Earnings Management and Stock Price Crashes: The Deteriorating Information Environment Post-Cross-Delisting

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ABSTRACT

We test whether cross-delisted firms from the major U.S. stock exchanges experience an increase in crash risk associated with earnings management. Consistent with our prediction, we find that earnings management have a greater positive impact on stock price crash risk post-cross-delisting when compared to a sample of still cross-listed firms. Moreover, our results suggest that this effect is more pronounced for cross-delisted firms from countries with weaker investor protection and poorer quality of their information environment. We further examine stock price reaction to earnings announcements in the pre- and post-cross-delisting period. Our evidence shows that post-cross-delisted firms experience higher abnormal returns around earnings announcements, especially those from countries with weaker institutional quality and firms with poorer information environment.

Classifications: F30; F31; G15; G30

Keywords: Cross-Delisting; Earnings Announcements; Earnings Management; Information Asymmetry; Stock Price Crashes

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1. INTRODUCTION

Foreign firms that cross-list on a United States (U.S.) stock exchange commit themselves to a set of financial disclosure requirements, in general more stringent than the domestic reporting requirements, imposed by the Securities and Exchange Commission (SEC), and in accordance with U.S. generally accepted accounting principles (GAAP). This new legal environment brings important benefits to the firms as their corporate governance improves, as explained in the "bonding hypothesis" of Coffee (1999, 2002) and Stulz (1999). Moreover, Lang, Lins and Miller (2003) argue that this stricter regulatory environment mitigates managers' ability to manipulate financial information. Those authors document that cross-listed firms on U.S. exchanges engage less in earnings management than cross-listed firms on other non-U.S. exchanges. Higher levels of earnings management mean that managers have more latitude to manipulate information and withhold bad news, resulting in a higher level of firm opacity as the financial statements become less informative (e.g., Jin and Myers (2006), Kothari, Shu and Wysocki (2009)). Therefore, firms where managers are more engaged in earnings management are more likely to observe, in the near future, a stock price crash, i.e., a sudden and sharp decline of their stock prices. Based on these arguments, we predict that after foreign firms cross-delist from the U.S. stock exchanges, as their legal environment becomes less strict (a reverse "bonding" effect), managers will have more incentives to use earnings management to withhold bad news. Therefore, we expect that post-cross-delisting firms will experience an increase in their crash risk associated with earnings management.

We test our main hypotheses using a treatment group of 583 cross-delisted firms from the major U.S. stock exchanges (4,192 firm-years observations) from 38 countries, and a control group of 564 cross-listed firms (4,900 firm-year observations). We follow previous literature on stock price crash risk (e.g., Hutton, Marcus and Tehranian (2009), Kim, Li and Zhang (2011a; 2011b), Boehme, Fotak and May (2014), DeFond *et al.* (2015)) and use different regressions techniques and alternate crash risk measures. Our findings show a significant increase in crash risk associated with earnings management in the post-cross-delisting period relative to a control group of firms that remained cross-listed. Moreover, we find that this effect is more pronounced when foreign firms are from less developed countries (lower Gross Domestic Product (GDP) per capita) and countries with weaker shareholder protection (La Porta, Lopez-De-Silanes and Shleifer, 2008), whereas firms from countries with stronger investor protection are less likely to engage in earnings management post-cross-delisting. This result is consistent with Leuz, Nanda and Wysocki (2003), who find that earnings management tends to be more pronounced in weaker investor protection regimes and poor information environments. Our results also support the idea that delisted firms with more opaque information environments (i.e., those with higher bid-ask spreads or more research and development (R&D) expenses) are more prone to engage in earnings management. This effect is significantly higher in the post-delisting period relative to the pre-delisting period. Taken together, our evidence is consistent with the arguments of the "bonding" hypothesis in the sense that our results suggest a reverse "bonding" effect after the firm cross-delists and is no longer under the stricter legal environment imposed by the U.S. market regulators. Whereby, this decrease in disclosure provoked an augment in information asymmetry.

We further extend our analysis to the stock price reaction around earnings announcements to find a mechanism that could explain our main results. We thus examine whether the stock price reactions to earnings announcements increase in the post-cross-delisting period. The rationale behind this hypothesis is that lower levels of disclosure reduces investors' confidence that transactions will occur at fair value, which leads to higher volatility in stock price returns (Bailey, Karolyi and Salva (2006)). Our findings show that cross-delisted firms from countries with weaker investor protection and poorer quality of their information environment exhibit greater stock price variation around earnings announcements in the post-delisting-period. The results might be explained, in part, because those firms no longer comply with the stricter disclosure requirements imposed by the SEC, which reduces the information quality of stock prices and increases the surprise effect of earnings announcements.

The empirical findings of our study contribute to the growing literature of stock crash risk that has received greater attention since the financial crisis of 2007-2008 (Hutton, Marcus and

Tehranian, 2009; Kim, Li and Zhang, 2011a, 2011b; Boehme, Fotak and May, 2014; DeFond *et al.*, 2015) and to the vast literature on the benefits of cross-listing on a U.S. stock exchange (e.g. Stulz (1999), Coffee (1999, 2002), Doidge, Karolyi and Stulz (2004), Doidge, Karolyi and Stulz (2009), Gagnon and Karolyi (2017)) by showing signs of a reverse "bonding" effect after cross-delisting, especially in firms with poor information environments, from less developed countries, or countries with weaker shareholder protection.

The remainder of this study proceeds as follows. Section 2 provides a review of the related literature and outlines our research hypotheses. Section 3 describes our data and the methodology. Section 4 discusses the empirical results. Section 5 concludes.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

There is, to some extent, an institutional guarantee that cross-listed firms in U.S. stock exchanges are held to similar standards as U.S. domestic firms, meaning that, on average, foreign firms benefit from an improvement in their information environment and financial transparency after cross-listing (Lang, Lins and Miller, 2003). This rationale is based on the assumption post-cross-listing, due to the more stringent disclosure requirements, that managers have lower incentives to manipulate the financial reporting process. Consistent with this view, Lang, Lins and Miller (2003) show that managers of firms cross-listing in U.S. exchanges are less prone to engage in earnings management and that financial reporting is more strongly correlated with stock prices. Their findings are based on a matched sample of cross-listed firms on U.S. stock exchanges and cross-listed firms on non-U.S exchanges. Additionally, Leuz, Nanda and Wysocki (2003) point out that investor protection is the key driver of earnings management activity around the world. They examine cross-country differences in earnings management and find that stronger protection of minority investors' rights mitigate insiders' incentives to manage reported earnings because they have little to cover from investors. Further, they find a negative relation between corporate governance measures and earnings management proxies based on discretionary accruals[1]. Discretionary accruals are considered a measure of financial reporting opacity because it masks some information about the firm's fundamentals (Sloan, 1996).

Managers can use their accounting discretion to manipulate financial reporting and manage the flow of information to the market. For instance, managers can manipulate financial information disclosure by accelerating the reporting of future revenues or delaying the reporting of current costs to hide poor current performance. Conversely, managers can withhold information about strong current performance to create reserves in the future. These movements create a smoothing effect, making earnings less variable than the firm's true economic performance (Leuz, Nanda and Wysocki, 2003). However, the amount of information that can be delayed or withheld by managers is limited and they tend more often to withhold bad news than good news (Kothari, Shu and Wysocki, 2009). Consequently, as Jin and Myers (2006) refer, at some point in time all bad news will come out simultaneously, leading to a crash in the stock price. Indeed, some recent empirical literature on stock price crashes (e.g., Hutton, Marcus and Tehranian (2009), Kim, Li and Zhang (2011a; 2011b), Boehme, Fotak and May (2014), DeFond *et al.* (2015)) provide evidence that firms that withhold significant amount of negative news for an extend period of time experience a sudden crash in stock price when the true information is revealed. On the other side of this discussion, Kim *et al.* (2016) document that expected crash risk decreases with financial statement comparability. Using the comparability measures of De Franco *et al.* (2011), authors define comparability as the closeness between two firms' accounting and financial reporting systems. They find that the negative relation between the expected crash risk and financial statement comparability is more pronounced in firms where managers are more prone to withhold bad news. Thereby, previous literature on crash risk considers earnings management based on discretionary accruals as a reliable predictor of crash risk. We combine these two branches of the literature to analyze how the relation between crash risk and earnings management changes after firms cross-

[1] Accruals can be decomposed in discretionary and nondiscretionary. The discretionary component of accruals identifies management decisions, while the nondiscretionary component reflects operating business conditions. According to prior research on earnings management (e.g., Healy (1985), DeAngelo (1986), Jones (1991), Dechow, Sloan and Sweeney (1995)), discretionary accruals is considered a well-fitted proxy for earnings quality because it reflects management decisions.

delist from a U.S. stock exchange and that are no longer under the SEC disclosure requirements. If we believe that a reverse "bonding" effect will occur post-cross-delisting, then we should expect a higher sensitivity of crash risk to earnings management. However, it is also important to emphasize that the quality of financial reporting is strongly affected by regulatory enforcement, legal environment and managerial incentives (e.g., Lang, Lins and Miller (2003), Lang, Raedy and Yetman (2003), Leuz, Nanda and Wysocki (2003), Lang, Raedy and Wilson (2006)). Consistent with "bonding" hypothesis, Lang, Raedy and Yetman (2003) find that cross-listed firms on U.S. exchanges have better information environment than non-cross-listed firms, which is associated with higher market valuations. Therefore, it is expected that strong regulatory enforcement and disclosure standards provided by a cross-listing in U.S. exchanges should reduce managers' capacity to manipulate information. This argument stresses the importance of legal systems in protecting investors' rights (e.g., La Porta *et al.* (1998), La Porta, Lopez-De-Silanes and Shleifer (2008)), which limits incentives to mask firm's true performance (Leuz, Nanda and Wysocki, 2003)). Furthermore, the level of opacity (i.e., information asymmetry) also affects the relation between earnings management and crash risk. Firms with more information asymmetry that engage in earnings management are even more likely to suffer crash risk (e.g., Hutton, Marcus and Tehranian (2009), Kim, Li and Zhang (2011a; 2011b)). Consistent with this view, previous international evidence on crash risk (e.g., Jin and Myers (2006)), supports that corporate managers in more opaque informational environments should find it easier to withhold bad news and, consequently, should experience higher crash risk. Thereby, we predict that cross-delisted firms with poor quality of information environment that terminate reporting requirements with the SEC, should be motivated to engage in higher levels of earnings management.

Based on that previous evidence, we formulate our first hypotheses.

Hypothesis 1a: After cross-delisted from U.S. exchange markets, firms that engage in earnings management will experience higher crash risk.

Hypothesis 1b: The increase in crash risk associated with earnings management should be stronger for cross-delisted firms from countries with weaker institutional quality and firms with information asymmetry.

Since the seminal paper of Ball and Brown (1968), a large number of researchers dedicate their time to examine the stock price reaction to earnings announcements. On the side of cross-listing, Bailey, Karolyi and Salva (2006) find that stock price and volume reactions to earnings announcements increase after a firm cross-lists in U.S. markets. However, previous literature (e.g. Kim and Verrecchia (1991a; 1991b; 1994)) shows that volume trading and stock price reactions around earnings announcements are positively related to the level of information asymmetry among investors; that branch of literature defends that trading volume reactions to earnings announcements are an increasing function of the magnitude of stock price reaction and the level of information asymmetry among investors, especially on the dispersion in investors' opinions based on the degree of information asymmetry. Thus, if regulation helps reducing information asymmetry, one should expect that reactions to earnings announcement to be smaller for firms from countries with better institutional quality and better information environment. Hence, the magnitude of the surprise of the earnings announcements should be smaller for firms from countries with better information environment, which can be measured by the degree of disclosure requirements. On the other side, and since the quality of firms' information environment is negatively correlated with the magnitude of information asymmetry, the magnitude of the surprise of the earnings announcements should be greater for firms from countries with poor quality of information environment

Based on those previous findings, we formulate our final hypothesis.

Hypothesis 2: Cross-delisted firms from U.S. exchange markets will experience greater stock price reactions around earnings announcements in the post-cross-delisting, especially those from countries with weaker institutional quality and firms with information asymmetry.

3. DATA AND METHODOLOGY

3.1 Data

Our initial sample, collected from the SEC's website, includes all foreign firms with equity shares registered and reporting with the SEC. Information about delistings is from EDGAR's[2] archive, Form 15F filed between 2000 and 2012[3]. Based on this information, we identified firms that cross-delisted and those that remained listed during our sample period. We cross-checked and complemented information collected from SEC's website with information from other sources, including: i) Bank of New York and Citibank, which manage most of the American Depositary Receipts[4] (ADRs) issued by foreign firms; b) U.S. markets as New York Stock Exchange (NYSE), NASDAQ, Over-The-Counter Bulletin Board (OTCBB) and Over-The-Counter (OTC) Markets Portal. We only included firms cross-listed in major markets. Hereby, foreign firms that move from one major exchange to another are not treated as delists, whereas firms that move to the Over the Counter (OTC) market, OTCBB, or to the "Pink Sheets" are treated as delists.

Financial data are from the Thomson Financial's Worldscope database and stock price data and trading volume are from Datastream; we collect home market prices and if firms are not listed in their home country, we take prices from its primary listing market. As a standardized procedure in literature, we exclude financial firms (SIC codes between 6000 and 6999) and utilities (SIC codes between 4900 and 4949) because their accounting figures are ruled by special statutory requirements. We also eliminate observations with total assets under $10 million to make firms more comparable across countries (e.g., Loureiro and Taboada (2015)), with negative or missing information on assets, sales,

[2] Electronic Data Gathering, Analysis, and Retrieval system (EDGAR's) provided by the SEC.

[3] Our sample period starts in 2000 because information about foreign firms registered and reporting with the SEC is not available in 1995 and in 1999 at the SEC's website.

[4] Foreign firms can obtain or issue equity financing by using Level 1, 2 or 3 ADRs. Our sample only includes Level-2 and Level-3 ADRs. A level-2 ADR provides shares listed and traded on the U.S. exchange markets. The Level-3 ADR is used when a company has made a public offering in the U.S. Our sample only includes Level-2 and Level-3 ADRs.

market and book value of equity. To reduce the effect of outliers, all the variables are winsorized at 1% in each tail. We measure all monetary variables in millions of 2000 U.S. dollars.

This screen process leads to a treatment group of 583 cross-delisted firms (4,192 firm-years observations) from 38 countries, and a control group of 564 cross-listed firms (4,900 firm-year observations). Our treatment group includes all firms that have delisted at some point between 2000 and 2012, while the control group includes all firms that remained cross-listed. Other variables, namely industry-level and country-level variables, are collected from a variety of sources. Data on earnings announcements dates, actual earnings, analyst earnings forecast and the number of analysts that follows each firm are from Institutional Brokers Estimate System (I/B/E/S).

All variables are described in Appendix A.

3.2 Stock Price Crashes and Firm-specific Returns

To estimate crash risk measures, first we estimate firm-specific returns. As DeFond *et al.* (2015), we use weekly returns to mitigate measurement problems associated with low frequent trading and issues related with inaccurate return distributions associated with daily returns. We estimate firm-specific weekly returns from the model below, using the local market index and a world market index. As in Hutton, Marcus and Tehranian (2009), we include lead and lag domestic (world) stock market returns to account for nonsynchronous trading.

$$R_{i,t} = \alpha_i + \beta_{i,t-1}R_{m,t-1} + \beta_{i,t}R_{m,t} + \beta_{i,t+1}R_{m,t+1} + \beta^w_{i,t-1}R_{w,t-1} + \beta^w_{i,t}R_{w,t} + \beta^w_{i,t+1}R_{w,t+1} + \varepsilon_{i,t} \quad (1)$$

where $R_{i,t}$ is firm *i*'s stock return in week *t*; $R_{m,t}$ is the domestic market index return in week *t*; $R_{w,t}$ is the return on the world market index in week *t*, and $\varepsilon_{i,t}$ is firm *i*'s weekly firm-specific return. Following prior literature (e.g., Boehme, Fotak and May (2014)), we construct our measure of firm-specific return as the natural logarithm of one plus the firm-specific return ($\varepsilon_{i,t}$). The firm-specific log-return is denoted as *RETURN*.

We use alternate measures of crash risk. As in Hutton, Marcus and Tehranian (2009) and Boehme, Fotak and May (2014), our first crash risk measure is an indicator variable *CRASH*, which equals one if a firm experiences one or more stock price crashes during the current year *t* and zero otherwise. A stock price crash, in year *t*, occurs whenever the firm-specific weekly return of firm *i* falls by 3.09[5] or more standard deviations below its mean in that same year. Because cross-delisting announcements can themselves lead to stock price crashes, we eliminate those that happened around the cross-delisting announcement.

Panel A of Table 1 reports the number of firms that experienced a stock price crash in each year between 2000 and 2012, as well as the incidence of stock price crashes per year by treatment (pre- and post-) and control group. In Panel B of Table 1, we observe an incidence of stock price crashes of 19.5% (23.8%) in our firm-year panel of the pre- (post-) treatment group. The proportion of cross-delisted firms that register stock crashes in the post-delisting period is 4.3 percentage points (pp) higher than in the pre-delisting period and this difference is statistically significant. Panel C of Table 1 shows that the incidence of stock price crashes is of 20.7% (17.3%) in our firm-year panel of the treatment (control) group. The difference between groups is statistically significant, which means that the treatment group registers a higher proportion (3.4pp) of stock crashes than the control group of cross-listed firms.

[Insert Table 1 here]

A flaw of the variable *CRASH* is that it does not capture the asymmetry in the return distribution; when the left tail of stock returns distribution is fatter and longer than the right tail, firms are more prone of experiencing extreme negative stock returns (DeFond *et al.*, 2015). To overcome this issue, in the multivariate analysis we use two measures initially proposed by Chen, Hong and Stein (2001) and used in several other studies (e.g., Chen, Hong and Stein (2001), Kim, Li and Zhang (2011a; 2011b), Boehme, Fotak and May (2014), DeFond *et al.* (2015)), namely the negative skewness – *NSKEWN* – and down-to-up volatility – *DUVOL*. The *NSKEWN* is defined as the negative one multiplied by the skewness of the firm-specific weekly returns in a given year.

[5]As in Hutton, Marcus and Tehranian (2009), the cutoff of 3.09 standard deviations is chosen to generate a frequency of 0.1% in the normal distribution.

This measure captures the magnitude of left-ward skewness of the firm's weekly returns; it will be greater when firm's returns are more negatively skewed. Hence, larger values of *NSKEWN* indicate greater crash risk. The other alternate measure of crash risk is the down-to-up volatility (*DUVOL),* defined as the standard deviation of the firm-specific weekly returns that are below the firm's mean divided by the standard deviation of the firm-specific weekly returns that are above the firm's mean in a given year. *DUVOL* captures asymmetric volatilities between negative and positive returns. Once again, larger values of *DUVOL* indicate greater crash risk.

Hypothesis 1a posits that cross-delisted firms that engage in earnings management will experience subsequent increases in crash risk. Consistent with previous literature (e.g., Hutton, Marcus and Tehranian (2009)), we use the total value of discretionary accruals as a proxy for earnings management. High values of discretionary accruals suggest that managers manipulate the financial information to distort reported earnings, thus masking the true firm's performance. To test hypothesis 1a we follow the literature (see, e.g., Chen Hong and Stein (2001), Kim, Li and Zhang (2011a), (2011b), Boehme, Fotak and May (2014)) and model the propensity of cash risk as function of earnings management. We use information from year *t-1* to predict crashes in year *t* and estimate several specifications of equation (2).

$$Crash\ Risk_{i,t} = \alpha_i + \beta_1 EM_{i,t-1} + \beta_2 Delist_{i,t} + \beta_3 Treat_i + \beta_4 EM_{i,t-1} \times Delist_{i,t} \times Treat_i + \beta_5 EM_{i,t-1} \times Delist_{i,t} + \beta_6 EM_{i,t-1} \times Treat_i + \beta_7 Delist_{i,t} \times Treat_i + \gamma_1 \left(Control\ firm\_level_{i,t-1}\right) + \lambda_k + \eta_j + \gamma_t + \varepsilon_{i,t} \quad (2)$$

where $Crash\ Risk_{i,t}$ is the dependent variable that corresponds to the alternate measures of crash risk (*NSKEWN* and *DUVOL)* for firm *i,* in year *t*. $EM_{i,t-1}$ is an indicator variable that equals one for firms above median of discretionary accruals in their country, and zero otherwise. $Delist_{i,t}$ is an indicator variable that equals one starting in year *t+1* after the cross-delisting event, and zero otherwise. $Treat_i$ is an indicator variable that equals one if firm *i* is included in our treatment group, and zero otherwise. The treatment group includes all firms in our sample that have cross-delisted at some point in time between 2000 and 2012. Consistent with previous studies (e.g., Chen Hong and Stein (2001), Kim, Li and Zhang (2011a; 2011b), Boehme, Fotak and May (2014)), our set of controls includes the following variables: $TURN_{i,t-1}$ is the annual change in the average monthly share turnover in the previous year (*t-1*); $SIZE_{i,t-1}$ is the natural logarithm of the market value of equity in year *t-1*; $STDEV_{i,t-1}$ is the standard deviation of weekly firm-specific returns in year *t-1*; $RETURN_{i,t-1}$ is the average weekly firm-specific return in year *t-1*; $ROA_{i,t-1}$ is the net income before extraordinary items scaled by total assets in year *t-1*; $LEVERAGE_{i,t-1}$ is the short-term plus long-term (total) debt scaled by total assets in year *t-1*; $ALPHA_{i,t-1}$ is the natural logarithm of one plus the intercept (alpha) estimated from equation (1) in the prior year, which captures whether the firm outperformed or underperformed the market; $MB_{i,t-1}$ is the market value of equity divided by the book value of equity in year *t-1*; $DISACCRUAL_{i,t-1}$ is the absolute value of discretionary accruals[6], estimated according the modified Jones' (1991) model (Dechow, Sloan and Sweeney 1995). We estimate discretionary accruals as the residuals from equation (3):

$$\frac{ACCRUALS_{i,t}}{TA_{i,t-1}} = \alpha_0 \frac{1}{TA_{i,t-1}} + \beta_1 \frac{\Delta REVENUES_{i,t}}{TA_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{TA_{i,t-1}} \quad (3)$$

where $ACCRUALS_{i,t} = (\Delta CA_{i,t} - \Delta CASH_{i,t}) - (\Delta CL_{i,t} - \Delta STD_{i,t}) - DEP_{i,t}$; $\Delta CA_{i,t}$ is the change in current assets, $\Delta CASH_{i,t}$ is the change in cash and equivalents of cash, $\Delta CL_{i,t}$ is the change in current liabilities, $\Delta STD_{i,t}$ is the change in short-term debt included in current liabilities, and $DEP_{i,t}$ is depreciation and amortization expenses, scaled by lagged total assets ($TA_{i,t-1}$); $\Delta REVENUES_{i,t}$ is computed as the change in sales minus receivables scaled by lagged total assets; $PPE_{i,t}$ is property, plant and equipment scaled by lagged total assets.

Since the probability of a stock crash in year *t* is likely to be positively correlated with crashes in year *t-1*, we add $NSKEWN_{t-1}$ and $DUVOL_{t-1}$ to our set of control variables. In our main regressions we also include country, λ_k, industry, η_j, and year, γ_t, dummies to control for invariant characteristics across these dimensions. Because of this fixed effects framework, some of the coefficients in equation (2) drop out due to collinearity. We cluster standard errors at both country- and year-level.

Table 2 reports descriptive statistics for all the variables described above.

[Insert Table 2 here]

[6] Equation (3) is run separately by industry. We assign firms to industries using the classification scheme of Fama and French (1997), based on 48 industry portfolios.

3.3 Stock Price reaction around Earnings Announcements

Per hypothesis 2, cross-delisted firms should experience higher abnormal returns in the post-cross-delisting period. To perform this additional analysis, we adopt the Propensity Score Matching (PSM) methodology proposed by Rosenbaum and Rubin (1983), to match each treatment firm with a control firm with identical pre-treatment characteristics (industry, country, year, and log of total assets). Treatment group includes all firms in our sample that have cross-delisted at some point between year 2000 and year 2012, and control group includes all firms that remained cross-listed firms over the sample period. Propensity score was performed using the nearest neighbor algorithm with replacement[7], which allows that a control (cross-listed) firm can be used more than once as a match. Following Bailey, Karolyi and Salva (2006), we adopt as covariates the log of total assets, sales growth, market to book ratio and the total debt to total assets ratio. Table 3 shows the number of earnings announcements events by country.

[Insert Table 3 here]

We observe in Table 3 that the number of countries shorten from 38 in the former analysis to 30 because of the lack of information about earnings announcements for the major part of the firms included in our sample. Thus, we count a total of 1797 earnings events that correspond to 219 firms over the sample period. Most of the events are concentrated in Common Law countries (as is the case Canada and United Kingdom).

To perform event studies around earnings announcements, we estimate abnormal returns as log-differences. Following previous literature (e.g., Kim and Verrecchia (1991a), Bailey, Karolyi and Salva (2006)), we use the absolute value of abnormal returns to measure return volatility. Our estimation window is (-200, -11) relative to the announcement day (event day 0) to be consistent with previous studies (e.g., Bailey, Karolyi and Salva (2006)). Abnormal returns are firm-specific daily returns estimated from the market model using the local market index. Table 4 presents the

[7] We apply matching technique with nearest neighbor and caliper, which corresponds to 0.2 of propensity score standard deviation (see Wang *et al.*, 2013). The quality of matching is tested using the Likelihood-Ratio (LR) chi^2 test; if the propensity score model is the most suitable one, the coefficients of such specification should not be statistically significant.

results of the event study of absolute abnormal for the entire sample composed by 294 post-cross-delisting events, 544 pre-cross-delisting events, and 959 events for control firms that remained cross-listed over our sample period. The event window is the interval (-5,+5).

[Insert Table 4 here]

We can observe in Table 4 that absolute abnormal return volatility is higher in the post-cross-delisting period relative to pre-cross-delisting period. And this interpretation is extensible when we compare post-cross-delisted absolute abnormal returns with control group; absolute abnormal return volatility is higher in the post-cross-delisting period than in the control group.

Statistical significance displayed by asterisks next to medians indicates whether there is abnormal performance based on the nonparametric Wilcoxon rank test. We observe in Table 4 that most of the significance is concentrated on post-cross-delisting group, which corroborates our initial interpretation.

As an additional test, we follow prior studies (e.g., Bailey, Karolyi and Salva (2006)) and perform univariate tests of absolute abnormal returns in event windows of (-1, +1) and (-5, +5) around earnings announcements for the three groups; i) post-cross-delisting group; ii) pre-cross-delisting group; and iii) control group composed by cross-listed firms that remained listed over the sample period (2000-2012). Table 5 reports the results.

[Insert Table 5 here]

Table 5 reports results for the all sample ("All"), for "Emerging" countries according to Standard and Poor's Emerging Market Database (identified in Table 3 with an asterisk), and for groups classified according to the origin of law and in terms of economic development. We follow literature (e.g., La Porta *et al.* (1997; 1998), La Porta, Lopez-De-Silanes and Shleifer, (2008), Djankov *et al.* (2008)) and assign firms according to the legal origin, i.e., from Common Law countries in the high group of shareholder protection and firms from Civil Law countries in the low group. Similarly, we assign firms into two groups– high and low – in terms of the economic development of their home countries, depending on whether GDP per capita is above (high group) or below (low group) the median value of all countries in the sample. This classification is consistent with the notion that the enforcement and quality of national institutions is correlated with economic development of the countries (La Porta, Lopez-De-Silanes and Shleifer, 2008).

The results in Table 5 suggest that absolute abnormal return volatility is higher in the post-cross-delisting period relative to pre-cross-delisting period, and also relative to the control group for the all sample. This corroborates our previous findings. These results are also similar for the Emerging group. However, results suggest that cross-delisted firms assigned in the high group of the Origin of the Law register higher absolute abnormal returns than in the pre-cross-delisting period relative to the pre-delisting period, but lower than the matched group of control firms. In terms of economic development measured by of GDP per capita, absolute abnormal return volatility is lower in the post-cross-delisting period relative to the pre-cross-delisting period, and also relative to the matched group of control firms On the contrary, firms assigned in the low group of the Origin of the Law and in the low group of GDP per capita display higher absolute abnormal returns in the post-cross-delisting period relative to the pre-delisting period and relative to the matched group of control firms. These results are consistent with the idea that firms from countries with stronger investor protection and better quality of their information environment, i.e., higher disclosure requirements, do not benefit so much from a U.S. listing as firms from more opaque information environment countries.

4. EMPIRICAL RESULTS

4.1 Earnings Management and Crash Risk

To test empirically hypothesis 1a, we estimate various specifications of equation (2). Our purpose is to examine if cross-delisted firms that engage in earnings management post-cross-delisting experience an increase in crash risk. Therefore, our main coefficient of interest is $\beta_4(EM_{i,t-1} \times Delist_{i,t} \times Treat_i)$, which captures the change in crash risk associated with earnings management in the post-cross-delisting period for the treatment group relative to the control group of cross-listed firms. We expected this coefficient to be positive and statistically significant. Table 6 reports the results.

[Insert Table 6 here]

In models (1) through (3) of Panel A, Table 6, we present results using *NSKEWN*, while in models (4) through (6) we show results for the alternate measure *DUVOL*. We find a positive and statistically significant coefficient β_4 in our regressions using *NSKEWN*, but not using *DUVOL*. As an example, results in model (1) show that cross-delisted firms with discretionary accruals above-median in their country experience an increase in crash risk, post-cross-delisting, of 0.074[8] that corresponds to 8.5% of the standard deviation (0.872), while experience a significant change in crash risk of -0.028[9] in the pre-cross-delisting period. We run different specifications of equation (2) to check the robustness of the baseline model. In models (2) and (5) we use firm fixed effects. The economic magnitude of the coefficient β_4 in model (2) is larger than the baseline but in estimation (5) it remains insignificant. To mitigate the possibility that our baseline results are driven by differences in firm characteristics between treated and control group, we re-estimate equation (2) using a matched sample of treatment and control firms. Once, we adopt the Propensity Score Matching (PSM) methodology, to match each treatment firm with a control firm (by industry, country, year, and log of total assets). Propensity score was performed using the nearest neighbor algorithm with replacement. Thus, models (3) and (6) are estimated using matched samples; the results are similar in sign to the baseline results, although of different economic magnitude.

Taken altogether, we find partial evidence to support hypothesis 1a, i.e. that the sensitivity of stock prices crashes increases post-cross-delisting for the average cross-delisted firm. Although the two main variables of crash risk – *NSKEWN* and *DUVOL* – are highly correlated (0.82), the results are only statistically significant for the first measure (*NSKEWN*). One possible reason is that differences in economic, institutional, and regulatory environments might undermine our results. We account for such differences in hypothesis 1b. Consistent with Leuz, Nanda and Wysocki (2003), weak investor protection and weak financial reporting standards give managers

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[8] The sum of coefficients $\beta_1 EM_{i,t}$+$\beta_4 EM_{i,t-1} \times Delist_{i,t} \times Treat_i$+$\beta_6 EM_{i,t-1} \times Treat_i$=-0.0050+0.1020+-0.0233=0.0737 and the *p*-value of the *F*-test for the significance of the sum is 0.0991.

[9] The sum of coefficients $\beta_1 EM_{i,t}$+$\beta_6 EM_{i,t} \times Treat_{i,t}$=-0.0050+-0.0233=-0.0283 and is statistically significant at the 5 percent level (*p*-value of the *F*-test 0.0475).

more latitude to manipulate earnings reporting. On the contrary, countries with stronger degrees of legal investor protection tend to be associated with lesser degrees of earnings management. Motivated by this literature, we test our hypothesis 1b that the increase in stock crash risk associated with earnings management post-cross-delisting should be stronger for foreign firms from less developed countries and countries with weaker shareholder protection. Thus, we re-estimate equation (2) separately for countries with high (low) investor protection and high (low) economic development. Once, we follow literature (e.g., La Porta *et al.* (1997; 1998), La Porta, Lopez-De-Silanes and Shleifer, (2008), Djankov *et al.* (2008)) and assign firms according to the legal origin; i) firms from Common Law countries in the *high* group of shareholder protection, and ii) firms from Civil Law countries in the *low* group. Again, we assign firms into in terms of the economic development of their home countries - *high* and *low* – depending on whether GDP per capita is above (high group) or below (low group) the median value of all countries in the sample. Panel B of Table 6 shows the results.

As we expected, both measures of crash risk (*NSKEWN* and *DUVOL*) are positively correlated with earnings management in the post-cross-delisting period for firms ranked in the low groups, being insignificant for firms ranked in the high groups. Regarding the legal system, we observe that for cross-delisted firms from countries with weaker shareholder protection - models (2) and (4) - coefficient β_4 is positive and statistically significant using any of the alternate crash risk measures. Results are similar in sign and economic magnitude for the subsample of firms from less economically developed countries – models (6) and (8). Taking coefficients in model (2) as an example, the results show that cross-delisted firms with discretionary accruals above-median from countries with weaker investor protection have an increase in crash risk of 0.27[10] (or 30% of its standard deviation)[11], post-cross-delisting, compared to the control group of cross-listed firms from countries with similar legal environment. This result is consistent with the view that cross-delisted firms from countries with stronger legal systems, stronger investor protection rules, and

[10] The sum of coefficients $\beta_1 EM_{i,t-1}+\beta_4 EM_{i,t-1} \times Delist_{i,t} \times Treat_i+\beta_6 EM_{i,t-1} \times Treat_i$=-0.0835+0.2958+0.0563=0.269 and the *p*-value of the *F*-test for the significance of the sum is 0.0991.

[11] For this subsample, the standard deviation of *NSKEWN* is 0.9079.

stricter disclosure standards are less likely to engage in earnings management, and consequently, are less prone to experience stock price crashes.

Overall, our evidence is consistent with the idea that, after cross-delisting from a U.S. stock exchange, firms from countries with weaker shareholder protection suffer a deterioration in their corporate governance standards, which can be interpreted as a reverse "bonding" effect. In this study, we document an increase in crash risk associated with earnings management, which might be a consequence of that deterioration in the firms' corporate governance.

Additionally to country-level factors that may affect the overall quality of the firms' information environment, we also analyze, under hypothesis 1b, firm-specific characteristics that may as well affect the quality of their information environment. Managers in more opaque firms may find it easier to withhold the disclosure of bad news, increasing the probability of a subsequent stock price crash (e.g., Jin and Myers (2006)). Thereby, our hypothesis 1b predicts that the sensitivity of crash risk to earnings management in the post-cross-delisting period should be higher for more opaque firms. i.e., those with higher levels of information asymmetry. To test this hypothesis, we use two alternate proxies of information asymmetry. Our first proxy is the bid-ask spread, which is positively correlated with information asymmetry (e.g., Brennan and Subrahmanyam (1996)). We measure bid-ask spread as the annual median of the daily difference between ask and bid prices, scaled by the midpoint. Our second proxy is the change in R&D expenses. Aboody and Lev (2000) argue that R&D expenses contribute to information asymmetry between insiders and outsider investors due to the scarcity of public information on R&D activity and its impact on firm's value. Using these two proxies, we create an indicator variable, INF, that is equal to one for firms with information asymmetry above the median in their countries, and zero otherwise. This indicator of poor information environment is restricted to the interval (t-3; $t+3$), relative to cross-delisting year. Then, we create a triple interaction variable that captures earnings management and the information environment quality in the post-cross-delisting period, $EM \times Delist \times INF$. We estimate equation (5) considering only the treatment group to mitigate mixed and confounding effects.

$$Crash\ Risk_{i,t} = \alpha_i, +\beta_1 EM_{i,t-1} + \beta_2 Delist_{i,t} + \beta_3 INF_{i,t} + \beta_4 EM_{i,t-1} \times Delist_{i,t} \times INF_{i,t} + \beta_5 EM_{i,t-1} \times Delist_{i,t} + \beta_6 EM_{i,t-1} \times INF_{i,t} + \beta_7 Delist_{i,t} \times INF_{i,t} + \gamma_1 (Control\ firm\_level_{i,t-1}) + \lambda_k + \eta_j + \gamma_t + \varepsilon_{i,t} \quad (5)$$

where $Crash\ Risk_{i,t}$ is the dependent variable that corresponds to the two alternate measures of crash risk explained above (*NSKEWN* and *DUVOL)* for firm *i*, in year *t*. *NSKEWN* is the negative one multiplied by the skewness of firm-specific weekly returns in a given year. *DUVOL* - "down-to-up" volatility – is the standard deviation of below the mean weekly firm-specific returns divided by the standard deviation of above the mean weekly firm-specific returns in a given year. $EM_{i,t-1}$ is an indicator variable that equals one for firms above median of discretionary accruals in their country and zero otherwise. $Delist_{i,t}$ is an indicator variable equal to one starting in $t+1$ relative to delisting event in year *t*, and 0 otherwise. $INF_{i,t}$ is an indicator variable that is equal to one for firms above the median in their countries for each measure of information asymmetry (bid-ask spread and R&D), and 0 otherwise. $\gamma(\cdot)$ is a vector of the following control variables as described before: $TURN_{i,t-1}$ is the change in the average monthly share turnover in the previous year; $SIZE_{i,t-1}$ is the natural logarithm of the market value of equity in year *t-1*; $STDEV_{i,t-1}$ is the standard deviation of weekly firm-specific returns in year *t-1*; $RETURN_{i,t-1}$ is the average weekly firm-specific return in year *t-1*; $ROA_{i,t-1}$ is the net income before extraordinary items scaled by total assets in year *t-1*; $LEVERAGE_{i,t-1}$ total debt scaled by total assets in year *t-1*; $ALPHA_{i,t-1}$ is the natural logarithm of one plus the intercept (alpha) estimated from equation (1) in the prior year; $MB_{i,t-1}$ is the market value of equity divided by the book value of equity in year *t-1*; $DISACCRUAL_{i,t-1}$ is the absolute value of discretionary accruals, estimated according the modified Jones' (1991) Model (Dechow, Sloan and Sweeney 1995), defined as before in equation (3). We also include crash risk variables in year *t-1, NSKEWN* $_{t-1}$ and *DUVOL*$_{t-1}$. Table 7 displays the results.

[Insert Table 7 here]

The results in Table 7 provide evidence that firms with higher levels of information asymmetry are more prone to stock price crashes associated with earnings management post-cross-delisting.

The coefficient β_4 is statistically significant in all models. As an example, we observe in model (1) that cross-delisted firms with above-the-median discretionary accruals and poor information environment experience a significant increase in crash risk of 0.183[12] that correspond to 19% of the standard deviation[13], whereas in the pre-cross-delisting the change in cash risk is -0.137[14]. As predicted by hypothesis 1b, firms with higher levels of information asymmetry that engage in earnings management after cross-delisting tend to have significantly higher crash risk. Again, a possible explanation for such effect may be the fact that after cross-delisting firms no longer will be under the stringent disclosure requirements imposed by SEC and by others U.S. institutions. Overall, our results provide evidence supporting hypothesis 1b.

4.2 Stock Price Reaction around Earnings Announcements: Cross-sectional regressions

Our results so far suggest that, after cross-delisting, firms that engage in earnings management experience an increase in crash risk, in particular when their specific information environment is weaker (either because they are more opaque or the quality of their national institutions is poorer). In this section, we analyze a particular corporate event – the issuance of new equity – that has been shown to be highly related with the practice of earnings management (e.g. Teoh, Welch and Wong (1998), Cohen and Zarowin (2010)) and with subsequent stock crashes (e.g. Hutton, Marcus and Tehranian (2009)). Per our hypothesis 2, we expect that, after cross-delisting, the absolute abnormal return volatility increase, especially for firms from countries with poorer disclosure standards, which raise a higher degree of information asymmetry among investors. We follow Bailey, Karolyi and Salva, 2006, and estimate several different specifications of a cross-section regressions to explain the absolute cumulative abnormal return for two event windows (-1, 1) and (-5, +5) around earnings events. Besides the Origin of Law and GDP per capita already explained,

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[12] The sum of coefficients $\beta_1 EM_{i,t-1}$+$\beta_4 EM_{i,t-1} \times Delist_{i,t} \times INF_{i,t} + \beta_5 EM_{i,t-1} \times Delist_{i,t} + \beta_6 EM_{i,t-1} \times INF_{i,t}$=-0.0290+0.3527+-0.0327+-0.1664=0.1826 and the *p*-value of the *F*-test for the significance of the sum is 0.0116.

[13] For treatment group the standard deviation of *NSKEWN* is 0.9387.

[14] The sum of coefficients $\beta_1 EM_{i,t-1} + \beta_6 EM_{i,t-1} \times INF_{i,t}$=0.0290+-0.1644=-0.1374 and is statistically significant (*p*-value of the *F*-test 0.0222).

we also include the *Disclosure* requirements index proposed by La Porta, Lopez-De-Silanes and Shleifer (2006) as a proxy for the quality of information environment.

To analyze the impact of firm-specific earnings attributes, we use the number of analysts that follow each firm, analysts' forecast dispersion, and absolute earnings surprise measured as the difference between actual earnings and median analyst forecast.

We interact all the above variables with a dummy variable *Delist*, that equals one for cross-delisted firms in the post-cross-delisting period. Table 8 displays the results.

[Insert Table 8 here]

We observe in Table 8 that the coefficient of dummy variable *Delist* is positive and statistically significant for most regressions, which is consistent with the results provided by univariate analysis that suggest the absolute abnormal returns of the overall sample increase in the post-cross-delisting period. Also the coefficient of *DISCLOSURE* is positive and statistically significant in all regressions, which means that abnormal returns are explained in part by the degree of the disclosure requirements. However, the coefficient that captures the changes in the post-cross-delisting period (*Delist x DISCLOSURE*) is negative and statistically significant across estimations, which might suggests that investors decisions do not rely so much in public information disclosed by firms after the cross-delisting. The other two country-level variables display opposite signs. The coefficient of the *Origin of Law* is positive and is, on average, statistically significant. Also, similar results are found for the coefficient of *Delist x ORIGIN,* meaning that the legal origin impacts abnormal returns. On the other side, the variables *GDP per capita* and *Delist x GDP per capita* present negative and statistically significant coefficients' estimates in most regressions. This finding is consistent with the idea pointed out by Bailey, Karolyi and Salva (2006), that firms from more economically developed countries display lower volatility reactions around earnings announcements. However, and opposite to their findings, our results show that lower volatility remains in the post-cross-delisting period.

The coefficients of firm-specific variables, as the number of analysts, analysts' forecast dispersion, and absolute earnings surprise are not statically significant in most cases. This reinforce the important of institutional framework quality and information environment to explain abnormal returns.

Taken together, results of univariate analysis and regression analysis provide support of hypothesis 2; post-cross-delisted firms experience higher abnormal returns around earnings announcements, especially those from countries with poor institutional quality and firms with more opaque information environment.

5. MAIN CONCLUSIONS

In this study, we examine whether cross-delisted firms from the major U.S. stock exchanges experience an increase in crash risk associated with earnings management post-cross-delisting. We test our research hypotheses using a treatment sample of 583 cross-delisted firms from U.S. stock exchange markets (from 38 countries) and a control group of 564 cross-listed firms. We employ different regressions techniques and alternate measures of crash risk. As expected, we uncover a significant increase in crash risk associated with earnings management for cross-delisted firms after the cross-delisting event, which is more pronounced when firms are from countries with weaker shareholder protection (namely, Civil Law countries) and countries with lower GDP per capita. Thus, our evidence is consistent with the idea that cross-delisted firms from countries with weaker shareholder protection suffer a deterioration in their corporate governance levels after leaving the U.S. stock exchanges.

Furthermore, we analyze how information asymmetry at firm-level impacts the sensitivity of crash risk to earnings management. As we predicted, more opaque firms with higher levels of information asymmetry experience an increase in crash risk associated with earnings management.

We also examine the stock price reaction around earnings announcements in the post-cross-delisting period relative to the pre-cross-delisting period, and also relative to a matched control group of cross-listed firms. Our results show that post-cross-delisted firms display higher absolute abnormal returns volatility around earnings announcements than in the pre-cross-delisting period;

those findings are stronger for firms from countries with poor institutional quality and firms with more opaque information environment.

Taken together, our results are consistent with the prediction that after a cross- delisting from a U.S. stock exchange, managers are more motivated to manipulate financial information, particularly in weaker legal regimes. We interpret this as a reverse "bonding" effect; cross-delisted firms suffer a deterioration in their corporate governance standards in the post-cross-delisting because they are no longer subject to the SEC regulations nor under the surveillance of others U.S. Institutions.

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Appendix A - Definitions and Sources of the variables

VARIABLE	DEFINITION	SOURCE
Firm-level		
ABRET	Abnormal returns measured as log-differences	Datastream
Actual Earnings	Actual earnings	I/B/E/S
ALPHA	Logarithm of one plus the intercept (alpha) estimated from equation (1).	Datastream
Analyst forecast	Median analyst earnings forecast	I/B/E/S
Analysts	The number of analysts that follows each firm	I/B/E/S
Bid-Ask spread	Yearly median of the daily difference between ask and bid prices, scaled by the mean of ask and bid prices.	Datastream
CRASH	Indicator variable that equals one if a firm experiences one or more stock price crashes during the current year *t* and zero otherwise. For a firm *i* in year *t*, a stock price crash is identified if the firm-specific weekly return is 3.09 or more standard deviations below the mean of that same year.	Datastream
CRASH_ DUVOL	Indicator variable that equals one for firms above their country's median for variable DUVOL and zero otherwise.	Datastream
CRASH_ NSKEW	Indicator variable that equals one for firms above their country's median for variable NSKEWN and zero otherwise.	Datastream
Delist	Dummy variable that equals one if a firm is delisted from U.S. exchange markets (NYSE or NASDAQ) in a given year, and zero otherwise.	SEC website, Datastream and Citibank
DISACCR	The absolute value of total accruals estimated via modified Jones (1991) Model, as in Dechow, Sloan and Sweeney (1995): $$\frac{ACCRUALS_{i,t}}{TA_{i,t-1}} = \alpha_0 \frac{1}{TA_{i,t-1}} + \beta_1 \frac{\Delta REVENUES_{i,t}}{TA_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{TA_{i,t-1}}$$ where $ACCRUALS_{i,t} = (\Delta CA_{i,t} - \Delta CASH_{i,t}) - (\Delta CL_{i,t} - \Delta STD_{i,t}) - DEP_{i,t}$, $\Delta CA_{i,t}$ is the change in current assets, $\Delta CASH_{i,t}$ is the change in cash and equivalents of cash, $\Delta CL_{i,t}$ is the change in current liabilities, $\Delta STD_{i,t}$ is the change in short-term debt included in current liabilities, and $DEP_{i,t}$ is depreciation and amortization expenses, scaled by lagged total assets $TA_{i,t-1}$; $\Delta REVENUES_{i,t}$ is computed as the change in sales minus receivables scaled by lagged total assets; $PPE_{i,t}$ is property, plant and equipment scaled by lagged total assets. Discretionary accruals are then estimated as the residuals from equation (3).	Worldscope

VARIABLE	DEFINITION	SOURCE
	$\text{DISACCR} = \frac{\text{TACCR}_{i,t}}{\text{TA}_{i,t-1}} - \left(\widehat{\alpha}_0 \frac{1}{\text{TA}_{i,t-1}} + \widehat{\beta}_1 \frac{\Delta\text{REVENUES}_{i,t}}{\text{TA}_{i,t-1}} + \widehat{\beta}_2 \frac{\text{PPE}_{i,t}}{\text{TA}_{i,t-1}}\right)$	
DUVOL	"Down-to-up" volatility defined as the standard deviation of below the mean weekly firms-specific returns in year *t* divided by the standard deviation of above the mean firm-specific return in year *t*.	Datastream
Earnings Announcements	Earnings announcements dates	I/B/E/S
EM (Earnings Management)	Indicator variable that equals one for firms above median of discretionary accruals in their countries and zero otherwise.	Worldscope
INF (Information)	Indicator variable that equals one for firms with above country's median for each measure of information asymmetry (bid-ask spread and R&D). This indicator of information environment is restricted to the interval (t-3; t+3), relative to cross-delisting in year *t*.	Datastream and Worldscope
LEVERAGE	Total debt (short-term debt plus long-term debt) divided by total assets.	Worldscope
Log Total Assets	Logarithm of total assets.	Worldscope
MB	The market value of equity divided by the book value of equity.	Worldscope
NSKEWN	Negative skewness defined as negative one multiplied by the skewness of the firm-specific weekly returns over a given year.	Datastream
R&D	Changes in research and development (R&D) expenses. R&D is set to zero when it is missing.	Worldscope
RETURN	Yearly average of the firm's weekly firm-specific log-returns.	Datastream
ROA	Net income before extraordinary items divided by total assets.	Worldscope
SEO	Indicator variable that equals one if a firm conducted a public seasoned equity offering in its home country in the prior year, and zero otherwise.	SDC
SIZE	Logarithm of market value of equity.	Worldscope
STDEV	Yearly standard deviation of weekly firm-specific returns.	Datastream
SURPRISE	Difference between actual earnings and median analyst forecast	I/B/E/S
Total Assets (TA)	Total Assets in U.S. dollars, converted at fiscal year-end exchange rates.	Worldscope

VARIABLE	DEFINITION	SOURCE
Treat	Indicator variable that equals one if a firm is included in the treatment group, and zero otherwise. Treatment group includes all firms that cross-delist at some point in time over 2000-2012.	SEC website, Datastream and Citibank
TURN	Annual change in the average monthly share turnover between t-1 and t-2. Monthly share turnover is defined as monthly trading volume (shares) divided by total number of shares outstanding during that month.	Datastream
Industry-Level		
INDUSTRY	Classification scheme proposed by Fama and French (1997), based on 48 Industry Portfolios.	Fama and French (1997)
SIC CODE	4-digit Standard Industrial Classification (SIC) Code.	Datastream
Country-Level		
GDP per Capita	Logarithm of GDP per capita.	Worldbank
Legal Origin	Indicator variable that equals one for Common Law (Civil Law) countries and zero otherwise.	La Porta, Lopez-De-Silanes and Shleifer (2008)

TABLE 1: Frequency of Stock Price Crashes

Table 1 reports the frequency of stock price crashes for our sample divided by treatment and control group across 2000-2012 period. The treatment sample consists of 583 cross-delisted firms (4,192 firm-year observations) from 38 countries and the control group consists of 564 cross-listed firms (4,900 firm-year observations). For a firm *i* in year *t*, a stock price crash is identified if the firm-specific weekly return is 3.09 or more standard deviations below the mean of that year. Firm-specific return for firm *i* in year *t* is estimated using the market model from equation (1) and is computed as the logarithm of one plus firm-specific return. Panel A describes by year and by treatment (pre- and post-cross-delisting) and control group the number ("No.") of firms that experienced stock price crashes and the proportion of firms that experienced stock price crashes (expressed in %). Panel B shows the proportion of treatment firms that experienced stock price crashes pre- and post-cross-delisting over 2000-2012. Panel C shows the proportion of treatment and control firms that experienced stock price crashes over 2000-2012. Differences are expressed in percentage points (pp) and are tested using *t*- statistic test (in parentheses). ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively.

Panel A – Frequency of Stock Price Crashes

	No. Firms with Stock Price Crashes			% Firms with Stock Price Crash		
	Treatment		Control	Treatment		Control
	PRE	POST		PRE	POST	
2000	53	0	23	13.5%	0.0%	13.5%
2001	85	3	43	21.6%	17.6%	21.6%
2002	90	9	59	25.0%	24.3%	25.0%
2003	57	8	34	17.4%	16.7%	17.4%
2004	63	13	47	19.7%	21.7%	19.7%
2005	59	20	62	20.6%	26.0%	20.6%
2006	45	16	57	18.1%	18.4%	18.1%
2007	47	28	75	28.1%	19.2%	28.1%
2008	45	48	102	37.5%	31.4%	37.5%
2009	13	36	97	15.1%	24.2%	15.1%
2010	14	28	56	23.7%	18.2%	23.7%
2011	5	45	85	17.9%	30.2%	17.9%
2012	0	39	110	0.0%	26.2%	0.0%
Total	*576*	*293*	*850*	*19.5%*	*23.8%*	*17.3%*

Panel B – Univariate Comparisons: Pre- and Post-Cross-Delisting

	Pre	**Post**	**Difference**
No. Firm-years with Stock Price Crashes	576	293	

% Firms with Stock Price Crashes	19.5%	23.8%	**-4.3pp** ***
t-test			(18.95)

Panel C – Univariate Comparisons: Treatment and Control Group

	Treatment	**Control**	**Difference**
No. Firm-years with Stock Price Crashes	869	850	
% Firms with Stock Price Crash	20.7%	17.3%	**3.4pp** ***
t-test			(22.44)

TABLE 2: Descriptive Statistics

Table 2 provides descriptive statistics for the full sample over 2000-2012. The treatment sample consists of 583 cross-delisted firms (4,192 firm-years observations) from 38 countries and the control group consists of 564 cross-listed firms (4,900 firm-year observations). We exclude financial firms (SIC codes between 6000 and 6999) and utilities (SIC codes between 4900 and 4949) and firm-year observations with total assets under $10 million and with negative or missing information on total assets, sales, market and book value of equity. For each variable, we report the number of observations ("N"), the mean, the 25^{th} percentile ("25th pctl"), the median, the 75^{th} percentile ("75th pctl"), and the standard deviation ("Std. dev."). *NSKEWN* is the negative one multiplied by the skewness of firm-specific weekly returns in a given year. *DUVOL* - "down-to-up" volatility – is the standard deviation of below the mean weekly firm-specific returns divided by the standard deviation of above the mean weekly firm-specific returns in a given year. *TURN* is the yearly change in the average monthly share turnover in year *t-1*. *SIZE* is the logarithm of the market value of equity in year *t-1*. *STDEV* is the standard deviation of weekly firm-specific returns in year *t-1*. *RETURN* is the logarithm of one plus the residual estimated from equation (1) in year *t-1*. *ROA* is the net income before extraordinary items scaled by total assets in year *t-1*. *LEVERAGE* is the total debt scaled by total assets in year *t-1*. *ALPHA* is the natural logarithm of one plus the intercept (alpha) estimated from equation (1) in year *t-1*. *MB* is the market value of equity divided by the book value of equity in year *t-1*. *DISACCR* is the absolute value of discretionary accruals, estimated using the modified Jones' (1991) model (Dechow, Sloan and Sweeney, 1995) in year *t-1*. All variables are defined in Appendix A.

	Full Sample					
	N	Mean	25th pctl.	Median	75th pctl.	Std. dev.
NSKEWN	9,092	-0.1467	-0.5745	-0.1552	0.2645	0.8721
DUVOL	9,092	1.0338	0.7938	0.9762	1.2035	0.3657
TURN	8,124	-0.0024	-0.0126	-0.0002	0.0111	0.0576
SIZE	9,092	13.6840	11.9576	13.6663	15.4462	2.3109
STDEV	9,092	0.0627	0.0355	0.0524	0.0779	0.0388
RETURN	9,092	-0.0033	-0.0076	-0.0020	0.0024	0.0106
ROA	9,092	-0.0077	-0.0313	0.0333	0.0770	0.1748
LEVERAGE	9,092	0.2287	0.0367	0.2075	0.3542	0.2009
ALPHA	9,902	0.0006	-0.0323	0.0003	0.0055	0.0110
MB	9,092	2.7950	1.0630	1.8384	3.2989	3.8576
DISACCR	9,092	0.0000	-0.0348	0.0023	0.0361	0.0802

TABLE 3: Earnings Announcements Events by Country

Table 3 describes the number of cross-delisted firms in the pre- and post-cross-delisting period and the number of the control group composed by cross-listed firms. Each group reports the number of earnings announcements events firms ("Nr. Events"). Post-cross-delisting group includes all firms that cross-delisted at some point in time over 2000-2012 Treatment group includes all firms that are exposed to a treatment, i.e., cross-delisting. Control group includes all cross-listed firms in the sample. *Denotes a country designated as an emerging market by Standard and Poor's Emerging Market Database.

Group:	**Treatment**		**Control**
	Post-Cross-Delisting	**Pre-Cross-Delisting**	**Cross-Listed**
Country:	**Nr. Events**	**Nr. Events**	**Nr. Events**
Argentina*	0	0	7
Australia	5	11	6
Brazil*	0	0	50
Canada	49	131	173
Chile*	13	15	6
China*	0	19	167
Denmark	6	13	0
Finland	0	0	6
France	8	18	29
Germany	32	28	47
Greece	0	4	25
Hong Kong	7	27	37
India*	1	10	4
Ireland	11	2	19
Israel	13	40	93
Italy	12	0	0
Japan	5	7	19
Korea*	2	7	9
Luxembourg	3	22	9
Mexico*	16	21	13
Netherlands	18	32	28
New Zealand	9	4	14
Norway	4	2	11
Portugal	0	0	2
Russia*	5	7	0
Sweden	0	5	0
Switzerland	10	0	9
Taiwan	0	0	28
Turkey*	0	0	13
United Kingdom	65	119	135
All Countries	**294**	**544**	**959**

TABLE 4: Univariate comparisons of absolute abnormal returns around earnings announcement pre- and post-cross-delisting

Table 4 reports absolute abnormal returns around earning announcements both before and after cross-listing of the U.S. markets, as well as for a benchmark sample of cross-listed firms. Abnormal returns are daily firm-specific returns estimated from a one-factor market model. The estimation window is the interval (-200, -11). The abnormal returns sample includes 294 post-cross-delisting events, 544 pre-cross-listing events, and 959 events for the control firms. Differences in medians are tested using Wilcoxon rank sum test ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively.

	Treatment						**Control**		
	Post-Cross-Delisting			**Pre-Cross-Delisting**			**Cross-Listed**		
Day:	Mean	Median		Mean	Median		Mean	Median	
-5	0.0151	0.0090		0.0184	0.0108		0.0176	0.0090	
-4	0.0138	0.0072	*	0.0199	0.0109		0.0180	0.0097	**
-3	0.0155	0.0083	**	0.0189	0.0107		0.0168	0.0079	
-2	0.0150	0.0074		0.0194	0.0095		0.0177	0.0090	
-1	0.0142	0.0079		0.0195	0.0113		0.0170	0.0091	
0	0.0166	0.0095	**	0.0211	0.0121		0.0190	0.0099	
1	0.0160	0.0101		0.0213	0.0105		0.0185	0.0099	
2	0.0159	0.0082		0.0190	0.0109		0.0187	0.0091	
3	0.0144	0.0074		0.0195	0.0105	**	0.0174	0.0094	**
4	0.0146	0.0078	***	0.0207	0.0121	**	0.0168	0.0091	**
5	0.0132	0.0070		0.0205	0.0107		0.0167	0.0090	

TABLE 5: Univariate tests on absolute cumulative abnormal returns before and after international cross-delistings: Univariate Comparisons

Table 5 presents means and medians of absolute cumulative abnormal returns around earning announcements both before and after cross-listing of the U.S. markets, as well as for a benchmark sample of cross-listed firms. Cumulative abnormal returns are estimated for a three-day window in panel A (-1, +1) and eleven-day window in panel B (-5, +5). The number of events is indicated for each group. Differences in means are tested using *t*-statistic test and differences in medians are tested using Wilcoxon rank sum test. ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively

Panel A: Absolute cumulative abnormal return (-1,+1)

	Treatment						Control		
	Post-Cross-Delisting			**Pre-Cross-Delisting**			**Cross-Listed**		
Group:	Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median
All	294	0.0186	0.0233	544	0.0139	0.0080	954	0.0027 ***	0.0085
Emerging	37	0.1066	0.0719	83	0.1029	0.0716	317	0.0186 ***	0.0220 ***
<u>Legal Origin</u>									
High	160	0.0170	0.0122	344	0.0007 **	0.0036 *	481	0.0194 **	0.0242 *
Low	75	0.0760	0.0719	119	0.0402 **	0.0719	173	0.0492 ***	0.0515 ***
<u>GDP per Capita</u>									
High	147	0.0035	0.0061	278	0.0254	0.0118 *	347	0.0165	0.0242 **
Low	147	0.0406	0.0277	266	0.0551	0.026	607	0.0051 ***	0.0145 **

Panel B: Absolute cumulative abnormal return (-5,+5)															
	Treatment								Control						
	Post-Cross-Delisting			**Pre-Cross-Delisting**					**Cross-Listed**						
Group:	Obs.	Mean	Median	Obs.	Mean		Median		Obs.	Mean		Median			
All	294	0.0370	0.0200	544	0.0178	**	0.0234	***	954	0.0195	***	0.0209	***		
Emerging	37	0.0103	0.0655	83	0.0641	**	0.0001	***	317	0.0359	***	0.0172	***		
Legal Origin															
High	160	0.0462	-0.0303	344	0.0284		0.0303		481	0.0663	*	0.0561			
Low	75	0.0458	0.0179	119	0.0340	***	0.0312	***	173	0.0240	***	0.0172	***		
GDP per Capita															
High	147	0.0139	0.0156	278	0.0723		0.0879		347	0.0535	*	0.0475			
Low	147	0.0602	0.0221	266	0.0393	**	0.0104	***	607	0.0006	***	0.0055	***		

TABLE 6: Earnings Management and Crash Risk

Panel A of Table 6 reports regression estimates of equation (2) using different specifications. The dependent variable is one of the two alternate crash risk measures: i) *NSKEWN* is the negative one multiplied by the skewness of the firm-specific weekly returns in a given year; ii) *DUVOL* - "down-to-up" volatility – is the standard deviation of below the mean weekly firm-specific returns divided by the standard deviation of above the mean weekly firm-specific returns in a given year. *EM* is an indicator variable that equals one for firms above median of discretionary accruals in their country, and zero otherwise. *Delist* is an indicator variable that equals one starting in year $t+1$ after the cross-delisting event in year *t*, and zero otherwise. *Treat* is a dummy variable equal to one for firms included in our treatment group, and zero otherwise. The set of control variables includes: *TURN* is the yearly change in the average monthly share turnover in the previous year *(t-1)*; *SIZE* is the logarithm of the market value of equity in year *t-1*; *STDEV* is the standard deviation of weekly firm-specific returns in year *t-1*; *RETURN* is the logarithm of one plus the residual estimated from equation (1) in year *t-1*; *ROA* is the net income before extraordinary items scaled by total assets in year *t-1*; *LEVERAGE* is the total debt scaled by total assets in year *t-1*; *ALPHA* is the natural logarithm of one plus the intercept (alpha) estimated from equation (1) in year *t-1*; *MB* is the market value of equity divided by the book value of equity in year *t-1*; *DISACCR* is the absolute value of discretionary accruals, estimated using the modified Jones' (1991) Model (Dechow, Sloan and Sweeney, 1995) in year t-1. All variables are defined in Appendix A. Country, industry and year fixed effects are included in all regressions, except in models (2) and (4) whereas we only include firm and year fixed effects. In models (3) and (6) we use a matched sample; each firm from treatment group is matched by year, industry, country and with the closest log of total assets, to a firm from the control group of cross-listed firms. Robust *t*-statistics standard errors clustered at both country- and year-level are shown in parentheses. The *p*-value of Likelihood-ratio (LR) test is also reported (in parentheses). The last two rows show the sum and the respectively p-value of the coefficients $[EM + EM \times Delist \times Treat + EM \times Treat]$. Panel B of Table 6 reports regression estimates of equation (2) but performed separately for high (low) groups. We rank firms based on Legal Origin and GDP per capita. Legal Origin is an indicator of institutional quality (e.g., La Porta, Lopez-De-Silanes and Shleifer (2008)); based on this indicator, we assign firms in high (low) group depending if they are from Common (Civil) Law countries. GDP per capita is an economic indicator collected from the World Bank All variables are defined in Appendix A. Regressions include year, industry, and country fixed effects (FE). Robust *t*-statistics with standard errors clustered at both country- and year-level are shown in parentheses. It is also reported the *p*-value of a *z*-test that evaluates whether the coefficient $\beta_4(EM_{i,t-1} \times Delist_{i,t} \times Treat_i)$ of high group is equal to the coefficient of low group. ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively.

Panel A: Earnings Management and Crash Risk						
	Baseline	Firm FE	Matched	Baseline	Firm FE	Matched
Dependent Variable:		*NSKEWN*			*DUVOL*	
	(1)	(2)	(3)	(4)	(5)	(6)
EM_{t-1}	-0.0050	-0.0198	-0.0180	0.0051	0.0002	-0.0048
	(-0.21)	(-0.72)	(-0.33)	(0.55)	(0.01)	(-0.24)
$Delist_t$	-0.0878**	-0.0652	-0.1128***	-0.0577***	-0.0512*	-0.0657***
	(-2.09)	(-0.93)	(-2.98)	(-4.97)	(-1.84)	(-2.80)
$Treat_i$	0.0361		0.0575*	0.0329***		0.0403***
	(1.26)		(1.73)	(3.78)		(3.10)
EM_{t-1} x $Treat_I$ x $Delist_t$	0.1020***	0.1300*	0.0515**	0.0176	0.0411	0.0067
	(2.70)	(1.76)	(2.52)	(0.81)	(1.36)	(0.30)
EM_{t-1} x $Treat_i$	-0.0233	-0.0161	-0.0059	-0.0022	-0.0149	0.0062
	(-0.71)	(-0.32)	(-0.09)	(-0.15)	(-0.74)	(0.27)
$TURN_{t-1}$	-0.1202***	-0.1886	-0.0293	-0.0484	-0.0349	-0.0103
	(-3.96)	(-0.93)	(-0.28)	(-1.02)	(-0.43)	(-0.20)
$SIZE_{t-1}$	0.0647***	0.1958***	0.0763***	0.0240***	0.1177***	0.0279***
	(7.00)	(9.63)	(7.84)	(4.55)	(13.56)	(6.29)
$STDEV_{t-1}$	0.3206	-0.0471	0.4378	0.1861	-0.5019**	0.2100
	(0.43)	(-0.07)	(0.42)	(0.69)	(-2.00)	(0.74)
$RETURN_{t-1}$	3.9595	1.3729	2.0936	-0.8292	-1.0788	-1.6287
	(1.29)	(0.54)	(0.57)	(-0.47)	(-0.97)	(-0.88)
ROA_{t-1}	0.2357***	0.1891*	0.2427***	0.0338**	0.0199	0.0361*
	(3.20)	(1.76)	(3.06)	(2.07)	(0.46)	(1.71)
$LEVERAGE_{t-1}$	0.0013	0.2038	0.0859	0.0066	0.1088**	0.0507*
	(0.02)	(1.57)	(0.96)	(0.20)	(2.02)	(1.77)
$ALPHA_{t-1}$	1.9641	0.5580	3.4332	2.8973***	0.3918	4.0690***
	(1.33)	(0.24)	(1.46)	(3.03)	(0.43)	(3.24)
MB_{t-1}	-0.0041*	-0.0082**	-0.0040	0.0008	-0.0032**	-0.0001
	(-1.67)	(-2.27)	(-1.22)	(0.56)	(-2.23)	(-0.06)
$DISACCR_{t-1}$	-0.0014	0.0937	0.0192	0.0525	0.0673	0.0310
	(0.01)	(0.65)	(0.25)	(0.79)	(1.14)	(0.80)
$NSKEWN_{t-1}$	0.0384*	-0.1064***	0.0244			
	(1.79)	(-6.72)	(1.16)			
$DUVOL_{t-1}$				0.0358*	-0.0984***	0.0420**
				(1.68)	(-5.33)	(2.12)
Constant	-0.9980**	-2.8326***	-1.1868***	0.6474***	-0.4249***	0.3684***
	(-2.53)	(-9.19)	(-5.14)	(4.23)	(-3.21)	(5.11)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	No	Yes	No
Industry FE	Yes	No	Yes	Yes	No	Yes
Country FE	Yes	No	Yes	Yes	No	Yes
Observations	7,027	7,027	4,300	7,027	7,027	4,300
R-squared	0.065	0.058	0.077	0.062	0.09	0.081
PROPENSITY SCORE						
LR chi^2 (p value)			(0.493)			(0.493)
$[EM + EM \times Delist \times Treat + EM \times Treat]$	0.0737*	0.0941*	0.0276*	0.0205	0.0264	0.0081
p-value	(0.099)	(0.0915)	(0.087)	(0.300)	(0.291)	(0.371)

Panel B: Earnings Management and Crash Risk. The impact of institutional quality								
Quality proxy:	Legal Origin				GDP per Capita			
Dependent variable:	*NSKEWN*		*DUVOL*		*NSKEWN*		*DUVOL*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*
EM_{t-1}	0.0072	-0.0835	0.0142	-0.0456*	-0.0145	0.0023	0.0006	0.0084
	(0.19)	(-1.08)	(1.13)	(-1.65)	(-0.37)	(0.05)	(0.05)	(0.47)
$Delist_t$	-0.0341	-0.1873	-0.0349	-0.0895**	-0.0175	-0.2589**	-0.0281	-0.1350***
	(-0.42)	(-1.07)	(-1.07)	(-2.11)	(-0.29)	(-2.52)	(-1.05)	(-6.36)
$Treat_i$	0.0415	0.0453	0.0458***	0.0025	-0.0012	0.0707	0.0281	0.0386**
	(1.00)	(0.40)	(2.72)	(0.08)	(-0.05)	(1.35)	(1.26)	(2.24)
EM_{t-1} x $Treat_i$ x $Delist_t$	0.0543	0.2958*	-0.0015	0.0855**	0.0294	0.2931*	-0.0099	0.0948**
	(1.15)	(1.67)	(-0.08)	(1.99)	(1.65)	(1.87)	(-0.44)	(2.19)
EM_{t-1} x $Treat_i$	-0.0588**	0.0563	-0.0247*	0.0542	0.0113	-0.0522	0.0130	-0.0134
	(-2.52)	(0.41)	(-1.88)	(1.43)	(0.00)	(-0.63)	(0.72)	(-0.50)
$TURN_{t-1}$	0.0182	-0.2069	0.0250	-0.0986	-0.1470	-0.1188	-0.1079*	0.0092
	(0.09)	(-1.06)	(0.25)	(-0.79)	(-0.70)	(-0.46)	(-1.88)	(0.09)
$SIZE_{t-1}$	0.0698***	0.0684***	0.0269***	0.0259***	0.0658***	0.0613***	0.0241***	0.0238***
	(8.11)	(3.84)	(5.12)	(3.15)	(6.32)	(7.34)	(3.93)	(6.50)
$STDEV_{t-1}$	-0.1152	1.7697	0.0603	0.7650	0.2777	0.2784	-0.0205	0.3579
	(-0.14)	(1.04)	(0.23)	(1.37)	(0.32)	(0.26)	(-0.06)	(1.06)
$RETURN_{t-1}$	4.2627	4.0633	-1.6106	0.5032	0.2398	7.1007***	-3.7183	1.9856
	(1.07)	(0.67)	(-0.98)	(0.15)	(0.04)	(7.07)	(-1.25)	(1.41)
ROA_{t-1}	0.1501***	0.5678**	0.0313	0.0209	0.1651**	0.4432**	0.0115	0.0910
	(3.86)	(2.22)	(1.38)	(0.29)	(2.47)	(2.61)	(0.37)	(1.62)
$LEVERAGE_{t-1}$	0.0017	0.0743	-0.0003	0.0384	0.0614	-0.0246	0.0262	-0.0005
	(0.01)	(0.43)	(-0.01)	(0.61)	(0.61)	(-0.35)	(0.73)	(-0.01)
$ALPHA_{t-1}$	1.8765	-0.0778	3.1500***	1.7721	3.5806	1.1565	4.5986**	1.5217
	(0.62)	(-0.12)	(2.77)	(1.17)	(1.24)	(1.13)	(2.38)	(1.65)
MB_{t-1}	-0.0027	-0.0220***	0.0006	-0.0049*	-0.0045	-0.0046	0.0003	0.0017
	(-0.72)	(-2.78)	(0.28)	(-1.94)	(-1.28)	(-0.67)	(0.17)	(0.63)
$DISACCR_{t-1}$	0.0708	-0.3955	0.1131	-0.1394	-0.0523	0.0399	0.0498	0.0556
	(0.36)	(-1.53)	(1.49)	(-1.44)	(-0.42)	(0.12)	(1.10)	(0.45)
$NSKEWN_{t-1}$	0.0255	0.0285			-0.0106	0.0894***		
	(1.13)	(0.59)			(-0.48)	(2.99)		
$DUVOL_{t-1}$			0.0108	0.0567			-0.0055	0.0758***
			(0.42)	(1.37)			(-0.18)	(2.65)
Constant	-1.9850***	-1.6102	0.2563***	0.4823***	-1.4592***	-0.7538***	0.2919***	0.7509
	(-13.73)	(0.00)	(4.98)	(3.36)	(-5.74)	(8.41)	(3.58)	(0.00)
($\beta_4 High = \beta_4 Low$) (p-value)	(0.099)		(0.073)		(0.094)		(0.032)	
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,954	1,817	3,954	1,817	3,991	3,058	3,991	3,058
R-squared	0.075	0.082	0.077	0.094	0.059	0.102	0.067	0.086

TABLE 7: Earnings Management, Crash Risk and Information Environment

Table 7 reports regression estimates of equation (5). The dependent variable is one of the two alternate crash risk measures: i) *NSKEWN* is the negative one multiplied by the skewness of the firm-specific weekly returns in a given year; ii) *DUVOL* - “down-to-up” volatility – is the standard deviation of below the mean weekly firm-specific returns divided by the standard deviation of above the mean weekly firm-specific returns in a given year. *EM* is an indicator variable that equals one for firms above median of discretionary accruals in their country, and zero otherwise. *Delist* is an indicator variable that equals one starting in year *t+1* after the cross-delisting event in year *t*, and zero otherwise. *INF* is an indicator variable that is equal to one for firms above the median in their countries for each measure of information asymmetry - bid-ask spread and changes in R&D - and zero otherwise. We use two information asymmetry proxies: 1) the *Bid-Ask spread is* measured as the yearly median of the daily difference between ask and bid prices, scaled by the midpoint; 2) and annual changes in R&D. The set of control variables includes: *TURN* is the yearly change in the average monthly share turnover in the previous year *(t-1)*; *SIZE* is the logarithm of the market value of equity in year *t-1*; *STDEV* is the standard deviation of weekly firm-specific returns in year *t-1*; *RETURN* is the logarithm of one plus the residual estimated from equation (1) in year *t-1*; *ROA* is the net income before extraordinary items scaled by total assets in year *t-1*; *LEVERAGE* is the total debt scaled by total assets in year *t-1*; *ALPHA* is the natural logarithm of one plus the intercept (alpha) estimated from equation (1) in year *t-1*. *MB* is the market value of equity divided by the book value of equity in year *t-1*; *DISACCR* is the absolute value of discretionary accruals, estimated using the modified Jones’ (1991) Model (Dechow, Sloan and Sweeney, 1995). All variables are defined in Appendix A. Country, industry and year fixed effects are included in all regressions. Robust *t*-statistics with standard errors clustered at both country- and year-level are shown in parentheses. The last two rows show the sum and the respectively *p*-value of the coefficients $[EM + EM \times Delist \times INF + EM \times Delist + EM \times INF]$. ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively.

Dependent variable:	*NSKEWN*		*DUVOL*	
Information Environment Proxy:	bid-ask spread	R&D	bid-ask spread	R&D
	(1)	(2)	(3)	(4)
EM_{t-1}	0.0290	-0.0025	0.0171	0.0089
	(0.72)	(-0.06)	(0.87)	(0.63)
$Delist_t$	-0.0746	-0.1191**	-0.0711***	-0.0772***
	(-1.25)	(-2.03)	(-2.80)	(-2.85)
INF_t	0.1369*	0.0642	0.0590**	0.0064
	(1.80)	(1.50)	(2.03)	(0.34)
EM_{t-1} x $Delist_t$ x INF_t	0.3527***	0.1387**	0.0874**	0.0707*
	(14.47)	(2.16)	(2.02)	(1.69)
EM_{t-1} x $Delist_t$	-0.0327*	0.0488	-0.0117	-0.0052
	(-1.86)	(0.97)	(-0.62)	(-0.18)
EM_{t-1} x INF_t	-0.1664*	-0.0781**	-0.0489	-0.0274
	(-1.86)	(-2.23)	(-1.31)	(-1.09)
$Delist_t$ x INF_t	-0.2242	-0.1105	-0.0569	-0.0435
	(-1.61)	(-1.59)	(-0.92)	(-1.60)
$TURN_{t-1}$	-0.0086	-0.0249	0.0012	-0.0042
	(-0.04)	(-0.13)	(0.02)	(-0.06)
$SIZE_{t-1}$	0.0725***	0.0731***	0.0235***	0.0238***
	(6.72)	(7.21)	(4.34)	(4.64)
$STDEV_{t-1}$	0.3427	0.3382	0.2070	0.2089
	(0.30)	(0.29)	(0.58)	(0.59)
$RETURN_{t-1}$	0.5534	0.3433	-1.1832	-1.1838
	(0.15)	(0.09)	(-0.58)	(-0.59)
ROA_{t-1}	0.1788*	0.1803*	0.0088	0.0077
	(1.95)	(1.88)	(0.33)	(0.28)
$LEVERAGE_{t-1}$	0.0448	0.0510	0.0481	0.0515
	(0.44)	(0.47)	(1.49)	(1.55)
$ALPHA_{t-1}$	5.0275**	5.1326**	4.3416***	4.3048***
	(2.27)	(2.27)	(3.45)	(3.43)
MB_{t-1}	-0.0055	-0.0058	0.0002	0.0001
	(-1.16)	(-1.22)	(0.09)	(0.02)
$DISACCR_{t-1}$	0.0099	0.0185	-0.0178	-0.0106
	(0.07)	(0.13)	(-0.37)	(-0.21)
$NSKEWN_{t-1}$	0.0216	0.0213		
	(0.75)	(0.75)		
$DUVOL_{t-1}$			0.0578**	0.0587**
			(2.21)	(2.22)
Constant	-1.8107***	-1.8521***	0.5541***	0.5510***
	(-14.60)	(-13.88)	(4.14)	(4.26)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	3,280	3,280	3,280	3,280
R-squared	0.080	0.078	0.091	0.089
$[EM + EM \times Delist \times INF + EM \times Delist + EM \times INF]$	0.1826**	0.1069**	0.0439	0.0470**
p-value	(0.012)	(0.047)	(0.137)	(0.014)

TABLE 8: Cross-sectional regressions

Table 8 provides regression estimates for cross-sectional estimates using different specifications. Cumulative abnormal returns (CAR) are estimated for a three-day window (-1, +1) and eleven-day window (-5, +5). *Delist* is an indicator variable equal to one if a treatment firm is delisted in year *t*, and zero otherwise. *Origin of the law* is an indicator of institutional quality (e.g., La Porta, Lopez-De-Silanes and Shleifer (2008)), which assigns firms in high (low) group depending if they are from Common (Civil) Law countries. *GDP per Capita* is the logarithm of GDP per capita. *Disclosure* is the disclosure requirements index proposed by La Porta, Lopez-De-Silanes and Shleifer (2006). Actual earnings, analyst earnings forecast and the number of analysts that follows each firm are from Institutional Brokers Estimate System (I/B/E/S). Absolute earnings surprise measured as the difference between actual earnings and median analyst forecast. Dispersion is measured as the standard deviation of analyst' forecasts. *Positive Earnings* is the Earnings Surprise multiplied by a dummy variable if the actual earnings exceed the mean analyst forecast, and zero otherwise (Bailey, Karolyi and Salva (2006)). All specifications are heteroskedasticity-consistent. Robust t-statistics reported under each estimated coefficient in parentheses. ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively.

Dependent variable:	CAR (-1.+ 1)	CAR (-5,+ 5)	CAR (-1.+ 1)	CAR (-5,+ 5)	CAR (-1.+ 1)	CAR (-5,+ 5)	CAR (-1.+ 1)	CAR (-5,+ 5)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Origin of Law	0.0144***	0.0009	0.0014	0.0181***	0.0166***	0.0058*		
	(4.04)	(0.24)	(0.44)	(5.63)	(5.04)	(1.65)		
DISCLOSURE	0.1500***	0.2192***			0.1332***	0.1823***		
	(6.80)	(9.61)			(6.38)	(8.23)		
GDD per Capita	-0.0085**	-0.0187***	-0.0040	-0.0121***				
	(-2.31)	(-6.78)	(-1.09)	(-4.38)				
Delist	0.9703***	0.2189	1.0088***	0.2894*	0.3143***	0.2157***	0.0249	0.3419
	(7.39)	(1.29)	(8.24)	(1.85)	(7.22)	(4.08)	(0.16)	(1.54)
Delist x DISCLOSURE	-0.3700***	-0.5807***			-0.5071***	-0.5808***		
	(-5.36)	(-6.82)			(-8.27)	(-7.95)		
Delist x ORIGIN	-0.0111	0.0258**	0.0222***	0.0783***	0.0280***	0.0172		
	(-1.22)	(2.05)	(2.99)	(7.96)	(3.42)	(1.45)		
Delist x GDP per Capita	-0.0718***	-0.0008	-0.0990***	-0.0444***				
	(-5.16)	(-0.04)	(-8.64)	(-3.05)				
EARNINGS SURPRISE							-0.0082	-0.0385*
							(-0.18)	(-1.85)
DISPERSION							0.0109	-0.0082
							(0.22)	(-0.16)
ANALYSTS							0.0004	-0.0041
							(0.09)	(-1.11)
POSITIVE EARNINGS							-0.1223	-0.0913
							(-0.73)	(-1.22)
Delist x SURPRISE							0.0259	0.0147
							(0.57)	(0.07)
Delist x ANALYTS							-0.0040	-0.0042
							(-0.83)	(-0.73)
Delist x DISPERSION							0.0250	-0.0709
							(0.50)	(-0.86)
Delist x POSITIVE EARN.							0.2215	0.1405
							(1.32)	(0.62)
Constant	-0.0090	0.0769**	0.0444	0.1555***	-0.0883***	-0.0980***	-0.0875	0.0072
	(-0.23)	(2.46)	(1.10)	(5.02)	(-5.88)	(-6.19)	(-0.57)	(0.10)
R-squared	0.037	0.015	0.024	0.009	0.025	0.013	0.170	0.227