	NCSKEW	***DUVOL***
	(1)	(2)
BEFORE(-1)	0.087	0.043
	(1.62)	(1.33)
CURRENT(0)	-0.121***	-0.067***
	(-3.25)	(-2.95)
AFTER(+1)	-0.079**	-0.054**
	(-2.24)	(-2.30)
AFTER(+2)	-0.091*	-0.059**
	(-1.99)	(-2.36)
AFTER(+3)	-0.033*	-0.018*
	(-1.76)	(-1.81)
Other controls	Yes	Yes
Year fixed effects	Yes	Yes
Country fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Adj. *R*-squared	0.032	0.037
Obs.	76,775	76,775

Table 6. Alternative Proxy for Crash Risk, Firm Fixed Effects, and Antitrust Laws

This table report the summary of regression results for additional robustness checks. Panel A reports the results when an alternative measure of crash risk (*COUNT*), which is is the number of crash weeks minus the number of jump weeks, is used as the dependent variable as well as the results with firm-fixed effects. Panel B reports the results for an alternative proxy for the increased threat of takeover, *POST_ANTITRUST*, which equals one if antitrust laws have been passed by year *t* in country *j* (9 countries that adopted antitrust laws as in Bris et al. (2010)), and zero otherwise. All variables are defined in Appendix. Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Alternative Proxy for Crash Risk and Firm-Fixed Effects				
	COUNT		***NCSKEW***	***DUVOL***
	(1)	(2)	(3)	(4)
POST_MA	-0.029**	-0.028**	-0.068***	-0.037***
	(-2.51)	(-2.38)	(-3.87)	(-4.19)
Other controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	No	No
Industry fixed effects	Yes	No	No	No
Firm fixed effects	No	Yes	Yes	Yes
Adj. *R*-squared	0.014	0.037	0.091	0.098
Obs.	76,775	76,775	76,775	76,775
Panel B: Antitrust Laws				
	NCSKEW		***DUVOL***	
	(1)	(2)	(3)	(4)
POST_ANTITRUST	-0.084*	-0.091**	-0.044*	-0.048*
	(-1.92)	(-2.09)	(-1.73)	(-1.89)
POST_MA		-0.056***		-0.030***
		(-4.32)		(-4.58)
Other controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Adj. *R*-squared	0.032	0.032	0.036	0.036
Obs.	76,775	76,775	76,775	76,775

Table 7. Country Institutional Environment: Investor Protection

This table reports the regressions of crash risk on the enactment of M&A laws and other firm and country characteristics for different subsamples split based on proxies for investor protection regimes:

$$CRASH\_RISK_{ijt} = \beta_0 + \beta_1 POST\_MA_{jt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt},$$

where *CRASH_RISK* is measured by either *NCSKEW* or *DUVOL*. "Civil law" ("Common law") is a subsample of countries with a civil-law (common-law) tradition. "High" ("Low") is a subsample of countries that exhibit a value for the efficiency of judicial system index of La Porta et al. (1998) that is above (below) the median of sample countries. All variables are defined in Appendix. Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Panel A: Investor Protection				***Panel B: Legal Enforcement***			
	NCSKEW		***DUVOL***		***NCSKEW***		***DUVOL***	
	Common Law	***Civil Law***	***Common Law***	***Civil Law***	***High***	***Low***	***High***	***Low***
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POST_MA	-0.041	-0.032*	-0.001	-0.019**	-0.065	-0.046***	-0.019	-0.028***
	(-1.03)	(-1.95)	(-0.03)	(-2.35)	(-0.47)	(-3.22)	(-0.26)	(-3.79)
DISACC	0.057*	0.015	0.024	0.009	-0.042	0.036**	-0.017	0.020**
	(1.67)	(0.87)	(1.28)	(1.04)	(-0.94)	(2.24)	(-0.71)	(2.38)
DTURN	-0.046	-0.047***	-0.033	-0.032***	-0.131***	-0.042**	-0.082***	-0.030***
	(-0.89)	(-2.58)	(-1.21)	(-3.30)	(-2.97)	(-2.28)	(-3.09)	(-3.09)
LNCSKEW	0.069***	0.078***	0.037***	0.043***	0.058***	0.081***	0.031***	0.045***
	(5.49)	(12.77)	(6.17)	(14.61)	(5.05)	(13.05)	(5.51)	(15.06)
SIGMA	0.793	-0.073	-0.045	-0.558***	-1.667***	0.636**	-1.350***	-0.170
	(1.51)	(-0.30)	(-0.17)	(-4.62)	(-3.89)	(2.54)	(-6.17)	(-1.35)
RET	3.872***	3.738***	2.534***	2.208***	3.060***	3.963***	2.048***	2.326***
	(4.17)	(10.26)	(4.99)	(11.11)	(4.86)	(10.00)	(5.71)	(10.83)
SIZE	0.007	0.006***	0.002	0.001	-0.017***	0.012***	-0.011***	0.005***
	(1.29)	(2.68)	(0.60)	(1.18)	(-5.05)	(5.32)	(-5.66)	(3.85)
MTB	0.009***	0.000	0.005***	-0.000	0.001	0.002	-0.001	0.001*
	(2.85)	(0.09)	(3.12)	(-0.36)	(0.44)	(1.39)	(-1.00)	(1.74)
LEV	0.020	-0.033**	-0.008	-0.026***	-0.041*	-0.025	-0.035**	-0.023***
	(0.52)	(-2.17)	(-0.38)	(-3.23)	(-1.67)	(-1.54)	(-2.53)	(-2.66)
ROA	-0.167**	-0.127***	-0.102**	-0.073***	-0.106*	-0.150***	-0.062*	-0.087***
	(-2.10)	(-3.70)	(-2.39)	(-4.04)	(-1.83)	(-4.16)	(-1.85)	(-4.58)

GDPG	-0.004	0.000	-0.003*	0.000	0.014	-0.000	0.005	-0.000
	(-1.31)	(0.40)	(-1.92)	(0.37)	(0.46)	(-0.34)	(0.33)	(-0.69)
STMCAP	-0.001***	0.001***	-0.001***	0.001***	-0.003	-0.000	-0.001	-0.000
	(-5.10)	(4.81)	(-6.96)	(6.41)	(-0.49)	(-0.24)	(-0.19)	(-0.25)
GOVEFF	-0.009**	0.000	-0.006***	0.001	0.002	0.001	0.001	0.001
	(-2.18)	(0.30)	(-3.00)	(1.15)	(0.17)	(0.82)	(0.35)	(1.60)
Constant	-0.351*	-0.253**	-0.082	-0.121**	0.255	-0.467***	0.081	-0.232***
	(-1.94)	(-2.50)	(-0.91)	(-2.33)	(0.32)	(-4.53)	(0.21)	(-4.38)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. *R*-squared	0.037	0.032	0.048	0.037	0.030	0.036	0.039	0.040
Obs.	9,802	62,138	9,802	62,138	16,141	55,799	16,141	55,799

Table 8. Country Institutional Environment: Information Environment

This table reports the regressions of crash risk on the enactment of M&A laws and other firm and country characteristics for subsamples split based on proxies for country information environment:

$$CRASH\_RISK_{ijt} = \beta_0 + \beta_1 POST\_MA_{jt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt},$$

where *CRASH_RISK* is measured by either *NCSKEW* or *DUVOL*. "High" ("Low") is a subsample of firms from countries that exhibit a value for the disclosure score of Jin and Myers (2006) (Panel A) (or for the index of accounting standards of La Porta et al. (1998) (Panel B) that is above (below) the median of sample countries. All variables are defined in Appendix. Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Panel A: Disclosure Index				***Panel B: Accounting Standards***			
	NCSKEW		***DUVOL***		***NCSKEW***		***DUVOL***	
	High	***Low***	***High***	***Low***	***High***	***Low***	***High***	***Low***
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POST_MA	-0.020	-0.122***	-0.011	-0.068***	0.024	-0.102***	0.024*	-0.068***
	(-1.15)	(-3.08)	(-1.24)	(-3.33)	(1.63)	(-3.66)	(1.86)	(-4.97)
DISACC	-0.004	0.064**	-0.003	0.039***	0.034*	0.024	0.015	0.014
	(-0.16)	(2.32)	(-0.23)	(2.69)	(1.65)	(1.01)	(1.01)	(1.18)
DTURN	-0.067**	-0.013	-0.043**	-0.009	-0.084***	-0.042*	-0.050***	-0.032***
	(-2.11)	(-0.62)	(-2.38)	(-0.79)	(-3.12)	(-1.88)	(-3.12)	(-2.76)
LNCSKEW	0.084***	0.056***	0.043***	0.032***	0.071***	0.086***	0.039***	0.047***
	(8.77)	(5.41)	(9.61)	(6.34)	(12.23)	(7.86)	(10.80)	(9.32)
SIGMA	2.318***	0.729*	0.891***	-0.191	-1.145***	1.469***	-1.105***	0.252
	(6.08)	(1.84)	(4.66)	(-0.96)	(-4.32)	(3.95)	(-4.80)	(1.37)
RET	3.369***	4.698***	1.901***	2.600***	3.309***	4.345***	2.061***	2.393***
	(5.61)	(6.60)	(5.95)	(6.88)	(8.19)	(7.03)	(6.67)	(7.42)
SIZE	0.010***	0.005	0.005***	-0.000	-0.001	0.019***	-0.002	0.007***
	(2.77)	(1.23)	(2.67)	(-0.06)	(-0.53)	(4.50)	(-1.20)	(3.55)
MTB	0.006***	0.012***	0.004***	0.008***	0.000	0.003	-0.000	0.002
	(2.91)	(4.72)	(3.18)	(5.60)	(0.02)	(0.99)	(-0.46)	(1.46)
LEV	0.026	0.009	0.011	0.000	-0.037**	0.028	-0.033***	0.009
	(0.99)	(0.30)	(0.76)	(0.01)	(-2.33)	(0.99)	(-3.54)	(0.62)
ROA	-0.113***	-0.209***	-0.073***	-0.105***	-0.079**	-0.183***	-0.037	-0.114***
	(-2.66)	(-3.33)	(-3.22)	(-3.25)	(-2.10)	(-3.36)	(-1.08)	(-4.16)

GDPG	0.002	-0.005**	0.001	-0.005***	-0.000	-0.001	-0.000	-0.002*
	(1.13)	(-2.13)	(1.45)	(-3.84)	(-0.09)	(-0.76)	(-0.36)	(-1.72)
STMCAP	-0.000	0.003***	-0.000	0.002***	0.000	0.001**	0.000	0.001***
	(-0.95)	(4.25)	(-1.25)	(5.25)	(0.93)	(2.23)	(0.91)	(3.21)
GOVEFF	-0.003	0.009***	-0.000	0.005***	-0.009***	0.004**	-0.005***	0.002**
	(-1.21)	(5.02)	(-0.25)	(5.90)	(-3.85)	(1.99)	(-4.10)	(2.51)
Constant	-0.145	-1.167***	-0.148	-0.564***	0.323**	-0.864***	0.221***	-0.428***
	(-0.59)	(-6.90)	(-1.16)	(-6.60)	(2.54)	(-5.61)	(3.68)	(-5.51)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. *R*-squared	0.040	0.030	0.043	0.041	0.031	0.037	0.034	0.044
Obs.	23,336	15,451	23,336	15,451	49,816	20,106	49,816	20,106

Table 9. External Firm-Level Governance and Information Environment

This table reports the regressions of crash risk on the enactment of M&A laws and other firm and country characteristics:

$$CRASH\_RISK_{ijt} = \alpha + \beta_1 POST\_MA_{jt} + \beta_2 POST\_MA_{jt} \times FGOV_{ijt} + \beta_3 FGOV_{ijt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt},$$

where *CRASH_RISK* is measured by either *NCSKEW* or *DUVOL*. *FGOV* refers to either analyst coverage (*ANALYST*), institutional block ownership (*BIO*) or production market competition (*HHI*), where the Herfindahl-Hirschman index is calculated as one minus the sum of squared firms' market shares at the country-industry-year level using net sales. All other variables are defined in Appendix. All variables are defined in Appendix. Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	NCSKEW				***DUVOL***			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POST_MA	-0.067***	-0.072***	-0.067***	-0.113***	-0.031***	-0.029***	-0.033***	-0.054***
	(-5.55)	(-4.67)	(-5.64)	(-6.42)	(-5.05)	(-3.72)	(-5.51)	(-5.98)
POST_MA×BIO	0.005***			0.002	0.003***			0.001*
	(3.18)			(1.34)	(2.75)			(1.69)
BIO	-0.001			-0.001	-0.001			-0.001
	(-0.27)			(-0.25)	(-0.29)			(-0.19)
POST_MA×HHI		0.029*		0.047***		0.008		0.019**
		(1.73)		(2.64)		(0.92)		(2.05)
HHI		-0.004		-0.008		0.000		-0.002
		(-0.44)		(-0.91)		(0.05)		(-0.48)
POST_MA×ANALYST			0.029***	0.039***			0.018***	0.025***
			(3.96)	(5.05)			(4.66)	(5.93)
ANALYST			0.014***	0.006			0.006***	0.002
			(3.63)	(1.30)			(3.04)	(0.76)
DISACC	0.022	0.026*	0.025*	0.020	0.013	0.015**	0.014*	0.012
	(1.40)	(1.79)	(1.68)	(1.26)	(1.62)	(2.02)	(1.91)	(1.46)
DTURN	-0.009	-0.010	-0.008	-0.009	-0.006	-0.009	-0.008	-0.006
	(-0.55)	(-0.64)	(-0.52)	(-0.52)	(-0.73)	(-1.07)	(-0.96)	(-0.71)
LNCSKEW	0.079***	0.082***	0.081***	0.078***	0.043***	0.045***	0.044***	0.042***
	(13.00)	(15.26)	(15.10)	(12.85)	(14.56)	(17.39)	(17.22)	(14.40)
SIGMA	0.119	-0.004	-0.086	0.077	-0.456***	-0.526***	-0.565***	-0.470***
	(0.54)	(-0.02)	(-0.41)	(0.35)	(-4.10)	(-5.03)	(-5.34)	(-4.18)
RET	4.078***	4.065***	4.209***	4.195***	2.410***	2.410***	2.483***	2.468***

	(11.48)	(12.11)	(12.51)	(11.75)	(12.41)	(13.19)	(13.54)	(12.66)
SIZE	0.000	0.005***	-0.001	-0.004	-0.002*	0.001	-0.002*	-0.004***
	(0.08)	(2.81)	(-0.39)	(-1.51)	(-1.65)	(0.98)	(-1.68)	(-2.76)
MTB	0.006***	0.004***	0.004***	0.006***	0.003***	0.002***	0.002***	0.003***
	(4.26)	(3.18)	(3.57)	(4.41)	(4.55)	(3.27)	(3.58)	(4.64)
LEV	-0.011	-0.026*	-0.028**	-0.011	-0.016**	-0.025***	-0.025***	-0.016**
	(-0.77)	(-1.91)	(-2.03)	(-0.78)	(-2.09)	(-3.38)	(-3.47)	(-2.08)
ROA	-0.168***	-0.169***	-0.178***	-0.174***	-0.098***	-0.097***	-0.102***	-0.102***
	(-5.29)	(-5.55)	(-5.80)	(-5.49)	(-5.90)	(-6.05)	(-6.33)	(-6.13)
GDPG	-0.001	-0.002**	-0.002*	-0.000	-0.001	-0.001***	-0.001***	-0.000
	(-0.59)	(-2.07)	(-1.85)	(-0.11)	(-1.24)	(-2.94)	(-2.67)	(-0.73)
STMCAP	-0.000	-0.000**	-0.000**	0.000	0.000	-0.000	-0.000	0.000**
	(-0.23)	(-2.40)	(-2.08)	(0.37)	(1.58)	(-1.04)	(-0.69)	(2.13)
GOVEFF	0.002***	0.002***	0.002***	0.002***	0.001***	0.001***	0.001***	0.001***
	(5.45)	(6.24)	(6.08)	(5.34)	(4.27)	(4.99)	(4.89)	(4.20)
Constant	-0.461***	-0.516***	-0.403***	-0.399***	-0.179***	-0.212***	-0.155**	-0.121***
	(-3.77)	(-4.27)	(-3.27)	(-4.59)	(-2.62)	(-3.11)	(-2.25)	(-2.90)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. *R*-squared	0.031	0.029	0.029	0.031	0.035	0.033	0.033	0.036
Obs.	62,028	76,775	76,775	62,028	62,028	76,775	76,775	62,028

Table 10. M&A Laws and Earnings Management

This table reports the regressions of earnings management on the enactment of M&A laws and other firm and country characteristics:

$$Earnings\_Management_{ijt} = \alpha + \beta_1 POST\_MA_{jt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt},$$

where *Earnings_Management* is measured either as discretionary accruals (*DA*) and marginally beating past earnings (*BEAT_ROA*). *DA* is the difference between its total accruals and the fitted normal accruals derived from Dechow, Sloan and Sweeney's (1996) modification of Jones's (1991) model. *BEAT_ROA* is an indicator equal to one if the change in net income scaled by lagged total assets is positive and lies between 0% and 1% and zero otherwise. All variables are defined in Appendix. Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	DA	***BEAT_ROA***
	(1)	(2)
POST_MA	-0.026***	-0.004***
	(-5.75)	(-2.74)
DTURN	0.018***	0.001
	(3.85)	(1.09)
LNCSKEW	-0.000	0.000
	(-0.30)	(0.83)
SIGMA	1.089***	-0.014
	(16.57)	(-0.99)
RET	-0.358***	0.037
	(-3.34)	(1.20)
SIZE	-0.006***	0.001***
	(-9.50)	(5.85)
MTB	0.009***	-0.000
	(17.82)	(-1.18)
LEV	-0.013**	-0.002*
	(-2.52)	(-1.90)
ROA	-0.144***	0.009***
	(-9.61)	(4.76)
GDPG	-0.000	0.000
	(-0.01)	(0.28)
STMCAP	0.000***	0.000
	(6.15)	(0.94)
GOVEFF	0.001**	-0.000
	(2.03)	(-0.40)
Constant	0.096***	-0.011
	(2.68)	(-1.32)
Year fixed effects	Yes	Yes
Country fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Adj. *R*-squared	0.260	0.04
Obs.	76,775	76,775

Internet Appendix

Does Takeover Activity Affect Stock Price Crash Risk? Evidence from International M&A Laws

This version: December 25, 2018

This Internet Appendix provides supplementary analyses and robustness tests for the main results presented in the paper "Does Takeover Activity Affect Stock Price Crash Risk? Evidence from International M&A Laws." Table A1 of Section A provides an overview of the M&A laws and takeover activity following the adoption of these laws. Tables A2 through A4 of Section B discusses additional robustness tests. The tables are organized as follows:

Table A1, M&A laws and takeover activities;

Table A2, antitrust laws and crash risk;

Table A3, M&A laws and crash risk in enacting countries; and

Table A4, baseline regression using a subsample that excludes Japan.

A. M&A Laws and Takeover Activities

Over the past decades, regulators in many countries have passed M&A laws to foster takeover activity. According to Holmstrom and Kaplan (2001), many countries other than the United States have historically achieved less success in restructuring industry and, therefore, to the extent that corporate restructurings facilitate cross-firm synergies and efficiency gains or overhaul weak governance in target firms, fostering M&A activity within capital markets is an important goal. The legal changes associated with the staggered adoption of M&A laws around the world are significant because these acts are passed to facilitate takeover activity by reducing

barriers to M&A transactions, encouraging information dissemination, and increasing minority shareholder protection. Consistent with these objectives, related studies have documented that the passage of M&A laws significantly increases M&A activities (Glendening, Khurana, and Wang, 2016; Lel and Miller, 2015; Nenova, 2006). Thus, the enactment of M&A laws creates a plausibly exogenous shock to the threat of takeover, because these laws are passed by countries and are not endogenously driven at the firms' discretion.

Our study assumes that the staggered adoption of M&A laws increases takeover activities and, hence, the threat of takeover, as documented by Glendening, Khurana, and Wang (2016) and Lel and Miller (2015). We reconfirm this evidence by showing that M&A activities increase significantly following the enactment of M&A laws. Specifically, we construct a merger intensity variable, defined as the number of M&As of all firms divided by the total number of publicly listed firms in the country in a given year, where the total number of publicly listed firms is obtained from the World Bank database. We then regress merger intensity on the *POST_MA* dummy and a set of country-level controls. The variable *POST_MA* equals one if M&A laws were passed by year *t* in country *j* and zero otherwise. The set of control variables includes the natural logarithm of the GDP per capita (*GDP*), GDP growth (*GDPG*), the size of stock markets scaled by the GDP (*STMCAP*), common law versus civil law legal regimes (*CIV_COM*), creditor rights (*CR*), and the judicial system efficiency (*EFF_JUD*) of La Porta et al. (1998).

Table A1 shows the regression results. We find that the coefficient estimate of *POST_MA* dummy is positive and statistically significant, suggesting that merger intensity increases significantly following the staggered adoption of M&A laws.

B. Additional Robustness Checks

First, when we use *COUNT* as an alternative crash risk variable and *POST_ANTITRUST* as an alternative proxy for the threat of takeover, we re-estimate the baseline regression and report the results in Table A2. We find the coefficient estimate of *POST_ANTITRUST* is negative and significant, suggesting that crash risk is mitigated after the enactment of the antitrust laws.

Second, we examine whether our results are robust to the regressions using only the enacting countries. We re-estimate the baseline regression model using a subsample of firms from the 12 countries that enacted M&A laws during the sample period and report the results in Table A3. We find that the coefficient estimates of *POST_MA* are negative and statistically significant, suggesting that the firms from enacting countries still experience lower crash risk in the post-enactment period relative to the pre-enactment period.

Finally, because Japan dominates our sample in terms of firm–year observations, we exclude it from our sample and re-estimate the baseline regression. We report the regression results in Table A4. Again, we find that the coefficient estimates of *POST_MA* are negative and statistically significant, suggesting that our results are robust to the exclusion of Japanese firms.

Table A1. M&A Laws and Takeover Activities

This table presents regression results for the effects of the enactment of M&A laws on takeover activities. The dependent variable is the merger intensity, which is defined as the number of M&As divided by the total number of publicly listed firms. Information on the total number of publicly listed firms is from World Bank. *POST_MA* is a dummy variable that equals one if M&A laws have been passed by year *t* in country *j*, and zero otherwise. *GDP* is the natural logarithm of GDP per capita. *GDPG* is the annual growth in GDP per capita. *STMCAP* is the ratio of stock market capitalization to GDP. *CR* is the creditor rights of La Porta et al. (1998). *CIV_COM* is an indicator variable that equals one if the country is of civil law legal regime, and zero otherwise. *EFF_JUD* is the strength of legal enforcement, measured by the efficiency of judicial system index of La Porta et al. (1998). Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Merger Intensity
	(1)
POST_MA	0.282***
	(2.76)
GDP	0.750***
	(9.92)
GDPG	-0.019*
	(-1.90)
CR	-0.093**
	(-2.47)
STMCAP	-0.002***
	(-2.80)
CIV_COM	-0.311***
	(-3.00)
EFF_JUD	0.009
	(0.45)
Constant	-5.712***
	(-10.08)
Adj. *R*-squared	0.401
Obs.	349

Table A2. Antitrust Laws and Crash Risk

This table reports the regressions of crash risk on the enactment of M&A laws and other firm and country characteristics using alternative proxies for crash risk and the threat of takeover:

$$CRASH\_RISK_{ijt} = \beta_0 + \beta_1 POST\_ANTITRUST_{jt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt},$$

where *CRASH_RISK* is measured by *COUNT*, which is the number of crash weeks minus the number of jump weeks. *POST_ANTITRUST* equals one if antitrust laws have been passed by year *t* in country *j* (9 countries that adopted antitrust laws as in Bris et al. (2010)), and zero otherwise. Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	COUNT
	(1)
POST_ANTITRUST	-0.101***
	(-2.60)
DISACC	0.035***
	(2.86)
DTURN	-0.003
	(-0.24)
LNCSKEW	0.027***
	(6.81)
SIGMA	0.724***
	(4.35)
RET	1.261***
	(4.30)
SIZE	0.003*
	(1.71)
MTB	0.002**
	(2.28)
LEV	0.017
	(1.52)
ROA	-0.092***
	(-3.83)
GDPG	0.000
	(0.12)
STMCAP	0.000**
	(2.54)
GOVEFF	0.002**
	(1.97)
Constant	-0.331***
	(-4.47)
Year fixed effects	Yes
Country fixed effects	Yes
Industry fixed effects	Yes
Adj. *R*-squared	0.015
Obs.	76,775

Table A3. M&A Laws and Crash Risk in Enacting Countries

This table reports the regressions of crash risk on the enactment of M&A laws and other firm and country characteristics for the subsample of firms from 12 countries that adopted M&A laws during the sample period.

$$CRASH\_RISK_{ijt} = \beta_0 + \beta_1 POST\_MA_{jt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt},$$

where *CRASH_RISK* is measured by either *NCSKEW* or *DUVOL*. All variables are defined in Appendix A. Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	NCSKEW	***DUVOL***
	(1)	(2)
POST_MA	-0.043**	-0.025**
	(-2.23)	(-2.01)
DISACC	0.024	0.024
	(0.93)	(1.13)
DTURN	-0.104***	-0.064***
	(-3.16)	(-3.03)
LNCSKEW	0.077***	-0.046***
	(7.36)	(-8.08)
SIGMA	2.380***	0.393
	(5.90)	(1.38)
RET	4.165***	1.839***
	(6.40)	(4.24)
SIZE	0.008*	0.032***
	(1.81)	(4.87)
MTB	0.012***	0.003
	(4.25)	(1.20)
LEV	0.030	0.049
	(1.04)	(1.39)
ROA	-0.157***	-0.120***
	(-2.86)	(-2.86)
GDPG	0.000	-0.001
	(0.23)	(-0.57)
STMCAP	-0.001***	-0.001***
	(-3.29)	(-5.42)
GOVEFF	-0.001	-0.000
	(-0.23)	(-0.20)
Constant	-0.668***	-0.799***
	(-5.41)	(-5.01)
Year fixed effects	Yes	Yes
Country fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Adj. *R*-squared	0.038	0.099
Obs.	19,514	19,514

Table A4. Baseline Regression Using a Subsample that Excludes Japan

This table reports the regressions of crash risk on the enactment of M&A laws and other firm and country characteristics for the subsample of non-Japanese firms.

$$CRASH\_RISK_{ijt} = \beta_0 + \beta_1 POST\_MA_{jt} + \gamma' CONTROL_{ijt-1} + \gamma_j + \psi_k + \phi_t + \varepsilon_{ijt},$$

where *CRASH_RISK* is measured by either *NCSKEW* or *DUVOL*. All variables are defined in Appendix A. Robust *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	NCSKEW	***DUVOL***
	(1)	(2)
POST_MA	-0.055***	-0.031***
	(-3.89)	(-4.26)
DISACC	0.034**	0.018**
	(2.13)	(2.23)
DTURN	-0.019	-0.015*
	(-1.10)	(-1.73)
LNCSKEW	0.073***	0.040***
	(10.46)	(12.18)
SIGMA	1.673***	0.405***
	(6.44)	(3.16)
RET	3.873***	2.247***
	(8.85)	(9.76)
SIZE	0.011***	0.004***
	(4.01)	(2.97)
MTB	0.007***	0.004***
	(4.18)	(4.97)
LEV	0.018	0.005
	(0.98)	(0.56)
ROA	-0.170***	-0.101***
	(-4.78)	(-5.59)
GDPG	-0.001	-0.001
	(-0.98)	(-1.45)
STMCAP	0.000	0.000
	(0.08)	(0.18)
GOVEFF	0.003***	0.002***
	(2.70)	(3.47)
Constant	-0.740***	-0.381***
	(-6.88)	(-6.95)
Year fixed effects	Yes	Yes
Country fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Adj. *R*-squared	0.030	0.036
Obs.	43,895	43,895