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Equity Offerings, Stock Price Crash Risk, and the Impact of Securities Regulation: International Evidence

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Abstract

We examine whether earnings manipulation around seasoned equity offerings (SEOs) is associated with an increase in the likelihood of a stock price crash post-issue and test whether the enactment of securities regulations attenuate the relation between SEOs and crash risk. Empirical evidence documents that managerial tendency to conceal bad news increases the likelihood of a stock price crash (Jin and Myers, 2006; Hutton, Marcus, and Tehranian, 2009). We test this hypothesis using a sample of firms from 29 EU countries that enacted the Market Abuse Directive (MAD). Consistent with our hypothesis, we find that equity issuers that engage in earnings management experience a significant increase in crash risk post-SEO relative to control groups of non-issuers; this effect is stronger for equity issuers with poor information environments. In addition, our findings show a significant decline in crash risk post-issue after the enactment of MAD that is stronger for firms that actively manage earnings. This decline in post-issue crash risk is more effective in countries with high ex-ante institutional quality and enforcement. These results suggest that the implementation of MAD helps to mitigate managers' ability to manipulate earnings around SEOs.

I. Introduction

Empirical evidence supports the theory that managerial tendency to conceal bad news increases the likelihood of stock price crashes (Jin and Myers, 2006; Hutton, Marcus, and Tehranian, 2009). The incidence of such crashes, or large negative returns, is positively associated with firm- and country-level opacity, and there is some evidence that regulation may attenuate the relation between opacity and crash risk (Hutton et al., 2009). While a host of incentives including career concerns and compensation contracts may motivate managers to conceal or delay the disclosure of bad operating performance (Kothari, Shu, and Wysocki, 2009), the incentive to conceal bad news, specifically through earnings manipulation, is particularly strong when a firm raises external capital. As argued by Dechow, Sloan, and Sweeney (1996), the desire to lower the cost of external financing (e.g., through a seasoned equity offering) is an important motivation for earnings manipulation.

This paper builds on the above literature and examines the relation between earnings manipulation around seasoned equity offerings (SEO) and future stock price crash risk using a broad sample of firms from 29 European Union countries. Our study of crash risk is motivated by recent literature that documents the impact of extreme outcomes in stock returns on investor welfare (e.g. Yan (2011)). The determinants of crash risk have received increased attention since the recent global financial crisis; crash risk is important to investors because unlike risks with symmetric volatilities, it cannot be reduced through diversification (Sunder, 2010). While earnings manipulation around equity offerings and its effect on operating and stock price performance has been studied extensively (e.g. Teoh, Welch, and Wong (1998), Rangan (1998), Cohen and Zarowin (2010)), to the best of our knowledge, ours is the first study to examine the link between earnings management around equity issues and subsequent stock price crash risk.[1] We further examine how regulation aimed at improving transparency and curtailing market manipulation, namely, the enactment of the Market Abuse Directive (MAD), affects the relation between earnings management around equity issues and crash risk.

[1] A contemporaneous study by Boehme, Fotak, and May (2014) finds that US firms that issue seasoned equity experience an increase in the likelihood of a stock price crash. They do not examine the link between earnings management around the SEOs and subsequent crash risk.

Ross (1977) argues that a firm's decision to issue equity is based on private managerial information about future earnings prospects; this view suggests that managers issue equity when the stock price is overvalued and when they perceive lower future earnings prospects. Empirical evidence on this "timing hypothesis" has been mixed (see e.g. Eckbo, Masulis, and Norli (2007), Graham and Harvey (2001), Baker and Wurgler (2002), Teoh et al. (1998), Shivakumar (2000), Brous, Data, and Kini (2001)). Revealing negative information about future earnings prior to an SEO could significantly increase the cost of raising external capital, which may encourage managers to conceal such information through earnings manipulation (Dechow et al., 1996). Because managers' ability to withhold bad news is limited, when the accumulated negative information reaches a tipping point, such information is released at once, resulting in a stock price crash (Jin and Myers, 2006). This is more likely to occur subsequent to the issuance of equity, given the incentive to conceal such information prior to the SEO. Building on these arguments, we conjecture that firms that engage in aggressive manipulation strategies to inflate earnings around an SEO should experience an increase in the probability of stock price crashes. Further, we posit that the increase in crash risk post-SEO should be stronger for firms that find it easier to engage in such behavior; specifically, we conjecture that firms with poor information environments should exhibit a higher probability of crash risk subsequent to the SEO.

In addition to exploring the link between earnings management around SEOs and crash risk in an international setting, we further examine how the enactment of securities regulation affects firms' ability to manage earnings around SEOs and in turn, firms' crash risk post-SEO. Securities market regulators recognize the strong incentives to manipulate market price around securities issues and enact securities regulation to avoid practices of market abuse that specifically include more stringent disclosure requirements for securities issuers. Hutton et al. (2009) document that the relation between earnings management and stock price crash risk dissipates after the passage of the Sarbanes-Oxley Act. This suggests that the enactment of SOX decreased managers' ability to manage earnings. As this case shows, if securities regulations are adequately enforced, they should discourage earnings manipulation around SEOs, which should result in a decline in post-issue crash risk after the reforms are enacted. We examine this hypothesis by focusing on a piece of regulation enacted across the European Union: MAD. Empirical evidence (Christensen et al., 2014) supports the view that MAD has been effective (i.e. associated with positive capital market consequences), at least in countries with strong enforcement. We focus on this directive for a couple of reasons. First, this directive addresses issues that are closely related to the issuance of securities – market manipulation and insider trading. Second, the same directive is implemented across our full sample of EU countries, which allows us to examine how cross-country differences affect the implementation of the same reform. Finally, as documented in Christensen et al. (2014), MAD was implemented at different points in time across the EU, which helps our identification strategy, as opposed to studies of a single regulation or regulations implemented simultaneously. In unreported results, we also explore the impact of a subsequent directive, the Transparency Directive (TPD) and find similar, although weaker results. We focus on MAD because this is the first of these two important pieces of securities regulation to be implemented across our sample of countries.

We test our hypotheses by employing a difference-in-differences methodology using a sample of 6,735 firms from 29 EU countries that enacted the MAD Directive. Following prior studies (Chen, Hong, and Stein, 2001; Kim et al., 2011a, 2011b; DeFond, Hung, Li, and Li, 2015), we measure firm-specific crash risk using two proxies: 1) *NSKEW* - the negative skewness of firm-specific weekly returns over the fiscal year and 2) *DUVOL* - down-to-up volatility. DeFond et al. (2015) argue that these crash risk measures are able to capture the negative skewness in the volatility of the return pattern. Our main measure of earnings management is total discretionary accruals. We estimate total discretionary accruals using the modified Jones (1991) model (Dechow, Sloan, and Sweeney, 1995; Teoh et al., 1998).

We document several new findings. We find a significant increase in crash risk following SEOs for our sample of equity issuers relative to various control groups; this effect is stronger for firms that engage in earnings management around SEOs; equity issuers engaging in earnings management are less likely to have large positive jumps in stock price; this suggests that our findings are not the result of fat-tailed distributions, but instead, they are a result of increases in tail risk. The relation between earnings manipulation and post-issue crash risk is robust to controlling for well-known factors that have been shown to influence the occurrence of extreme negative returns (Chen, et al., 2001). We also find that the increase in crash risk post-SEO is concentrated in firms with a poor information environment, consistent with the view that managers in such firms find it easier to engage in earnings manipulation. We further document a significant decline in crash risk post-issue after the enactment of the MAD directive in the EU, especially for firms that actively engage in earnings manipulation. This finding is mainly driven by firms in countries with strong ex-ante institutional quality. Our evidence suggests that the enactment of this regulation helps to mitigate the information asymmetry problems associated with SEOs and to curtail the use of earnings management to inflate earnings around SEOs.

Our paper contributes to the literature in several ways. First, to the best of our knowledge, this is the first study to document the link between earnings management around seasoned equity issues and subsequent crash risk. We explore the link between SEOs and crash risk in an international setting, but more importantly, we document one important underlying mechanism for the increased crash risk post-issue - the extent of earnings management around SEOs. In addition, we document how the enactment of securities regulation attenuates earnings manipulation around SEOs and subsequent crash risk for firms in countries with strong ex-ante institutional quality.

Our study also contributes to the literature by exploring the link between firm-level opacity and crash risk (Hutton et al., 2009; Kim, Li, and Zhang, 2011a). Hutton et al. (2009) find that more opaque firms are more prone to crash risk, while Kim et al. (2011a) document that corporate tax avoidance is positively associated with crash risk. We expand on this literature by linking crash risk to another firm-initiated event, the issuance of equity, and we further contribute to the growing literature that links crash risk to country-level institutional quality and to changes in financial reporting (Jin and Myers, 2006; DeFond et al., 2015). We expand on the latter studies by providing evidence on how securities regulation, through its impact on disclosure and transparency, can affect stock price crash risk within the context of SEOs.

Our study also contributes to the literature on the impact of securities regulation (Christensen et al., 2014; La Porta, Lopez-de-Silanes, and Shleifer 2006; Zhang, 2007) by exploring how such regulations can affect the relation between SEOs and crash risk by reducing managers' ability and incentive to engage in earnings management (i.e. hiding bad news) around SEOs. Our evidence suggests that managers' ability to hide bad news around SEOs is curtailed by the enactment and implementation of MAD. Finally, we add to the literature on the effects of enforcement (e.g. Bhattacharya and Daouk (2002), Bushman, Piotroski, and Smith (2005), Jackson and Roe (2009)); our findings underscore the importance of ex-ante institutional quality and enforcement on the effects of securities regulation. Consistent with Djankov et al.'s (2003) enforcement theory and with the findings in Christensen et al. (2014), we document that the reduction in crash risk post-issue following the implementation of MAD is stronger in countries with better ex-ante institutional quality and enforcement.

The rest of the paper is organized as follows. In Section II we review the literature and develop our hypotheses. In Section III we describe the data and methodology used to test our hypotheses. In Section IV we present our main results on SEOs, earnings management, and crash risk. In Section V we present results for the impact of securities regulation. We discuss robustness tests in Section VI and conclude in Section VII.

II. Hypotheses Development

As argued by Ross (1977) a firm's decision to issue equity is based on private managerial information about future earnings prospects; managers prefer to issue equity when they have private information about a decline in future earnings (Ross, 1977). In addition, empirical evidence suggests that managers tend to withhold bad news relative to good news (Kothari, et al., 2009), and this tendency to conceal bad news has been linked to an increase in the likelihood of stock price crashes (Jin and Myers, 2006; Hutton et al., 2009). The incentive for managers to engage in such behavior is likely exacerbated when managers are considering issuing equity (Dechow et al., 1996). Consistent with this view, several studies show that managers engage in earnings management in an attempt to inflate reported earnings around an SEO (Teoh et al., 1998; Rangan, 1998). If managers deliberately withhold bad news prior to the issuance of equity, the likelihood of observing a subsequent stock price crash should increase post-issue. Jin and Myers (2006) argue that the amount of bad information that can be withheld by insiders is limited; thus, there comes a point in which all bad news come out simultaneously leading to a crash in the stock price. In line with this view, using data on US stocks, Boehme et al. (2014) document an increase in the likelihood of a stock price crash subsequent to an SEO.

The likelihood of a stock price crash post-issue should be higher for firms that find it easier to withhold bad news from the market. As Jin and Myers (2006) document, insiders in more opaque firms should find it easier to withhold bad news and should experience higher crash risk; empirical evidence supports the positive association between firm opacity and crash risk (Hutton et al., 2009; Kim et al., 2011a). Firms with poor information environments should also find it easier to hide bad news (DeFond et al., 2015; Hutton et al., 2009). A way in which managers can withhold bad news from the market is through the manipulation of earnings. Specifically, as has been documented in the literature (Teoh et al., 1998; Rangan, 1998, Cohen and Zarowin, 2010), managers can engage in earnings manipulation prior to an SEO in attempts to inflate reported earnings. Such behavior is likely to result in an increased likelihood of subsequent stock price crashes as bad news is subsequently revealed to the market. Building on these ideas, we formulate our first hypotheses:

H1a: Firms will experience an increase in crash risk subsequent to an SEO and this increase should be greater for firms that engage in earnings management around the SEO

H1b: The increase in crash risk should be stronger for firms with poor information environments that engage in earnings management around the SEO

Christensen et al. (2014) document positive capital market consequences associated with two EU directives addressing securities regulations: MAD and TPD. The positive capital market effects associated with these regulations suggest that they have been effective in improving disclosure and reporting quality and addressing concerns about market manipulation. We focus on the first of these two directives - MAD - that addresses insider trading and market manipulation.[2] The enactment of MAD should mitigate manager insiders' ability to withhold bad information and to manipulate earnings, especially around the time of an SEO. If this is the case, the likelihood of stock price crashes subsequent to SEOs should be lower. We thus formulate our final hypothesis:

H2: Crash risk subsequent to an SEO should be lower after the enactment of the Market Abuse Directive (MAD)

The impact of securities regulation is likely to vary across firms and its effectiveness will depend on the quality of its enforcement (Jackson and Roe, 2009). Djankov et al. (2003) argue that the impact of regulations can vary widely across countries, and such reforms could be more beneficial in countries with already established mechanisms to enforce the new regulations (the enforcement theory). Consistent with this view, Christensen et al. (2014) show that the capital market effects associated with the enactment of MAD are stronger in countries with better ex-ante institutional quality and enforcement. On the other hand, all else equal, firms in weaker

[2] As mentioned earlier, the unreported results are similar (but slightly less robust) when examining TPD.

countries (i.e. poor rule of law) may benefit more from regulations aimed to improve the information environment by improving disclosure and accountability of corporate financial reporting. Given these opposing views, although we do not formally develop a hypothesis, we also report results on how the impact of MAD is affected by firm-level as well as country characteristics.

III. Data & Methodology

We test our hypotheses using a broad sample of firms from 29 EU countries that adopted the Market Abuse Directive (MAD) during the period 1999 through 2012. Our sample period starts in 1999 because data is unavailable for many Eastern European countries in our sample prior to 1999; starting in 1999 also ensures that our sample period is fairly equally distributed between the pre- and post-period relative to the enactment of MAD. We obtain dates in which MAD came into force from Christensen et al. (2014). Our initial sample consists of all firms from these countries that are covered in Thomson Financial's WorldScope database. We collect financial statement data from WorldScope and stock price data from DataStream to construct our main variables and controls. Following standard procedure in the literature, we exclude firms from regulated industries (financials and utilities, SIC codes between 6000 and 6999 and between 4900 and 4949) and those with missing data on total assets or negative sales, and we drop firms with total assets lower than $10 million to make firms more comparable across countries. To mitigate the influence of outliers we winsorize all variables at the top and bottom 1% of the distribution. This screening process leads to a final sample of 6,735 firms from 29 countries, totaling 41,215 firm-year observations.

We proceed to collect information on new equity issues from Thomson Financial's Securities Data Corporation (SDC). From SDC we collect information on the date of the issues, the proceeds raised from each issue and the market(s) in which the security was issued. In constructing our sample of SEOs we follow Corwin (2003) and exclude initial public offerings, unit offers, rights, mutual conversions, and equity offerings by closed-end investment funds, real estate investment trusts (REITs), unit investment trusts, beneficial interests, and utilities. In our analyses, we aggregate the proceeds raised in the domestic market for each firm-year (firm-quarter-year in robustness tests).

Table 1 shows a description of our sample firms by country and the respective dates of the MAD enactment in each country. Seasoned equity issuers (1,352) represent about 20% of our sample. Most of our countries adopted MAD in 2005. The distribution of firms varies widely across countries. The U.K. has the largest number of firms (2,005) followed by France (898) and Germany (808), while Latvia (9) and Malta (11) have the fewest number of firms.[3] Six countries in our sample do not have equity issuers meeting our criteria.[4] We include firms in these countries in our main regressions because such firms can serve as controls, given that those countries enacted MAD. Our results are robust to the exclusion of firms from these six countries.

[Insert Table 1]

To estimate crash risk, we first estimate firm-specific weekly returns using the local market index and a global market index. To account for nonsynchronous trading, we include the lead and lag local (world) stock market returns in each regression (Hutton, et al., 2009; Dimson, 1979) and estimate the following model using weekly returns for each firm-year:

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

where $R_{i,t}$ is firm *i*'s stock return in week *t*; $R_{m,t}$ is the local 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. We use weekly returns in our estimations to mitigate measurement problems associated with infrequent trading and to avoid the issue with misleading return distributions associated with daily returns (see e.g. DeFond et al. (2015)). Consistent with the literature, we use the natural logarithm of one plus the firm-specific return ($\varepsilon_{i,t}$) as our measure of firm-specific returns, *FIRMRET*.

We use two measures of crash risk, following Chen et al. (2001) and Kim et al. (2011a, 2011b): 1) *NSKEW* –negative skewness– the negative of the third moment of firm-specific weekly returns over the fiscal year, and 2) *DUVOL* –down-to-up volatility– the standard deviation of the below-the mean weekly firms-specific returns divided by the standard deviation

[3] Our results hold if we exclude these countries (i.e., Latvia, Malta, Estonia and Iceland) with very few firms (less than 15) from our analysis.

[4] The six countries that do not report any equity issuers during our sample period are Cyprus, Estonia, Latvia, Malta, Slovak Republic, and Slovenia. Firms from these countries represent only about 2.5% of our sample.

of above-the mean firm-specific return in a given year. Larger values of both measures indicate greater crash risk.[5]

Our main measure of earnings management is total discretionary accruals.[6] We estimate total discretionary accruals using the modified Jones (1991) model, following Dechow et al. (1995) and Teoh et al. (1998). To estimate total discretionary accruals, we first estimate the following regression in each subgroup of firms, *j*, that includes all firms in the same country and same two-digit SIC code as the equity issuer:

$$\frac{\mathrm{TOTACC}_{i,t}}{\mathrm{TA}_{i,t-1}} = \alpha_j \frac{1}{TA_{i,t-1}} + \beta_{1j}\frac{\Delta\mathrm{SALES}_{i,t}}{TA_{i,t-1}} + \beta_{2j}\frac{\mathrm{PPE}_{i,t}}{TA_{i,t-1}} + \varepsilon_{i,t} \qquad (2)$$

TOTACC is total accruals (earnings before extraordinary items less cash flows from operations); *TA* is total assets, Δ*SALES* is the change in sales in year t, and *PPE* is property, plant, and equipment. Nondiscretionary total accruals (*NDTAC*) are obtained using the estimates from the above regressions as:

$$\mathrm{NDTAC}_{i,t} = \hat{\alpha}_j \frac{1}{TA_{i,t-1}} + \hat{\beta}_{1j}\frac{\Delta\mathrm{SALES}_{i,t}}{TA_{i,t-1}} + \hat{\beta}_{2j}\frac{\mathrm{PPE}_{i,t}}{TA_{i,t-1}} \qquad (3)$$

We compute total discretionary accruals (*DISCACC*) as the difference between total accruals and nondiscretionary accruals. Appendix A has detailed definition of our estimation of discretionary accruals.

Table 2 shows descriptive statistics for all firm-level variables used in our analyses. Panel A of Table 2 shows that the average proceeds raised in an SEO represents 1% of total assets. The average crash risk *NSKEW* (*DUVOL*) is -0.239 (-0.123). In Panels B and C we report statistics for our sample of equity issuers and non-issuers; each year we classify firms as issuers if they raise equity in the prior year. Firms that issue equity have significantly higher crash risk in the subsequent year; average *NSKEW* (*DUVOL*) is -0.187 (-0.099) for equity issuers, compared to -0.241 (-0.124) for non-issuers (these results are significant at the 1% level). We observe that equity issuers tend to be larger, less profitable (in terms of ROA), more

[5] As an alternate measure of crash risk, we use an indicator variable, *CRASH*, that is equal to one if the firm-specific return, *FIRMRET*, is 3.2 or more standard deviations below firm *i*'s mean weekly firm-specific log-return during that year, and 0 otherwise. In unreported results, we find similar results when this alternate measure is used. We do not use the indicator of crash risk in our main results because this measure does not capture the asymmetry in the return distribution; the left and right tail risk are computed independently (see e.g. DeFond et al. (2015)).

[6] In robustness tests, we use discretionary current accruals as our proxy for earnings management, following Teoh et al. (1998). Appendix A has a detailed explanation of the estimation of current discretionary accruals.

leveraged, but with higher market-to-book ratios than non-issuers. In addition, equity issuers have significantly higher levels of discretionary accruals.

In Table 3 we report Pearson correlation coefficients across our main variables. We observe that both measures of crash risk are positively correlated with equity issuance in the prior year. Consistent with other studies (e.g. DeFond et al. (2015)) we find that crash risk is also positively correlated with firm size, firm-specific returns, profitability, leverage, and market-to-book. We also observe a positive correlation between equity issues and firm size, leverage, discretionary accruals, and market-to-book ratios, but a negative correlation between equity issues and profitability.

IV. Main Results

a. SEOs and Crash Risk

We first examine whether firms that issue seasoned equity experience a subsequent increase in crash risk, and whether the change in crash risk is associated with earnings management around the SEO. To test the predictions of our first two hypotheses, we run various specifications of the following regressions:

$$Crash\ Risk_{i,c,t} = \alpha + \beta_1 SEO_{i,t-1} + \beta_2 SEO_{i,t-1} \times HIEM + \beta_3 HIEM + \beta_4 X_{i,t-1} + \beta_5 Z_{c,t-1} + \varepsilon_{i,t} \quad (4)$$

where *Crash Risk*$_{i,c,t}$ refers to our two measures- *NSKEW* and *DUVOL*- for firm *i* in country *c* in year *t*; *SEO*$_{i,t-1}$ is an indicator variable that equals one if a firm raised equity capital in the home country *c* in year *t-1* and zero otherwise;[7] *HIEM* refers to two indicator variables for firms with high levels of earnings management: *High EM (Total)* and *High EM (Current)*. *High EM Total (Current)* is an indicator variable that equals one for firms with above median total (current) discretionary accruals in their country in year *t-2* (the year before the equity issue) and zero otherwise. X$_{i,t-1}$ is a vector of controls that have been shown to affect crash risk (Chen et al. 2001; DeFond et al., 2015, Hutton et al., 2009). These include :1) *DTURN*$_{t-1}$ – the change in the average monthly share turnover between year *t-1* and *t-2*, which captures differences of opinion among investors, which can impact crash risk; 2) *SIZE*$_{t-1}$ – the log of the book value of total assets, given that larger firms tend to have higher crash risk; 3) *SIGMA*$_{t-1}$ – the standard deviation of weekly firm-specific return in year *t-1*, to control for the impact of higher volatility on crash

[7] In robustness tests, we also use the total SEO proceeds (in US$ million) raised in the home market in year *t-1*, scaled by total assets in year *t-2* and find qualitatively similar results.

risk; 4) $FIRMRET_{t-1}$ – the average weekly firm-specific return in year *t-1*, to control for the higher likelihood of a crash for firms with higher past returns; 5) ROA_{t-1}- earnings before extraordinary items divided by total assets, to control for the impact of operating performance on crash risk; 6) $Leverage_{t-1}$ – long-term debt-divided by total assets; 7) *DISCACC* – the absolute value of discretionary accruals estimated using the modified Jones (1991) model, as in Dechow et al. (1995), to control for the increased crash risk for firms with higher levels of discretionary accruals; 8) $Market\text{-}to\text{-}Book_{t-1}$ – the market value of equity divided by the book value of equity, to control for growth opportunities, and 9) lagged *NSKEW* (*DUVOL*) to control for the propensity of firms with higher crash risk to exhibit higher future crash risk. $Z_{c,t-1}$ is a vector of country level controls, which includes the log of Gross Domestic Product (GDP) per capita (*Log GDP per capita*) and the growth in real GDP (*GDP growth*) to control for financial development and growth, and *Governance index*, which is the average of the six governance indicators of Kaufmann, Kraay, and Mastruzzi (2009).[8] All of the variables used in our analyses are described in Appendix A. We include country, industry, and year fixed effects in all regressions to capture time-invariant country and industry characteristics that may affect crash risk, and to control for time effects, respectively, and we cluster standard errors at the country level allowing for the error term to be correlated for firms within a country.

We report results from estimations of Equation 4 in Table 4. To test Hypothesis 1a, we first run regressions excluding the indicator variable, *HIEM*, and the interaction term. We present results from these regressions in Panel A of Table 4. Our variable of interest is the coefficient β_1, which captures the change in crash risk for firms that issued equity in the prior year relative to firms in the same country that did not issue equity. Per the first part of Hypothesis 1a, we expect this coefficient to be positive and significant if the issuance of seasoned equity is associated with increased crash risk. In Models (1) through (3) we present results using our primary measure of crash risk, *NSKEW*, while Models (4) through (6) show results for our alternate measure, *DUVOL*. In Model (1) we show results from our baseline specifications using country, industry, and year fixed effects. We observe a positive and significant coefficient on β_1, suggesting an increase in crash risk for firms that issue equity. The results are both statistically and economically significant. The coefficient in Model (1) suggests

[8] The six indicators include: voice and accountability, regulatory quality, political stability, government effectiveness, rule of law, and control of corruption.

that firms that issue equity in the prior year have a 0.052 increase in crash risk in the subsequent year, relative to firms that did not issue equity, which represents about 5.9% of the standard deviation (0.879). In Model (2) we report results using firm and year fixed effects to better control for time invariant firm-specific characteristics; results are similar when this alternate approach is used; we thus present the remaining results using our baseline specification with country, industry, and year fixed effects.

Differences in firm characteristics between equity issuers and non-issuers may help explain why we observe higher crash risk post-SEO. The descriptive statistics in Table 2 show, for example, that equity issuers tend to be much larger and less profitable than non-issuers. Although we control for size and profitability in our regressions, as another way to test the robustness of our results, in Model (3) we replicate our results using only a matched sample of non-equity issuers. Specifically, we run regressions using a control group of non-equity issuers that are matched by propensity score (PSM). We implement this procedure by first estimating a logit regression to model the probability of being an equity issuer, using all controls used in the second-stage regressions. Next, we estimate the propensity score for each firm using the predicted probabilities from the logit model and match each issuer to a non-issuer in its country and industry (two-digit SIC code) using the nearest neighbor matching technique (with replacement). The results in Model (3) confirm our earlier findings. The coefficient on β_1 remains positive and statistically significant. The magnitude of the results using the matched sample is similar to our earlier results. The results in Model (3) suggest that crash risk is 0.042 higher for firms that issue equity in the prior year, which represents 4.7% of its standard deviation.[9]

The results in Models (4) through (6) of Panel A of Table 4 use the alternate measure of crash risk, *DUVOL*, and confirm our baseline results. Firms that issue equity have significantly higher crash risk relative to those firms that do not issue equity. The magnitude and significance of the results using *DUVOL* are similar to those using *NSKEW*. For example, the coefficient in Model (4) indicates a 0.023 increase in *DUVOL* for firms issuing equity in the prior year, which corresponds to 5.9% of the standard deviation (0.389).

[9] For the subsample of PSM-matched firms, the standard deviation of *NSKEW* is 0.902.

To examine the mechanism driving the increase crash risk post-issue (the second part of Hypothesis 1a), we next explore whether the increase in crash risk subsequent to an SEO is associated with the extent of earnings manipulation around the SEO. To explore this, we estimate Equation 4 including the interactions with the proxies for high earnings management, *High EM (Total)* and *High EM (Current)*, based on the level of total and current discretionary accruals in the year prior to the SEO, respectively. While we expect that higher levels of discretionary accruals in the year prior to an SEO should be associated with higher crash risk, managers tend to have more discretion over current accruals (Guenther, 1994), which suggests that our findings should be more pronounced when using current discretionary accruals.

We report results from the estimation of Equation 4 in Panel B of Table 4. Our variable of interest is the interaction term, *High EM* x SEO_{t-1}, and the corresponding coefficient β_2. Hypothesis 1a predicts a positive and significant coefficient β_2, which would suggest that issuers of seasoned equity with high levels of discretionary accruals in the year prior to the SEO experience a larger increase in crash risk in the subsequent year. The results add support to Hypothesis 1a. The coefficient β_2 is positive and statistically significant across all model specifications. Taking the coefficients in Model (1) as an example, the results show that equity issuers with below-median discretionary accruals in their country in the year prior to the SEO experience a 0.044 increase in crash risk in the following year. Equity issuers with above median discretionary accruals experience a larger 0.062 increase in crash risk that corresponds to 7.1% of the standard deviation.[10] The magnitude of our results is larger when we use current discretionary accruals (Model (2)). The results in Model (2) suggest no difference in crash risk between non-issuers and equity issuers with below-median discretionary accruals prior to the SEO (coefficient on SEO is 0.013 with a t-statistic of 0.88), but a 0.082 higher crash risk (9.3% of its standard deviation) for equity issuers with high levels of current discretionary accruals. We obtain similar results when using our alternate measure of crash risk, *DUVOL*. From Model (3), the results show a 0.029 higher crash risk (7.5% of its standard deviation) post-issue for equity issuers with high levels of discretionary accruals relative to non-issuers.

The evidence thus far suggests that managers manipulate earnings through discretionary accruals prior to an SEO when they have private knowledge of a decline in future earnings,

[10] The sum of the coefficients on *SEO* and *SEO* x *HIEM* is 0.062 (0.018 + 0.044), and is statistically significant at the 1% level (p-value of the F-test for the significance of the sum is 0.000).

consistent with the predictions of Ross (1977). When the bad news about the lower earnings is revealed subsequent to the SEO, the market reacts adversely and a stock price crash ensues.

b. Impact of the Information Environment

A firm's information environment should affect managers' ability to manipulate earnings. Managers in more opaque firms may find it easier to hide or delay the reporting of bad news, which can result in higher subsequent crash risk for such firms (Jin and Myers, 2006). Per Hypothesis 1b, we expect that the increase in crash risk following an SEO should be more pronounced for firms with poor information environments that engage in earnings management. To test this hypothesis, we use various proxies of information asymmetry to classify firms. First, following the literature (Armstrong et al., 2010; DeFond et al., 2015), we construct an index of information quality that is based on variables that are associated with lower information asymmetry and better information quality (see e.g. Brennan and Subrahmanyam (1995), Derrien and Kecskés (2013), Armstrong et al. (2010), DeFond et al. (2015)). Specifically, our measure, *INFORMATION*, is the first principal component derived from the following variables: 1) *Analyst coverage* – the number of analysts covering a firm; 2) *ADR* – an indicator variable that is equal to one if a firm is cross-listed in a US exchange and 0 otherwise; 3) *Exchanges* – the number of exchanges in which a firm is listed; 4) *Index Constituent* – an indicator variable that equals one if a firm is included in any stock market index and zero otherwise; 5) *Foreign sales* – the two-year average of foreign-sales to total sales, and 6) *Size* – the log of the market value of equity. We multiply the factor scores by -1 such that our measure, *INFORMATION*, is decreasing in information quality.

Our second proxy for information asymmetry is the dispersion in analysts' earnings forecasts (*DISPERSION*) - the standard deviation of current fiscal year earnings forecasts scaled by the absolute value of the actual earnings per share. Dispersion in analysts' earnings forecasts is a well-known measure of uncertainty or disagreement among market participants (see e.g. Diether, Malloy, Scherbina (2002), Zhang (2006)). Higher dispersion in analysts' forecasts is a signal of divergent views about firms' future prospects; managers in such firms may find it easier to hide bad news. Finally, we use a measure based on the proportion of intangible assets- (*INTANGIBLES*) – intangible assets-to-assets, given that intangible assets are positively correlated with information asymmetry (e.g. Barth and Kaznik (1999), Barth, Kaznik, and McNichols (2001)).

Using these three proxies for information asymmetry, we create indicator variables that capture earnings management and the quality of a firm's information environment. Specifically, we create an indicator variable, *Poor Environment*, that is equal to one for firms with high earnings management (as defined earlier) and above median information asymmetry (based on the three measures – *INFORMATION*, *DISPERSION*, and *INTANGIBLE*S). We use these indicator variables and run Equation 4 with the interactions. The results are reported in Panel C of Table 4.

The results in Panel C of Table 4 show that firms with poor information environments that engage in earnings management around SEOs tend to have significantly higher subsequent crash risk, adding support to Hypothesis 1b. The interaction term *Poor Environment* x *SEO* is positive and significant across all model specifications. Taking the coefficients in Model (1) as an example, the results show no difference in crash risk between non-issuers and equity issuers with strong information environment (the coefficient on SEO_{t-1} is 0.026, but statistically insignificant). In contrast, equity issuers with poor information environment have crash risk that is 0.079 higher than non-issuers, which corresponds to 9.6% of the standard deviation.[11] Results are of similar magnitude when we use alternate proxies for the information environment or when we measure crash risk using *DUVOL* (Models (4)-(6)).

Our results are consistent with the view that earnings management around an SEO are associated with higher crash risk. This result is stronger for firms with a poor information environment that makes it easier for managers to hide bad news by manipulating earnings. Overall, the results so far provide support for our Hypotheses 1a and 1b.

c. Positive Earnings Surprises

If managers manipulate earnings upward around SEOs, the likelihood of observing positive earnings surprises prior to the SEO should be higher for such firms. If the upward manipulation of earnings by management is a mechanism driving the observed increase in crash

[11] For the subsample in Model (1) of Panel C of Table 4, the standard deviation of NSKEW is 0.826. The sum of the coefficients on *SEO* and *SEO* x *Poor Environment* is 0.079 (0.053 + 0.026), and is statistically significant at the 1% level (*p*-value of the *F*-test for the significance of the sum is 0.000).

risk post-issue, we expect the effect to be stronger for firms with high earnings management that have positive earnings surprises around the SEO. We explore this as an alternate way to examine Hypothesis 1b using data from I/B/E/S to compute earnings surprises for all firms in our sample. We follow the literature (e.g. Brown (2001)) and define earnings surprise as the actual quarterly earnings reported minus the analyst forecast closest, but prior, to the actual earnings announcement date. We then compute the median earnings surprise by year for each firm (*SUR*). Using this measure of earnings surprise, we then create an indicator variable (*SUR>0*) that is equal to one for firms with high earnings management (*High EM*=1) and positive median earnings surprise in the prior year and zero otherwise. We then run Equation 4 regressions using interactions with this indicator variable and present the results in Table 5.

Results in Models (1) and (2) of Table 5 show that the higher crash risk post-issue is concentrated in firms that manage earnings upwards around the SEO. The interaction term ((*SUR>0* x *SEO*) is positive and statistically significant. From Model (1), we observe no difference in crash risk between non-issuers and equity issuers with low earnings management and non-positive earnings surprises. In contrast, relative to non-issuers, crash risk for equity issuers that aggressively manage earnings upwards (i.e. those with above median earnings management and positive earnings surprises prior to the SEO) is 0.063 higher, which represents 7.6% of the standard deviation.[12] We obtain similar results using the alternate measure of crash risk- *DUVOL* (Model (2)).

d. Managerial Private Information

Per Ross (1977), managers with private information about a decline in future earnings are more likely to issue equity. This would contribute to the higher crash risk observed for equity issuers post-issue. If such behavior is driving our results, we expect that this effect will be stronger for firms where managers have greater private information. We examine this hypothesis using a proxy for managerial private information. Specifically, we follow Chen, Goldstein, and Jiang (2007) and use an alternate measure of earnings surprise based on the absolute value of abnormal stock returns around earnings announcement dates. We first estimate cumulative abnormal returns for the three days around each of the quarterly earnings announcement dates using a market model estimated from days *t-250* to *t-20*. We then compute the average of the

[12] The standard deviation of *NSKEW* for the subsample in Model (1) of Table 5 is 0.828.

absolute value of abnormal returns for each firm-year (*ESUR*) and use this as our proxy for managerial private information. Specifically we use this measure to construct an indicator variable (*Private Info.*) that is equal to one for firms with high earnings management (*High EM* =1) and above median absolute earnings surprise (*ESUR*) and zero otherwise; we run Equation 4 regressions using interactions with this proxy. Unlike our measure of earnings surprise capturing positive earnings surprises prior to the SEO (*SUR>0*), this measure captures the information content in earnings announcements, which is a proxy for managerial private information.

The results in Models (3) and (4) of Table 5 show that crash risk post-issue is higher for firms in which managers manipulate earnings and possess greater private information. The interaction term (*Private Info.* x *SEO*) is positive and significant. Taking the coefficients in Model (3), crash risk is 0.112 (0.082+0.030) higher for firms where managers have greater private information, which represents about 13.5% of the standard deviation (0.831 for this subsample). The results are similar when we use *DUVOL* as a measure of crash risk in Model (4).

V. The Impact of Securities Regulation

Our results show that firms that issue equity experience a subsequent increase in crash risk. The evidence suggests that one reason for this is that managers inflate earnings prior to the SEO through the use of discretionary accruals. Securities regulations aimed at protecting investors by mitigating market manipulation and improving transparency and disclosure should discourage or make it difficult for managers to engage in earnings manipulation around an SEO. Per Hypothesis 2, we should observe a reduction in crash risk post-SEO after the regulations come into effect. This effect should be more pronounced for firms that actively engage in earnings manipulation around SEOs.

We examine this hypothesis by focusing on a recent piece of regulation enacted across the European Union: the Market Abuse Directive (MAD). Empirical evidence (Christensen et al. 2014) supports the view that MAD has been effective, at least in countries with strong enforcement. We test Hypothesis 2 by estimating various specifications of the following regressions:

$$Crash\ Risk_{i,t} = \alpha + \beta_1 SEO_{i,t-1} + \beta_2 SEO_{i,t-1} \times Post + \beta_3 Post + \beta_4 X_{t-1} + \varepsilon_{i,t} \qquad (5)$$

where *Crash Risk* refers to our two measures- *NSKEW* and *DUVOL*- for firm *i* in year *t*; $SEO_{i,t-1}$ is an indicator variable that equals one if a firm raised equity capital in its home country in year *t-1* and zero otherwise; *Post* is an indicator variable that equals one starting the year of the enactment of MAD in country c and 0 otherwise. X_{t-1} is a vector of controls that have been shown to affect crash risk. These include: 1) $DTURN_{t-1}$ – the change in the average monthly share turnover between year *t-1* and *t-2*; 2) $SIZE_{t-1}$ – the log of the book value of total assets; 3) $SIGMA_{t-1}$ – the standard deviation of weekly firm-specific return in year *t-1*; 4) $FIRMRET_{t-1}$ – the average weekly firm-specific return in year *t-1*; 5) ROA_{t-1}- earnings before extraordinary items divided by total assets; 6) $Leverage_{t-1}$ – long-term debt divided by total assets; 7) *DISCACC* – the absolute value of discretionary accruals estimated using the modified Jones (1991) model, as in Dechow et al. (1995); 8) $Market\text{-}to\text{-}Book_{t-1}$ – the market value of equity divided by the book value of equity; and 9) lagged *NSKEW* (*DUVOL*).

Our difference-in-differences approach (Equation 5) compares differences in crash risk post-issue between equity issuers and non-issuers before and after the enactment of MAD. Our variable of interest is the interaction term, the coefficient β_2, which captures the difference in crash risk post-MAD in the year following the SEO for firms that issue equity relative to the control group of non-equity issuers. Per Hypothesis 2, we expect this coefficient to be negative and significant, suggesting a decline in post-issue crash risk for equity issuers following the enactment of the regulation.

Table 6 shows results from the estimation of Equation 5. In Models (1) and (2) we show results using the full sample of firms; in these regressions, our control group includes all firms in the country that did not issue equity. The results in Panel A of Table 6 show strong evidence of a reduction in equity issuers' crash risk post-issue subsequent to the enactment of MAD. The coefficient on the interaction term [*Post* x *SEO*] is negative and statistically significant across all model specifications. The reduction in crash risk post-issue is economically significant. Taking the coefficients in Model (1) as an example, the results show that prior to the enactment of MAD, firms that issue equity have a 0.087 higher crash risk in the subsequent year, relative to firms that did not issue equity, which represents about 9.9% of the standard deviation. In contrast, there is no significant difference in crash risk between equity issuers and non-issuers after the enactment of MAD (0.021 and statistically insignificant).[13] Results are similar when we use our alternate measure of crash risk in Model (2).

The results in Models (1) and (2) of Panel A of Table 6 may be explained by differences in characteristics between equity issuers and non-issuers. To address these concerns, we match equity issuers with a non-issuer in the same country and industry using propensity score matching, as discussed in the previous section. We report results using only the subsample of PSM-matched firms in Models (3) and (4). The results corroborate our earlier findings and document a reduction in crash risk for equity issuers relative to their PSM-matched comparable firm post-MAD. As an example, the results in Model (3) show no difference in crash risk (-0.008 and statistically insignificant) between equity issuers and non-issuers post-MAD.

If the observed decline in crash risk subsequent to an SEO can be attributed to the enactment of MAD, we should observe an impact around the enactment of this directive. To examine this hypothesis, we divide our sample period into subperiods using three indicators: 1) *Pre-Event* - an indicator that is set to one for the years *t-2* and *t-1* relative to the enactment of MAD and zero otherwise; *Event* - an indicator that is equal to one for years *t* and *t+1*, and zero otherwise, and *Post-Event* - an indicator that is set to one for years starting in *t+2* and beyond, and zero otherwise. Our base period is comprised of years prior to *t-2*. We interact these variables with our indicator variable, *SEO*. We present the results in Panel B of Table 6. If the reduction in crash risk is driven by the enactment of MAD, we expect to observe no difference in crash risk between equity issuers and non-issuers around the enactment of the reform. In Model (1) we observe that in the pre-MAD period, equity issuers have higher crash risk in the subsequent year (the coefficient on *Pre-Event* x *SEO* is positive and statistically significant). This difference in crash risk becomes insignificant during our event period. In addition, the impact of MAD on crash risk following SEOs appears to be long-lasting; there is no statistically significant difference in crash risk between equity issuers and non-issuers in the post period (the coefficient on *Post-Event* x *SEO* is actually negative, but not significant). A similar pattern is observed when we use our alternate proxy for crash risk- *DUVOL* (Model (2)). The results are thus consistent with the view that the decline in crash risk subsequent to an SEO starts around the enactment of MAD.

[13] In the post-MAD period, *NSKEW* for equity issuers is only 0.021 [-0.066+0.087] higher than for non-issuers, and this difference is not statistically significant (*p*-value of 0.267).

The results thus far suggest that the enactment of MAD is associated with a reduction in crash risk post-SEO in support of our Hypothesis 2. These findings are in line with the view that the ability of managers to hide bad news around SEOs is curtailed by the enactment of this directive. One alternative explanation for our results is that concurrent events in the country, and in particular, the mandatory adoption of International Financial Reporting Standards (IFRS), may be driving our findings. For many of our countries, the year of the enactment of MAD is the same as that of the mandatory adoption of IFRS - 2005. To disentangle the effects of MAD from those of IFRS adoption and to more precisely pin down the impact of MAD when it came into force, we run our regressions using quarterly data to take advantage of differences in the dates in which MAD came into force across our countries. While IFRS adoption became effective as of December, 2005, MAD came into force at different points in time throughout the year (see Table 1).

Using quarterly data, we identify the first quarter in which the MAD directive came into force; our variable *Post* is set to one starting the quarter in which MAD came into force in the country and zero otherwise. In these quarterly regressions, we identify equity issuers as those issuing equity in the prior quarter, and we measure crash risk using data for the four quarters subsequent to the SEO. Another advantage of this quarterly analysis is that it allows us to capture changes in crash risk that occur closer to the issuance of an SEO. For example, in the annual regressions, crash risk for a firm that issues equity in January of year t is measured using data from year $t+1$. In this case, if the increase in crash risk subsequent to the SEO occurs within the first 11 months, our annual measure would not capture it. In quarterly regressions, we are able to capture changes in crash risk starting in the quarter subsequent to the SEO.

We present results from estimations of Equation 5 using quarterly data in Panel C of Table 6. The results corroborate our earlier findings and document significant reductions in crash risk subsequent to an SEO after the enactment of MAD. Results in Model (1) show that equity issuers have higher crash risk (*NSKEW*) prior to the enactment of MAD, but this is significantly reduced subsequent to its implementation; the difference in crash risk between equity issuers and non-issuers is no longer significant after the enactment of MAD. The results are similar when we use our alternate measure of crash risk, *DUVOL* (Model (2)).

a. The Impact of MAD Conditional on Earnings Management

The reduction in crash risk post-issue observed after the enactment of MAD should be more pronounced for firms that engage in earnings manipulation to inflate earnings around the SEO. The implementation of this directive should discourage or mitigate such behavior by improving transparency and making it more difficult for managers to hide bad news from the market. We test this hypothesis by estimating Equation 5 separately for firms with high (low) earnings management around the SEO using our proxy for high earnings management, *High EM*.

We report results from these regressions in Panel A of Table 7, using our proxy for high earnings management based on total discretionary accruals (*High EM Total*). Results (untabulated) are similar when using the indicator based on discretionary current accruals. The results show significant reductions in post-issue crash risk following the enactment of MAD for equity issuers with high earnings management around the SEO. From the coefficients in Model (1), we observe that crash risk is 0.117 higher before the enactment of MAD for equity issuers with high earnings management relative to non-equity issuers. After the enactment of MAD, there is no difference in crash risk between equity issuers and non-issuers (the sum of the coefficients on *Post* x *SEO* + *SEO* is -0.014 and is insignificant). In contrast, there is no change in crash risk post-MAD for firms that do not actively engage in earnings management around SEOs (Model (2)). The coefficient on the interaction term (0.014) is insignificant. Results are similar when we use our alternate measure of crash risk in Models (3) and (4). These results add support to Hypothesis 2 and suggest that one way through which the enactment of MAD affects crash risk for equity issuers is by curtailing earnings management around SEOs.

b. The Impact of MAD and Institutional Quality

The impact of regulations can vary widely across countries although it is unclear whether firms in countries with better institutional quality stand to gain the most from their enactment. On the one hand, as argued by Djankov et al. (2003), the impact of regulations could be more beneficial in countries with already established mechanisms to enforce the new regulations. Consistent with this view, Christensen et al. (2014) show that the capital market effects of MAD are stronger in countries with better ex-ante institutional quality and enforcement. On the other hand, firms in weaker countries may benefit more from regulations aimed to improve the information environment and discourage market manipulation by insiders.

Given these opposing views on the role of institutional quality on the impact of regulation, we next examine how institutional quality and enforcement affect our results. To do so, we use two proxies for institutional quality and enforcement: 1) the rule of law index from Kaufmann et al. (2009) and 2) the public enforcement index from La Porta et al. (2006). Using these variables we create indicators of high institutional quality (*High IQ)* that equal one if the rule of law (public enforcement) index is above the median and zero otherwise. We use the rule of law index as of 2004 to group countries, given that we want to have an ex-ante measure of institutional quality. Using these indicators, we estimate Equation 5 including a triple interaction term (*Post* x *SEO* x *High IQ*) that captures the impact on crash risk for equity issuers post-MAD between countries with high and low institutional quality (enforcement). We report the results from these regressions in Panel B of Table 7.

The results in Panel B of Table 7 show that the decline in crash risk for equity issuers associated with the implementation of MAD is stronger in countries with high institutional quality. The coefficient on the triple interaction term, (*Post* x *SEO* x *High IQ*) is negative and significant across all model specifications. The results in Panel B also show some evidence that equity issuers in countries with poor ex-ante institutional quality also experience a decline in crash risk after the enactment of MAD. Taking the coefficients in Model (1) as an example, for firms in countries with poor institutional quality, crash risk was 0.079 higher for equity issuers relative to non-issuers prior to the enactment of MAD; the difference in crash risk (0.03) is not significant post-MAD. The impact is stronger for firms in countries with high institutional quality, where crash risk for equity issuers is 0.127 (or 14.4% of its standard deviation) higher before MAD, but the difference is insignificant (-0.01) post-MAD.[14] The results in Model (2) show similar results using our alternate measure of crash risk. In Models (3) and (4) we present results using the measure of public enforcement. In line with our prior findings, we observe a significant decline in post-issue crash risk following the enactment of MAD, and this effect appears stronger for firms in countries with better enforcement. These findings add support to those in Christensen et al. (2014) and underscore the importance of institutional quality in the successful implementation of regulations.

[14] The *p*-value for the F-test of significance of the sum of the coefficients [*Post* x *SEO* x *High IQ* + *SEO* x *High IQ* + *Post* x *SEO* + *SEO*] is 0.707.

If the enactment of MAD affects the ability to hide bad news around SEOs, this impact should be stronger for firms that actively engage in earnings management around SEOs. From our earlier results, this reduction should be stronger for firms in countries with strong institutional quality and enforcement. To explore this hypothesis, we run regressions separately for firms with high (low) earnings management, and include interactions with our main proxy for institutional quality – rule of law.[15] We report results from these regressions in Panel C of Table 7.

The results in Panel C of Table 7 support the view that the impact of MAD is stronger in countries with strong institutional quality; more importantly, this effect is more pronounced for firms that actively engage in earnings management around the SEO. The coefficient on the triple interaction term (*Post* x *SEO* x *High IQ*) is negative and significant in all regressions using the subsample of firms with high earnings management, but insignificant in regressions for firms with low earnings management. What these results suggest is that the implementation of MAD discouraged or mitigated the use of earnings management around SEOs to inflate earnings and this effect was stronger in countries with strong institutional quality. Equity issuers that actively engaged in such practices in countries with high institutional quality had significantly higher crash risk prior to the implementation of MAD, but this difference in crash risk disappeared after the implementation of MAD. Taking the coefficients in Model (1) as an example, prior to the implementation of MAD, *High EM* equity issuers in countries with strong institutional quality had significantly higher crash risk (0.216 or 24.7% of its standard deviation) than non-issuers. Post-MAD, crash risk for *High EM* equity issuers is not statistically significant (-0.018). The effect is weaker in countries with poor institutional quality, in which *High EM* equity issuers had significantly higher crash risk (0.117 or 13.4% of its standard deviation) than non-issuers pre-MAD; the difference in crash risk for *High EM* equity issuers in countries with poor institutional quality is smaller, but still statistically significant (0.067, or 7.6% of its standard deviation) post-MAD.[16] The results are similar when alternate measures of crash risk and institutional quality are used.

[15] In unreported results, we use the public enforcement index and obtain similar results.
[16] From Model (1) in Panel C of Table 7, *NSKEW* for *High EM* equity issuers in countries with poor institutional quality post-MAD is the sum of [*SEO* + *Post* x *SEO*] = 0.117+-0.050=0.067 (*p*-value of F-test is 0.000), which represents 7.6% of its standard deviation (0.876). For *High EM* equity issuers in strong institutional quality countries, *NSKEW* post-MAD = [0.117+0.099+-0.05+-0.184] = -0.018 (*p*-value of F-test is 0.590).

These results underscore the importance of enforcement. The implementation of MAD appears to be effective in curtailing managers' ability to inflate earnings prior to the issuance of equity particularly in countries with strong ex-ante enforcement and institutional quality. Equity issuers engaging in high earnings management (*High EM*) around SEOs, which are associated with subsequent increases in crash risk prior to MAD, experience a significant reduction in crash risk post-MAD, primarily in countries with strong institutional quality. *High EM* equity issuers continue to experience higher crash risk (albeit of smaller magnitude) after the implementation of MAD in countries with poor institutional quality.

VI. Additional Robustness Tests

We perform a variety of tests to examine the robustness of our results. Specifically, we perform several robustness tests for our main results exploring the link between earnings management and crash risk post-issue (corresponding to those in Panel B of Table 4) as well as the results examining the impact of MAD (the main results in Panel A of Table 6). In Table 8 we show results from various robustness tests associated with the link between earnings management and crash risk (Panel A) and associated with the impact of MAD (Panel B).

In Model (1) of Panel A of Table 8, we report results from regressions including additional control variables; specifically, we include controls for underwriter reputation and analyst coverage. These controls are not included in our main regressions because they constrain our sample size due to data availability. Following Megginson and Weiss (1991), our proxy for underwriter reputation (*Top 10 UW*) is an indicator variable that is equal to one if the lead underwriter for the SEO ranks in the top 10 in terms of market share of underwritten public equity offerings in the previous year, and zero otherwise. We measure analyst coverage (*Analyst Coverage*) as the log of one plus the number of analysts covering a firm during the fiscal year. Adding these additional controls, while reducing our sample size, does not alter our results. In Model (2) of Panel A of Table 8, we report results after excluding firms from the UK, which make up about 30% of our sample (see Table 1). Our results are robust to the exclusion of UK firms. In Model (3), we show results after excluding the six countries for which we could not identify any equity issuers meeting our criteria during our sample period: Cyprus, Estonia, Latvia, Malta, Slovak Republic, and Slovenia. We include firms from these countries in our main regressions because they serve as controls, given that these countries also adopted MAD.

Excluding firms from these countries does not affect our results: equity issuers with high earnings management still exhibit higher crash risk post-issue.

One alternative explanation for our results is that they are driven by other events around the SEO. In Model (4) of Panel A of Table 8, we explore this alternative explanation by examining whether our results are robust to the exclusion of firms engaged in a merger and acquisition (M&A) around the time of the SEO. Specifically, we run our regressions excluding equity issuers involved in an M&A in the same year as (or the year after) the SEO to examine whether our results are driven by this alternate event. To this end, we collect information on all M&As during our sample period from the SDC New Issues database to identify firms in our sample that were acquirers or targets in an M&A in a given year. After excluding equity issuers involved in M&As, our results continue to hold and show a significant increase in crash risk post-issue. In Model (5) of Panel A of Table 8, we report results using the total proceeds raised in the offering (scaled by total assets) instead of the indicator variable, *SEO*. All of our results continue to hold and corroborate our earlier findings.

Another plausible explanation for our results is that firms that issue seasoned equity experience a change in the distribution of returns. If so, such firms are just as likely to experience a significant increase in the probability of observing a stock price jump in the following year. To examine this alternative, we construct a measure of the likelihood of a stock price jump. Specifically, we construct an indicator variable, *JUMP*, that is equal to one if a firm experiences one or more firm-specific returns that fall in the top 0.1% of the distribution of weekly firm-specific returns in its country in a given fiscal year and zero otherwise. We use this measure as a dependent variable in probit regressions in Model (6) of Panel A of Table 8. As the results show, firms that issue equity are not more likely to experience a jump in the subsequent year than non-issuers.

In Panel B of Table 8 we present results from robustness tests of the impact of MAD on the relation between crash risk and earnings management around SEOs. As in Panel A, we show results using additional control variables (Model 1); excluding the UK (Model 2); excluding countries in which we could not identify equity issuers during our sample period (Model 3); excluding firms engaged in M&A deals (Model 4). Finally, in Model (5), we show results using interactions with total proceeds, instead of the indicator variable, *SEO*. All results corroborate our earlier findings. The results show that the enactment of MAD is associated with a significant decline in crash risk post-issue for firms that actively engage in earnings manipulation. This suggests that the enactment of MAD discourages or mitigates managers' ability to hide bad news or to inflate earnings around SEOs.

VII. Conclusion

We examine the link between equity issuances (SEOs) and subsequent crash risk for a sample of firms in 29 EU countries that adopt the Market Abuse Directive (MAD). We test the predictions of the model by Ross (1977) that suggests that managers have an incentive to issue equity when they have private information about a subsequent decline in earnings. Managers have strong incentives to hide such bad news prior to an SEO, which could increase the likelihood of stock price crashes, when the bad news about earnings are made public (Jin and Myers; 2006; Hutton, et al., 2009). We conjecture that firms that engage in aggressive manipulation strategies to inflate earnings around an SEO should experience an increase in the probability of stock price crashes. Further, we posit that the increase in crash risk post-SEO should be stronger for firms with poor information environments where managers may find it easier to engage in such behavior.

In addition to exploring the link between earnings management around SEOs and crash risk in an international setting, we further examine how the enactment of securities regulation aimed to improve disclosure and mitigate market manipulation (MAD) affects firms' ability to manage earnings around SEOs and in turn, firms' crash risk post-SEO.

We test our hypotheses by employing a difference-in-differences methodology using a sample of 6,735 firms from 29 EU countries that enact the MAD Directive. We find a significant increase in crash risk following SEOs for our sample of equity issuers relative to various control groups of non-issuers, adding support to the findings in Boehme et al. (2014). More importantly, we are the first to provide evidence that earnings manipulation around SEOs is a key mechanism driving the observed increase in crash risk post-SEO, which adds support to the predictions of Ross (1977). The increase in crash risk is stronger for firms with a poor information environment. Corroborating our main results, we document that crash risk is higher for equity issuers with positive earnings surprises prior to the SEO, which suggests increased crash risk in firms that inflate earnings around the SEO. In addition, we find stronger effects on crash risk post-issue for equity issuers where managers have greater private information.

Finally, we document a significant decline in crash risk post-issue after the enactment of MAD in the EU. Our evidence suggests that this regulation helps to mitigate the information asymmetry problems associated with SEOs and to curtail the use of earnings management to inflate earnings around SEOs, which is associated with an increased likelihood of stock price crashes subsequent to SEOs. Importantly, we find that the effects of MAD are stronger in countries with strong institutional quality and enforcement, which underscores the importance of enforcement when implementing securities regulation.

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Appendix A – Variable Definitions

Variable	Definition
ANALYST	The inverse of the number of sell-side analysts issuing one-year ahead forecasts. Specifically, we compute analyst as 1/(1+ number of analysts). Source: I/B/E/S.
DCA	Discretionary current accruals estimated following Teoh et al. (1998). Specifically, we first estimate the following regressions using the subsample, *j*, of all firms in the same country and same two-digit SIC code as the equity issuer: $$\frac{\mathrm{CA}_{i,t}}{\mathrm{TA}_{i,t-1}} = \alpha_j \frac{1}{TA_{i,t-1}} + \beta_{1j} \frac{\Delta\mathrm{SALES}_{i,t}}{TA_{i,t-1}} + \varepsilon_{i,t}$$ where *CA* is current accruals (the change in noncash current assets minus the change in operating current liabilities); *TA* is total assets, Δ*SALES* is the change in sales in year *t*. Nondiscretionary current accruals (*NDCA*) are obtained using estimates from the above regressions as: $$NDCA_{\ i,t} = \hat{\alpha}_j \frac{1}{TA_{i,t-1}} + \hat{\beta}_{1j} \frac{\Delta\mathrm{SALES}_{i,t}}{TA_{i,t-1}}$$ Discretionary current accruals are: $DCA_{i,t} = \frac{CA_{i,t}}{TA_{i,t-1}} - NDCA_{i,t}$
DISCACC	The absolute value of discretionary accruals estimated using the modified Jones (1991) model, as in Teoh et al. (1998). Specifically, we first estimate the following regressions using the subsample, *j*, all firms in the same country and same two-digit SIC code as the equity issuer: $$\frac{\mathrm{TOTACC}_{i,t}}{\mathrm{TA}_{i,t-1}} = \alpha_j \frac{1}{TA_{i,t-1}} + \beta_{1j} \frac{\Delta\mathrm{SALES}_{i,t}}{TA_{i,t-1}} + \beta_{2j} \frac{\mathrm{PPE}_{i,t}}{TA_{i,t-1}} + \varepsilon_{i,t}$$ where *TOTACC* is total accruals (earnings before extraordinary items less cash flows from operations); *TA* is total assets, Δ*SALES* is the change in sales in year *t*., and *PPE* is property, plant, and equipment. Nondiscretionary total accruals (*NDTAC*) are obtained using the estimates from the above regressions as: $$\mathrm{NDTAC}_{i,t} = \hat{\alpha}_j \frac{1}{TA_{i,t-1}} + \hat{\beta}_{1j} \frac{\Delta\mathrm{SALES}_{i,t}}{TA_{i,t-1}} + \hat{\beta}_{2j} \frac{\mathrm{PPE}_{i,t}}{TA_{i,t-1}}$$ Discretionary accruals are: $DISCACC_{i,t} = \frac{TOTACC_{i,t}}{TA_{i,t-1}} - NDTAC_{i,t}$
DISPERSION	Dispersion in analysts' earnings forecast. The standard deviation of current fiscal year earnings forecasts scaled by the absolute value of the actual earnings per share (EPS), following Diether et al. (2002). Source: IBES.
DTURN	The annual change in the average monthly share turnover. Monthly share turnover is the monthly trading volume divided by total shares outstanding during the month. Source: DataStream.
DUVOL	Down-to-up volatility- the standard deviation of the below-the-mean weekly firm-specific returns, *FIRMRET*, divided by the standard deviation of above-the-mean firm-specific return in a given year. Source: DataStream.

Appendix A – Variable Definitions. Continued.

Variable	Definition
FIRMRET	The natural logarithm of one plus the residual from regressions of weekly stock returns on the local and world market index. To account for nonsynchronous trading, we include the lead and lag local (world) stock market returns in each regression. Source: DataStream.
INTANGIBLES	The ratio of intangible assets-to-total assets. . Source: WorldScope.
Leverage	Long-term debt-divided by total assets. Source: WorldScope.
Market-to-Book	The market value of equity divided by the book value of equity. Source: DataStream and WorldScope.
NSKEW	The negative skewness of firm-specific weekly returns, *FIRMRET*, over the fiscal year. Source: DataStream.
ROA	Earnings before extraordinary items divided by total assets. Source: WorldScope.
$SEO\$_{t-1}$	Total proceeds raised (in US$ million) in the home market in year *t-1*, scaled by total assets as of year *t-2*. Source: SDC and WorldScope.
SEO_{t-1}	Indicator variable that equals one for firms that conducted an SEO in year *t-1* and zero otherwise.
SIGMA	The standard deviation of weekly firm-specific returns, *FIRMRET*, in a year. Source: DataStream.
SIZE	The log of the book value of total assets (WC02999). Source: DataStream and WorldScope.
Governance index	The average of all six Kaufmann, Kraay, and Mastruzzi (2009) governance indicators: political stability, voice and accountability, government effectiveness, regulatory quality, control of corruption, and rule of law. Each of the indices ranges from -2.5 to 2.5, with higher values indicating better governance.
GDP growth	Annual growth in real GDP. Source: World Development Indicators.
Log GDP per capita	Logarithm of real GDP (current US $) divided by the average population. Source: World Development Indicators.

Table 1 – Descriptive Statistics of Sample

The table reports the number of firms, total number of observations, and the date of adoption of the Market Abuse Directive (MAD) for our sample of firms from 29 EU countries. We exclude financial firms and utilities (SIC codes between 6000 and 6999 and between 4900 and 4949) and firms with missing data on market value of equity or total assets, as well as firms with assets below $10 million and those with negative sales. Our final sample consists of 6,735 firms (41,215 firm-year observations) from 29 countries from 1999-2012. A total of 1,352 firms issued equity in their home market during our sample period. Data on equity issues was obtained from SDC New Issues database.

Sample Description				
Country	# of firms	# of firms with SEOs	# of obs.	MAD Date
Austria	85	19	564	January 2005
Belgium	131	23	967	September 2005
Bulgaria	124	2	416	January 2007
Cyprus	68	0	319	September 2005
Czech Republic	39	1	134	February 2006
Denmark	168	23	1,205	April 2005
Estonia	14	0	62	March 2005
Finland	156	34	1,354	July 2005
France	898	135	6,115	July 2005
Germany	808	130	5,713	October 2004
Greece	315	17	2,447	July 2005
Hungary	40	4	248	July 2005
Iceland	14	2	64	July 2005
Ireland	67	18	414	July 2005
Italy	289	29	2,004	May 2005
Latvia	9	0	47	July 2005
Lithuania	17	1	85	April 2004
Luxembourg	31	5	208	May 2006
Malta	11	0	47	April 2005
Netherlands	149	45	1,060	October 2005
Norway	265	69	1,416	September 2005
Poland	229	21	954	October 2005
Portugal	60	9	457	April 2006
Romania	63	1	283	January 2007
Slovak Republic	21	0	94	January 2005
Slovenia	43	0	199	August 2004
Spain	128	26	901	November 2005
Sweden	488	82	2,970	July 2005
United Kingdom	2,005	656	10,468	July 2005
TOTAL	6,735	1,352	41,215	

Table 2. Descriptive Statistics

Table shows descriptive statistics for our main variables for our sample of firms from 29 EU countries. Stock price and financial data are obtained from Thomson's DataStream and WorldScope databases, respectively. We exclude financial firms and utilities (SIC codes between 6000 and 6999 and between 4900 and 4949) and firms with missing data on market value of equity or total assets, as well as firms with assets below $10 million and those with negative sales. We obtain data on proceeds raised in seasoned equity offerings, excluding IPOs, from Thomson's SDC Platinum New Issues database. Domestic issues are the fraction of shares issued in the domestic market and foreign issues are the fraction of shares issued in a foreign market. We use two measures of crash risk: 1) *NSKEW*- the negative skewness of firm-specific weekly returns over the fiscal year, and 2) *DUVOL*-down-to-up volatility- the standard deviation of the below-the-mean weekly firms-specific returns divided by the standard deviation of above-the-mean firm-specific return in a given year. *DTURN* is the annual change in the average monthly share turnover; *SIZE* is the log of the book value of total assets; *FIRMRET* is the natural logarithm of one plus the residual from regressions of weekly stock returns on the local and world market index; *SIGMA* is the standard deviation of weekly firm-specific returns in a year; *ROA* is earnings before extraordinary items divided by total assets; *Leverage* is long-term debt-divided by total assets; *DISCACC* is the absolute value of discretionary accruals estimated using the modified Jones (1991) model, as in Dechow et al. (1995), and *Market-to-Book* is the market value of equity divided by the book value of equity. The log of GDP per capita (*Log GDP per Capita*) and growth in real GDP (*GDP Growth*) are from the World Bank's World Development Indicators. *Governance Index* is the average of the six governance indicators from Kaufmann et al. (2009). Panel A shows statistics for the full sample, while Panels B and C report statistics for the sample of equity issuers and non-issuers, respectively. Each year, we classify equity issuers as those firms raising equity in year *t-1*. In Panel D, we report *p*-values for the tests of differences in means (*t*-test) and medians (Wilcoxon rank sum tests) between issuers and non-issuers. All firm-level variables are winsorized at top and bottom 1% of the distribution. All variables are defined in Appendix A.

Panel A - Descriptive Statistics – Full Sample

	N	Mean	25th pctl.	Median	75th pctl.	Std. dev.
Firm-Level Variables:						
SEO Proceeds/Assets$_{t-1}$	41,215	0.010	0.000	0.000	0.000	0.137
NSKEW	41,215	-0.239	-0.681	-0.217	0.209	0.879
DUVOL	41,215	-0.123	-0.369	-0.125	0.113	0.389
DTURN	41,215	-0.009	-0.011	0.000	0.005	0.079
SIZE	41,215	4.842	3.343	4.608	6.164	2.049
SIGMA	41,215	0.050	0.032	0.045	0.062	0.025
FIRMRET	41,215	-0.002	-0.002	-0.001	-0.001	0.002
ROA	41,215	0.014	-0.005	0.035	0.078	0.224
Leverage	41,215	0.133	0.008	0.089	0.208	0.150
DISCACC	41,215	0.218	0.056	0.096	0.171	0.847
Market-to-Book	41,215	2.177	0.798	1.439	2.563	3.850
Country-Level Variables:						
Log GDP per Capita	41,215	10.415	10.215	10.518	10.659	0.429
GDP Growth (%)	41,215	1.410	0.400	1.827	3.173	2.648
Governance Index	41,215	1.327	1.207	1.420	1.554	0.391

Table 2. Descriptive Statistics. Continued

Panel B - Descriptive Statistics – Equity Issuers						
	N	Mean	25th pctl.	Median	75th pctl.	Std. dev.
NSKEW	1,898	-0.187	-0.655	-0.192	0.278	0.860
DUVOL	1,898	-0.099	-0.346	-0.121	0.150	0.387
DTURN	1,898	0.002	-0.010	0.002	0.020	0.091
SIZE	1,898	5.708	4.051	5.583	7.265	2.118
SIGMA	1,898	0.056	0.035	0.049	0.070	0.028
FIRMRET	1,898	-0.002	-0.002	-0.001	-0.001	0.002
ROA	1,898	-0.063	-0.073	0.034	0.083	0.469
Leverage	1,898	0.149	0.008	0.106	0.241	0.159
DISCACC	1,898	0.290	0.066	0.116	0.226	0.760
Market-to-Book	1,898	3.488	1.337	2.265	4.079	5.567

Panel C - Descriptive Statistics – Non-Issuers						
	N	Mean	25th pctl.	Median	75th pctl.	Std. dev.
NSKEW	39,317	-0.241	-0.683	-0.219	0.206	0.880
DUVOL	39,317	-0.124	-0.370	-0.126	0.112	0.389
DTURN	39,317	-0.009	-0.011	-0.001	0.005	0.079
SIZE	39,317	4.800	3.315	4.566	6.105	2.036
SIGMA	39,317	0.050	0.032	0.044	0.062	0.025
FIRMRET	39,317	-0.002	-0.002	-0.001	-0.001	0.002
ROA	39,317	0.018	-0.004	0.035	0.078	0.205
Leverage	39,317	0.132	0.008	0.088	0.206	0.149
DISCACC	39,317	0.215	0.056	0.096	0.169	0.851
Market-to-Book	39,317	2.114	0.783	1.406	2.499	3.736

Panel D – Tests of Differences (Issuers and Non-Issuers)		
	Differences in Means (*p*-value)	Differences in Medians (*p*-value)
NSKEW	(0.005)	(0.006)
DUVOL	(0.004)	(0.004)
DTURN	(0.000)	(0.000)
SIZE	(0.000)	(0.000)
SIGMA	(0.000)	(0.000)
FIRMRET	(0.002)	(0.000)
ROA	(0.004)	(0.000)
Leverage	(0.005)	(0.000)
DISCACC	(0.006)	(0.000)
Market-to-Book	(0.007)	(0.000)

Table 3. Correlations Matrix

Table shows the correlation matrix for all main variables for our sample of firms from 29 EU countries. Stock price and financial data are obtained from Thomson's DataStream and WorldScope databases, respectively. We exclude financial firms and utilities (SIC codes between 6000 and 6999 and between 4900 and 4949) and firms with missing data on market value of equity or total assets, as well as firms with assets below $10 million and those with negative sales. We obtain data on proceeds raised in seasoned equity offerings, excluding IPOs, from Thomson's SDC Platinum New Issues database. SEO_{t-1} is an indicator variable that equals one if a firm raises equity in year *t-1* and zero otherwise. *NSKEW* is the negative skewness of firm-specific weekly returns over the fiscal year; *DUVOL*-down-to-up volatility- is the standard deviation of the below-the-mean weekly firms-specific returns divided by the standard deviation of above-the-mean firm-specific return in a given year. *DTURN* is the annual change in the average monthly share turnover; *SIZE* is the log of the book value of total assets; *FIRMRET* is the natural logarithm of one plus the residual from regressions of weekly stock returns on the local and world market index; *SIGMA* is the standard deviation of weekly firm-specific returns in a year; *ROA* is earnings before extraordinary items divided by total assets; *Leverage* is long-term debt divided by total assets; *DISCACC* is the three-year moving average of the absolute value of discretionary accruals estimated using the modified Jones (1991) model, as in Dechow et al. (1995), and *Market-to-Book* is the market value of equity divided by the book value of equity. All firm-level variables are winsorized at top and bottom 1% of the distribution. All variables are defined in Appendix A. * indicates significance at the 10% level.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
NSKEW	(1)	1										
DUVOL	(2)	0.9550*	1									
SEO_{t-1}	(3)	0.0137*	0.0138*	1								
DTURN	(4)	0.0033	0.0018	0.0256*	1							
SIZE	(5)	0.0847*	0.0897*	0.1129*	-0.0017	1						
SIGMA	(6)	-0.0459*	-0.0584*	0.0546*	-0.0113*	-0.4121*	1					
FIRMRET	(7)	0.0288*	0.0373*	-0.0455*	0.0036	0.3579*	-0.9433*	1				
ROA	(8)	0.0134*	0.0138*	-0.0952*	-0.0085*	0.1874*	-0.2465*	0.2394*	1			
Leverage	(9)	0.0305*	0.0321*	0.0311*	0.0120*	0.1917*	-0.0772*	0.0569*	-0.0228*	1		
DISCACC	(10)	0.0008	0.0005	0.0244*	0.0096*	-0.0175*	0.0127*	-0.0149*	-0.0644*	0.003	1	
Market-to-Book	(11)	0.0267*	0.0280*	0.0748*	-0.0212*	0.1733*	-0.0043	0.0019	0.0347*	-0.0303*	0.0001	1

Table 4. SEOs and Crash Risk

Table shows results from regressions of crash risk subsequent to SEO issues. The dependent variable is one of two measures of cash risk, *NSKEW* - the negative skewness of firm-specific weekly returns over the fiscal year, or *DUVOL*-down-to-up volatility- the standard deviation of the below-the-mean weekly firms-specific returns divided by the standard deviation of above-the-mean firm-specific return in a given year. Controls include: SEO_{t-1} - an indicator variable that equals one if a firm raises equity in year *t-1* and zero otherwise; *DTURN*, the annual change in the average monthly share turnover; *SIZE*, the log of the book value of total assets; *FIRMRET*, the natural logarithm of one plus the residual from regressions of weekly stock returns on the local and world market index; *SIGMA*, the standard deviation of weekly firm-specific returns in a year; *ROA*, earnings before extraordinary items divided by total assets; *Leverage*, long-term debt divided by total assets; *DISCACC*, the three-year moving average of the absolute value of discretionary accruals estimated using the modified Jones (1991) model, as in Dechow et al. (1995), and *Market-to-Book*, the market value of equity divided by the book value of equity. Country, industry and year fixed effects are included in all regressions. In Models (2) and (4) of Panel A, we report results from regression using only a sample of PSM-matched firms that do not issue equity. In Panel B we show results using interactions with indicator variables of earnings management: *High EM (Total)* and *High EM (Current)*. *High EM Total (Current)* is an indicator variable that equals one if a firm has total (current) discretionary accruals in the year prior to the SEO above the median in its country and zero otherwise. In Panel C we show results using interactions with indicator variables of earnings management and poor information environment. Our first proxy (*INFORMATION*) is the first principal component derived from analyst coverage, an indicator variable for cross-listed firms, the number of exchanges in which a firm is listed, an indicator for whether a firm is included in any stock market index, t proportion of foreign sales, and size. Our other proxies are based on dispersion in analyst forecasts (*DISPERSION*), and the ratio of intangible assets-to-assets (*INTANGIBLES*). Poor environment firms are those with high earnings management (*High EM =1*) and above median values of the information environment proxies. Heteroskedasticity robust *t*-statistics with standard errors clustered at the country level are shown in parentheses. All variables are defined in Appendix A. *, **, and *** indicate significance at the 10, 5, and 1% level, respectively.

Panel A – Baseline Regressions of SEOs and Crash Risk						
	Full sample		Matched	Full sample		Matched
Dependent Variable:		*NSKEW*			*DUVOL*	
	(1)	(2)	(3)	(4)	(5)	(6)
SEO $_{t-1}$	0.052***	0.044***	0.042**	0.023***	0.020***	0.019**
	(4.73)	(3.00)	(2.24)	(2.95)	(3.39)	(2.36)
DTURN $_{t-1}$	0.087	0.094	-0.022	0.035	0.034	-0.018
	(1.22)	(1.04)	(-0.19)	(0.97)	(0.76)	(-0.33)
SIZE $_{t-1}$	0.031***	0.144***	0.011	0.013***	0.068***	0.004
	(8.61)	(4.90)	(1.08)	(8.21)	(5.74)	(1.03)
SIGMA $_{t-1}$	-4.114***	-3.473***	-8.493**	-2.448***	-2.102***	-4.413***
	(-3.15)	(-3.28)	(-2.46)	(-3.75)	(-3.92)	(-3.05)
FIRMRET $_{t-1}$	-44.725***	-22.748*	-70.641*	-25.962***	-15.792**	-37.724**
	(-3.06)	(-1.91)	(-1.86)	(-3.52)	(-2.59)	(-2.29)
ROA $_{t-1}$	-0.029	0.008	-0.061***	-0.017	0.006	-0.025***
	(-0.88)	(0.31)	(-3.53)	(-1.02)	(0.54)	(-2.81)
Leverage $_{t-1}$	0.026	-0.092*	0.033	0.011	-0.055**	0.021
	(0.70)	(-1.87)	(0.56)	(0.72)	(-2.45)	(0.78)
DISCACC	0.006	0.002		0.003	0.001	
	(1.54)	(0.32)		(1.17)	(0.36)	
Market-to-Book $_{t-1}$	0.007***	0.011***	0.001	0.003***	0.005***	0.000
	(6.06)	(8.80)	(0.55)	(4.80)	(8.31)	(0.14)
NSKEW (DUVOL) $_{t-1}$	0.035***	-0.127***	0.080***	0.043***	-0.119***	0.087***
	(4.31)	(-9.50)	(6.82)	(7.30)	(-11.81)	(5.76)
Log GDP per Capita	0.413***	0.267*	0.169	0.216***	0.117*	0.092
	(3.25)	(1.95)	(1.12)	(3.71)	(1.94)	(1.19)
GDP Growth (%)	-0.022***	-0.023***	-0.018*	-0.010***	-0.012***	-0.009**
	(-4.26)	(-3.80)	(-2.00)	(-4.53)	(-4.22)	(-2.14)
Governance Index	-0.105	-0.149	-0.099	-0.076**	-0.094*	-0.040
	(-1.59)	(-1.52)	(-0.45)	(-2.30)	(-1.89)	(-0.34)
Country Fixed Effects	Yes	No	Yes	Yes	No	Yes
Industry Fixed Effects	Yes	No	Yes	Yes	No	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	No	Yes	No	No	Yes	No
Observations	41,215	41,215	6,809	41,215	41,215	6,809
Adjusted. R^2	0.037	0.127	0.046	0.054	0.129	0.062

Table 4. SEOs and Crash Risk Cont'd.

Panel B – SEOs, Crash Risk and Earnings Management				
Dependent Variable:	*NSKEW*		*DUVOL*	
	(1)	(2)	(3)	(4)
High EM (Total) x *SEO*	0.018***		0.011***	
	(3.13)		(3.54)	
High EM (Current) x *SEO*		0.069***		0.026***
		(3.40)		(2.80)
SEO_{t-1}	0.044**	0.013	0.018*	0.007
	(2.72)	(0.88)	(1.87)	(0.86)
$DTURN_{t-1}$	0.088	0.088	0.035	0.035
	(1.24)	(1.22)	(0.99)	(0.98)
$SIZE_{t-1}$	0.031***	0.031***	0.013***	0.013***
	(8.41)	(8.48)	(8.05)	(8.13)
$SIGMA_{t-1}$	-4.129***	-4.147***	-2.453***	-2.459***
	(-3.15)	(-3.18)	(-3.76)	(-3.78)
$FIRMRET_{t-1}$	-45.007***	-45.091***	-26.084***	-26.104***
	(-3.08)	(-3.09)	(-3.53)	(-3.55)
ROA_{t-1}	-0.026	-0.030	-0.016	-0.018
	(-0.81)	(-0.87)	(-0.95)	(-1.02)
$Leverage_{t-1}$	0.026	0.025	0.011	0.010
	(0.70)	(0.67)	(0.73)	(0.69)
DISCACC	0.005	0.006	0.002	0.003
	(1.29)	(1.54)	(0.93)	(1.17)
$Market\text{-}to\text{-}Book_{t-1}$	0.007***	0.007***	0.003***	0.003***
	(6.09)	(6.04)	(4.83)	(4.80)
High EM (Total)	-0.006		-0.002	
	(-0.79)		(-0.77)	
High EM (Current)		0.002		0.003
		(0.16)		(0.57)
$NSKEW\ (DUVOL)_{t-1}$	0.035***	0.035***	0.043***	0.043***
	(4.32)	(4.31)	(7.35)	(7.37)
Log GDP per Capita	0.419***	0.419***	0.219***	0.219***
	(3.28)	(3.28)	(3.76)	(3.76)
GDP Growth	-0.022***	-0.022***	-0.010***	-0.010***
	(-4.24)	(-4.23)	(-4.51)	(-4.50)
Governance Index	-0.105	-0.104	-0.076**	-0.076**
	(-1.58)	(-1.57)	(-2.30)	(-2.28)
Country Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	41,215	41,215	41,215	41,215
Adjusted R^2	0.037	0.037	0.054	0.054
[High EM x *SEO + SEO]*	0.062***	0.082***	0.029***	0.033***
p-value	0.000	0.001	0.001	0.006

Table 4. SEOs and Crash Risk Cont'd.

Panel C – SEOs, Crash Risk and Earnings Management and Firms' Information Environment						
Dependent Variable:	*NSKEW*			*DUVOL*		
Poor Environment Proxy:	*INFORMATION*	*DISPERSION*	*INTANGIBLES*	*INFORMATION*	*DISPERSION*	*INTANGIBLES*
	(1)	(2)	(3)	(4)	(5)	(6)
Poor Environment x *SEO*	0.053**	0.078***	0.066***	0.018*	0.031**	0.032**
	(2.50)	(3.15)	(3.11)	(1.84)	(2.53)	(2.43)
SEO_{t-1}	0.026	0.028*	0.030*	0.016**	0.016*	0.012
	(1.50)	(1.90)	(1.71)	(2.11)	(1.88)	(1.36)
Poor Environment	0.008	0.029***	0.048***	0.006	0.016***	0.017***
	(0.77)	(3.74)	(3.33)	(1.07)	(4.07)	(2.78)
$DTURN_{t-1}$	0.102	-0.015	0.087	0.042	-0.014	0.035
	(1.31)	(-0.23)	(1.22)	(1.04)	(-0.39)	(0.98)
$SIZE_{t-1}$	0.047***	0.048***	0.030***	0.022***	0.025***	0.013***
	(15.06)	(9.28)	(8.50)	(17.92)	(9.68)	(8.13)
$SIGMA_{t-1}$	-2.033**	0.888	-4.147***	-1.491***	-0.115	-2.460***
	(-2.32)	(0.96)	(-3.18)	(-3.48)	(-0.25)	(-3.77)
$FIRMRET_{t-1}$	-14.374	24.002	-45.151***	-11.312**	5.501	-26.117***
	(-1.54)	(1.44)	(-3.11)	(-2.31)	(0.70)	(-3.56)
ROA_{t-1}	0.079**	0.176***	-0.032	0.030*	0.077***	-0.018
	(2.48)	(5.34)	(-0.96)	(1.79)	(4.40)	(-1.08)
$Leverage_{t-1}$	-0.068	-0.050	0.016	-0.031	-0.027	0.007
	(-1.53)	(-1.16)	(0.43)	(-1.63)	(-1.41)	(0.48)
DISCACC	-0.001	-0.000	0.006	-0.002	-0.001	0.003
	(-0.15)	(-0.03)	(1.60)	(-0.79)	(-0.98)	(1.19)
$Market\text{-}to\text{-}Book_{t-1}$	0.010***	0.009**	0.007***	0.005***	0.004**	0.003***
	(4.19)	(2.67)	(5.99)	(3.55)	(2.72)	(4.77)
$NSKEW(DUVOL)_{t-1}$	0.028***	0.028**	0.035***	0.029***	0.022**	0.043***
	(6.68)	(2.15)	(4.28)	(5.44)	(2.66)	(7.30)
Log GDP per Capita	0.306***	0.260**	0.420***	0.157***	0.137**	0.219***
	(3.16)	(2.23)	(3.30)	(3.47)	(2.46)	(3.78)
GDP Growth	-0.009	-0.008	-0.022***	-0.005	-0.005	-0.010***
	(-1.29)	(-1.17)	(-4.29)	(-1.36)	(-1.36)	(-4.55)
Governance Index	-0.031	0.020	-0.103	-0.039	-0.011	-0.075**
	(-0.29)	(0.14)	(-1.54)	(-0.72)	(-0.16)	(-2.26)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,158	18,432	41,215	25,158	18,432	41,215
Adjusted R^2	0.040	0.043	0.037	0.058	0.061	0.054
[Poor Environment x *SEO + SEO]*	0.079***	0.106***	0.096***	0.034***	0.047***	0.044***
p-value	0.000	0.001	0.000	0.001	0.001	0.004

Table 5. SEOs and Crash Risk- Earnings Surprises and Managerial Private Information

Table shows results from regressions of crash risk subsequent to SEO issues. The dependent variable is one of two measures of cash risk, *NSKEW* - the negative skewness of firm-specific weekly returns over the fiscal year, or *DUVOL*-down-to-up volatility- the standard deviation of the below-the-mean weekly firms-specific returns divided by the standard deviation of above-the-mean firm-specific return in a given year. Controls include: SEO_{t-1} - an indicator variable that equals one if a firm raises equity in year *t-1* and zero otherwise; *DTURN*, the annual change in the average monthly share turnover; *SIZE*, the log of the book value of total assets; *FIRMRET*, the natural logarithm of one plus the residual from regressions of weekly stock returns on the local and world market index; *SIGMA*, the standard deviation of weekly firm-specific returns in a year; *ROA*, earnings before extraordinary items divided by total assets; *Leverage*, long-term debt divided by total assets; *DISCACC*, the three-year moving average of the absolute value of discretionary accruals estimated using the modified Jones (1991) model, as in Dechow et al. (1995), and *Market-to-Book*, the market value of equity divided by the book value of equity. Country, industry and year fixed effects are included in all regressions. To capture positive earnings surprise, in Models (1) and (2) we use an indicator variable *(SUR>0)* that is equal to one for firms with high earnings management (*High EM*=1) and positive median earnings surprise (actual earnings reported minus the analyst forecast closest but prior to the actual earnings announcement date) in the prior year and 0 otherwise. As a proxy for managerial private information in Models (3) and (4) we use *ESUR* -the absolute value of abnormal stock returns (*t-1, t+1*) around earnings announcement dates (Chen, et al., 2007). We use this measure to construct an indicator variable (*Private Info.*) that is equal to one for firms with high earnings management (*High EM* =1) and above median absolute earnings surprise (*ESUR*) and zero otherwise. Heteroskedasticity robust *t*-statistics with standard errors clustered at the country level are shown in parentheses. All variables are defined in Appendix A. *, **, and *** indicate significance at the 10, 5, and 1% level, respectively.

	Positive Earnings Surprises and Managerial Private Information			
Dependent Variable:	*NSKEW*	*DUVOL*	*NSKEW*	*DUVOL*
	(1)	(2)	(3)	(4)
SUR>0 x *SEO t-1*	0.040*	0.018**		
	(1.77)	(1.99)		
SUR > 0	0.018	0.006		
	(0.82)	(0.62)		
Private Info. x *SEO t-1*			0.082**	0.031**
			(2.50)	(2.07)
Private Info.			-0.011	-0.005
			(-0.93)	(-0.88)
SEO t-1	0.023	0.013	0.030*	0.016*
	(1.47)	(1.64)	(2.01)	(1.87)
DTURN t-1	0.069	0.028	0.094	0.027
	(1.00)	(0.75)	(1.24)	(0.75)
Size t-1	0.063***	0.029***	0.036***	0.016***
	(24.70)	(24.09)	(10.98)	(11.01)
Sigma t-1	-1.183	-1.016***	-4.587**	-2.754***
	(-1.69)	(-3.15)	(-2.70)	(-3.39)
FIRMRET t-1	-13.548	-10.377**	-52.868***	-31.142***
	(-1.60)	(-2.60)	(-2.95)	(-3.35)
ROA t-1	0.102***	0.045**	0.029	0.014
	(2.84)	(2.68)	(0.58)	(0.59)
Leverage t-1	-0.002	0.005	0.020	0.016
	(-0.04)	(0.27)	(0.45)	(0.81)
Abs. DISCACC t-1	0.005**	0.002	0.001	0.000
	(2.09)	(0.95)	(0.19)	(0.18)
Market-to-book t-1	0.005***	0.002**	0.006***	0.003***
	(3.58)	(2.47)	(5.70)	(5.23)
NSKEW(DUVOL) t-1	0.022***	0.022***	0.045***	0.048***
	(3.19)	(4.31)	(5.98)	(7.73)
Log GDP per capita	0.237**	0.125**	0.193	0.121*
	(2.59)	(2.72)	(1.28)	(1.72)
GDP Growth	-0.014*	-0.007*	-0.018***	-0.009***
	(-1.88)	(-1.98)	(-3.03)	(-3.40)
Governance Index	0.009	-0.025	-0.077	-0.057**
	(0.08)	(-0.45)	(-1.51)	(-2.18)
Country Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	22,988	22,988	27,803	27,803
Adjusted R^2	0.048	0.066	0.041	0.058

Table 6. SEOs and Crash Risk and the Impact of Regulations

Table shows results from regressions of crash risk subsequent to SEO issues. The dependent variable is one of two measures of cash risk, *NSKEW* - the negative skewness of firm-specific weekly returns over the fiscal year, or *DUVOL*-down-to-up volatility- the standard deviation of the below-the-mean weekly firms-specific returns divided by the standard deviation of above-the-mean firm-specific return in a given year. *Post* is an indicator variable that is equal to one starting the year after the enactment of the MAD in the country and zero otherwise. SEO_{t-1} *is* an indicator variable that equals one if a firm raises equity in year *t-1* and zero otherwise; Other controls include *DTURN*, *SIZE*, *FIRMRET*, *SIGMA*, *ROA*, *Leverage*, *DISCACC*, and *Market-to-Book*. All of these variables are defined in Appendix A. Country, industry and year fixed effects are included in all regressions. In Models (1) and (2) of Panel A we report results from our baseline regressions using all firms in our sample of countries. In Models (3) and (4) we report results using only a sample of PSM-matched firms that do not issue equity. In Panel B we report results from event time regressions using our main measure of crash risk, *NSKEW*. We interact our indicator variable, SEO_{t-1}, with three event time indicator variables: 1) *Pre-Event* - indicator variable that is set to one for the years *t-2* and *t-1* relative to the enactment of MAD and zero otherwise; 2) *Event* - indicator variable that is equal to one for years *t* and *t+1*, and zero otherwise, and 3) *Post-Event* - indicator variable that is set to one for years starting in *t+2* and beyond, and zero otherwise. In columns 2 and 3 of Panel B we run regressions separately for firms with high (low) earnings management, respectively. In Panel C we report results from regressions using quarterly data. In Panel C, *Post* is equal to one starting the quarter in which MAD was enacted and zero otherwise. Heteroskedasticity robust t-statistics with standard errors clustered at the country level are shown in parentheses. *, **, and *** indicate significance at the 10, 5, and 1% level, respectively.

Panel A – Baseline Regressions

	Full sample		*Matched*	
Dependent Variable:	*NSKEW*	*DUVOL*	*NSKEW*	*DUVOL*
	(1)	(2)	(3)	(4)
Post x *SEO t-1*	-0.066***	-0.022**	-0.070***	-0.027**
	(-3.06)	(-2.13)	(-2.82)	(-2.24)
Post	0.058	0.020	-0.006	-0.070**
	(0.98)	(0.71)	(-0.06)	(-2.23)
SEO t-1	0.087***	0.035***	0.062***	0.027***
	(6.24)	(3.47)	(3.10)	(3.18)
DTURN t-1	0.087	0.035	-0.021	-0.018
	(1.22)	(0.98)	(-0.18)	(-0.34)
Size t-1	0.031***	0.013***	0.011	0.004
	(8.59)	(8.21)	(1.04)	(0.99)
Sigma t-1	-4.125***	-2.450***	-8.528**	-4.426***
	(-3.16)	(-3.75)	(-2.45)	(-3.03)
FIRMRET t-1	-44.885***	-26.004***	-71.234*	-37.917**
	(-3.07)	(-3.52)	(-1.84)	(-2.26)
ROA t-1	-0.029	-0.017	-0.063***	-0.026***
	(-0.87)	(-1.01)	(-3.81)	(-3.01)
Leverage t-1	0.025	0.010	0.034	0.021
	(0.67)	(0.70)	(0.59)	(0.81)
DISCACC	0.006	0.003	0.000*	0.000***
	(1.53)	(1.16)	(1.98)	(4.30)
Market-to-book t-1	0.007***	0.003***	0.001	0.000
	(6.03)	(4.78)	(0.52)	(0.13)
NSKEW (DUVOL) t-1	0.035***	0.043***	0.080***	0.087***
	(4.32)	(7.28)	(6.83)	(5.72)
Log GDP per capita	0.410***	0.216***	0.154	0.077
	(3.26)	(3.72)	(1.03)	(1.03)
GDP Growth	-0.021***	-0.010***	-0.018**	-0.010**
	(-4.03)	(-4.37)	(-2.14)	(-2.67)
Governance Index	-0.112	-0.078**	-0.083	-0.020
	(-1.57)	(-2.23)	(-0.37)	(-0.17)
Country Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	41,215	41,215	6,813	6,813
Adjusted R^2	0.037	0.054	0.045	0.062
[Post x SEO + SEO]=0 p-value	0.267	0.212	0.730	0.973

Table 6. SEOs and Crash Risk and the Impact of Regulations Cont'd.

Panel B- Event Time Analysis		
Dependent Variable:	*NSKEW*	*DUVOL*
	(1)	(2)
Pre-Event x *SEO t-1*	0.136**	0.050*
	(2.29)	(1.86)
Event x *SEO t-1*	-0.051	-0.037**
	(-1.64)	(-2.57)
Post-Event x *SEO t-1*	-0.061	-0.023
	(-1.31)	(-1.12)
Pre-Event	-0.099*	-0.038
	(-1.79)	(-1.58)
Event	-0.186**	-0.085**
	(-2.09)	(-2.16)
Post-Event	-0.147*	-0.062
	(-1.79)	(-1.53)
SEO t-1	0.082**	0.040***
	(2.63)	(2.79)
DTURN t-1	0.086	0.035
	(1.21)	(0.97)
Size t-1	0.031***	0.013***
	(8.74)	(8.39)
Sigma t-1	-4.186***	-2.478***
	(-3.29)	(-3.86)
FIRMRET t-1	-46.162***	-26.574***
	(-3.35)	(-3.77)
ROA t-1	-0.029	-0.017
	(-0.88)	(-1.02)
Leverage t-1	0.024	0.010
	(0.68)	(0.70)
DISCACC	0.006	0.003
	(1.50)	(1.14)
Market-to-book t-1	0.007***	0.003***
	(6.13)	(4.85)
NSKEW (DUVOL) t-1	0.035***	0.043***
	(4.28)	(7.23)
Log GDP per capita	0.431***	0.228***
	(3.61)	(4.06)
GDP Growth	-0.023***	-0.011***
	(-4.96)	(-5.19)
Governance Index	-0.122	-0.088**
	(-1.63)	(-2.44)
Country Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	41,215	41,215
Adjusted R^2	0.037	0.054

Table 6. SEOs and Crash Risk and the Impact of Regulations Cont'd.

Panel C – Quarterly Regressions		
Dependent Variable:	*NSKEW*	*DUVOL*
	(1)	(2)
Post x *SEO t-1*	-0.063***	-0.027**
	(-2.82)	(-2.61)
Post	0.004	0.000
	(0.31)	(0.06)
SEO t-1	0.062***	0.030***
	(4.09)	(3.06)
DTURN t-1	0.119*	0.053*
	(1.93)	(1.86)
Size t-1	0.031***	0.013***
	(8.81)	(8.48)
Sigma t-1	-2.191**	-1.530***
	(-2.14)	(-3.28)
FIRMRET t-1	-24.184	-17.169**
	(-1.63)	(-2.59)
ROA t-1	0.029*	0.005
	(1.96)	(0.66)
Leverage t-1	0.008	0.003
	(0.34)	(0.30)
DISCACC	0.001	0.000
	(1.68)	(1.65)
Market-to-book t-1	-0.000	-0.000
	(-1.36)	(-1.12)
NSKEW (DUVOL) t-1	0.186***	0.194***
	(31.27)	(36.84)
Log GDP per capita	0.419***	0.214***
	(5.25)	(5.72)
GDP Growth	-0.009**	-0.005***
	(-2.58)	(-3.06)
Governance Index	-0.236***	-0.129***
	(-3.88)	(-4.33)
Country Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Quarter-year Fixed Effects	Yes	Yes
Observations	165,983	165,983
Adjusted R^2	0.061	0.078

Table 7. The Impact of MAD Conditional on Institutional Quality and Earnings Management

Table shows results from regressions of crash risk subsequent to SEO issues. The dependent variable is one of two measures of cash risk, *NSKEW* - the negative skewness of firm-specific weekly returns over the fiscal year, or DUVOL-down-to-up volatility- the standard deviation of the below-the-mean weekly firms-specific returns divided by the standard deviation of above-the-mean firm-specific return in a given year. *Post* is an indicator variable that is equal to one starting the year after the enactment of the MAD in the country and zero otherwise. Controls include: SEO_{t-1} - an indicator variable that equals one if a firm raises equity in year *t-1* and zero otherwise; *DTURN*, the annual change in the average monthly share turnover; *SIZE*, the log of the book value of total assets; *FIRMRET*, the natural logarithm of one plus the residual from regressions of weekly stock returns on the local and world market index; *SIGMA*, the standard deviation of weekly firm-specific returns in a year; *ROA*, earnings before extraordinary items divided by total assets; *Leverage*, long-term debt divided by total assets; *DISCACC*, the three-year moving average of the absolute value of discretionary accruals estimated using the modified Jones (1991) model, as in Dechow et al. (1995), and *Market-to-Book*, the market value of equity divided by the book value of equity. In Panel A we run regressions separately for firms with high (low) earnings management using the indicator, *High EM (Total)* that equals one if a firm has total discretionary accruals in the year prior to the SEO above the median in its country and zero otherwise. In Panel B, we include interactions with proxies for institutional quality (*IQ*): Rule of Law from Kaufmann et al. (2009) and Public Enforcement from La Porta, et al. (2006). Countries with High IQ are those with above median values of rule of law (public enforcement). In Panel C, we run regressions separately for *High* (*Low*) *EM* firms including interactions with our proxies for institutional quality. Heteroskedasticity robust *t*-statistics with standard errors clustered at the country level are shown in parentheses. The last row of Panel A reports the *p*-value from χ^2 tests of the difference in the interaction term (*Post* x *SEO*) between columns (a) and (b). All variables are defined in Appendix A. *, **, and *** indicate significance at the 10, 5, and 1% level, respectively.

Panel A – Impact of MAD

Dependent Variable:	*NSKEW*	*NSKEW*	*DUVOL*	*DUVOL*
	(1)	(2)	(3)	(4)
	High EM (a)	*Low EM (b)*	*High EM (a)*	*Low EM (b)*
Post x *SEO t-1*	-0.131***	0.014	-0.054***	0.018
	(-5.00)	(0.50)	(-4.91)	(1.18)
Post	0.049	0.066	0.014	0.026
	(0.79)	(0.90)	(0.48)	(0.77)
SEO t-1	0.117***	0.053**	0.050***	0.016
	(7.30)	(2.36)	(5.07)	(1.07)
DTURN t-1	0.134	0.023	0.059	0.003
	(1.66)	(0.23)	(1.58)	(0.06)
Size t-1	0.028***	0.033***	0.012***	0.014***
	(5.55)	(8.89)	(5.29)	(9.12)
Sigma t-1	-4.190***	-3.889***	-2.470***	-2.353***
	(-2.90)	(-2.91)	(-3.25)	(-3.76)
FIRMRET t-1	-45.225***	-43.502**	-26.042***	-25.582***
	(-2.82)	(-2.62)	(-3.11)	(-3.22)
ROA t-1	-0.042	0.051	-0.022	0.013
	(-1.48)	(1.00)	(-1.49)	(0.53)
Leverage t-1	0.052	-0.001	0.022	-0.001
	(0.82)	(-0.04)	(0.87)	(-0.09)
DISCACC	0.009**	-0.012**	0.004*	-0.006***
	(2.25)	(-2.75)	(1.75)	(-3.37)
Market-to-book t-1	0.004***	0.010***	0.002***	0.004***
	(3.95)	(5.12)	(3.62)	(4.04)
NSKEW (DUVOL)t-1	0.040***	0.029**	0.049***	0.037***
	(4.35)	(2.73)	(5.75)	(4.13)
Log GDP per capita	0.483***	0.356**	0.242***	0.200***
	(3.95)	(2.48)	(4.46)	(2.92)
GDP Growth	-0.022***	-0.021***	-0.010***	-0.011***
	(-3.56)	(-3.32)	(-3.46)	(-4.05)
Governance Index	-0.043	-0.175**	-0.033	-0.122***
	(-0.46)	(-2.22)	(-0.66)	(-3.32)
Country Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	20,593	20,622	20,593	20,622
Adjusted R^2	0.038	0.036	0.055	0.053
χ^2 test *p*-value[*Post* x *SEO*]a=b	0.000		0.000	

Table 7. The Impact of MAD Cont'd.

Panel B – Impact of Institutional Quality				
Dependent Variable:	*NSKEW*	*DUVOL*	*NSKEW*	*DUVOL*
Proxy for Institutional Quality (IQ)	Rule of Law		Public Enforcement	
	(1)	(2)	(3)	(4)
Post x *SEO t-1* x *High IQ*	-0.088**	-0.068***	-0.124***	-0.048***
	(-2.02)	(-3.21)	(-4.51)	(-3.72)
Post x *SEO t-1*	-0.049	-0.009	-0.059**	-0.021*
	(-1.59)	(-0.61)	(-2.52)	(-2.04)
Post x *High IQ*	-0.066*	-0.031*	0.013	0.000
	(-1.77)	(-1.77)	(0.59)	(0.02)
SEO t-1 x *High IQ*	0.048	0.045*	0.038*	0.032**
	(0.96)	(1.85)	(1.89)	(2.74)
Post MAD	0.070	0.026	0.020	-0.000
	(1.23)	(0.94)	(0.49)	(-0.00)
SEO t-1	0.079***	0.027***	0.086***	0.033***
	(7.89)	(4.84)	(5.83)	(3.55)
DTURN t-1	0.082	0.032	0.082	0.031
	(1.17)	(0.92)	(0.98)	(0.74)
Size t-1	0.031***	0.013***	0.033***	0.014***
	(8.58)	(8.22)	(9.81)	(8.91)
Sigma t-1	-4.125***	-2.449***	-4.270**	-2.713***
	(-3.14)	(-3.73)	(-2.56)	(-3.25)
FIRMRET t-1	-45.049***	-26.068***	-46.468**	-29.558**
	(-3.10)	(-3.55)	(-2.28)	(-2.76)
ROA t-1	-0.029	-0.017	-0.027	-0.016
	(-0.87)	(-1.02)	(-0.75)	(-0.86)
Leverage t-1	0.022	0.009	-0.001	0.002
	(0.59)	(0.60)	(-0.04)	(0.14)
Abs. DISCACC t-1	0.006	0.003	0.004	0.002
	(1.53)	(1.17)	(1.02)	(0.72)
Market-to-book t-1	0.007***	0.003***	0.007***	0.003***
	(5.97)	(4.74)	(5.68)	(4.46)
NSKEW(DUVOL) t-1	0.035***	0.043***	0.035***	0.044***
	(4.27)	(7.08)	(3.76)	(6.49)
Log GDP per capita	0.470***	0.245***	0.354**	0.190***
	(3.59)	(4.01)	(2.84)	(3.26)
GDP Growth	-0.021***	-0.010***	-0.020**	-0.010**
	(-4.23)	(-4.57)	(-2.60)	(-2.87)
Governance Index	-0.104	-0.075**	-0.096	-0.070
	(-1.49)	(-2.12)	(-1.14)	(-1.58)
Country Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	41,215	41,215	38,055	38,055
Adjusted R^2	0.037	0.054	0.034	0.051

Panel C – Institutional Quality and Earnings Management				
Dependent Variable:	*NSKEW*		*DUVOL*	
Proxy for Institutional Quality (*IQ*)	Rule of Law			
	(1)	(2)	(3)	(4)
	High EM (a)	*Low EM (b)*	*High EM (a)*	*Low EM (b)*
Post x *SEO t-1* x *High IQ*	-0.184**	0.022	-0.113***	-0.018
	(-2.57)	(0.23)	(-4.07)	(-0.39)
Post x *SEO t-1*	-0.050*	-0.052	-0.007	-0.012
	(-1.91)	(-0.88)	(-0.55)	(-0.48)
Post x *High IQ*	-0.094**	-0.034	-0.047**	-0.012
	(-2.29)	(-0.85)	(-2.56)	(-0.66)
SEO t-1 x *High IQ*	0.099	-0.020	0.075***	0.009
	(1.63)	(-0.27)	(2.98)	(0.23)
Post MAD	0.099	0.035	0.046	0.002
	(1.61)	(0.53)	(1.56)	(0.07)
SEO t-1	0.117***	0.046*	0.038***	0.017
	(7.89)	(2.00)	(5.63)	(1.66)
DTURN t-1	0.041	0.116	0.016	0.046
	(0.55)	(1.67)	(0.45)	(1.32)
Size t-1	0.035***	0.028***	0.015***	0.012***
	(8.55)	(6.59)	(7.75)	(6.95)
Sigma t-1	-3.867**	-4.298***	-2.298***	-2.557***
	(-2.43)	(-3.64)	(-2.89)	(-4.47)
FIRMRET t-1	-36.703**	-51.903***	-21.902**	-29.439***
	(-2.37)	(-3.13)	(-2.74)	(-3.78)
ROA t-1	-0.018	-0.035	-0.012	-0.021
	(-0.41)	(-1.12)	(-0.45)	(-1.59)
Leverage t-1	0.032	0.005	0.010	0.003
	(0.84)	(0.13)	(0.74)	(0.19)
Abs. DISCACC t-1	0.006	0.005	0.003	0.002
	(1.15)	(0.80)	(1.41)	(0.50)
Market-to-book t-1	0.008***	0.006***	0.003***	0.003***
	(5.85)	(4.38)	(4.54)	(3.86)
NSKEW(DUVOL) t-1	0.024**	0.046***	0.033***	0.051***
	(2.09)	(5.63)	(3.37)	(9.26)
Log GDP per capita	0.405***	0.523***	0.239***	0.247***
	(3.07)	(3.61)	(3.65)	(3.81)
GDP Growth	-0.022***	-0.021***	-0.011***	-0.010***
	(-4.26)	(-3.47)	(-4.67)	(-3.83)
Governance Index	-0.036	-0.154**	-0.050	-0.092***
	(-0.34)	(-2.53)	(-1.00)	(-2.92)
Country Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	20,806	20,409	20,806	20,409
Adjusted R^2	0.042	0.035	0.061	0.051

Table 8 – Additional Robustness Tests

Table shows results from regressions of crash risk subsequent to SEO issues. The dependent variable is *NSKEW* - the negative skewness of firm-specific weekly returns over the fiscal year. *Post* is an indicator variable that is equal to one starting the year after the enactment of the MAD in the country and zero otherwise. Controls are the same as those used in Tables 4 and 6 and defined in Appendix A. Additional controls include: *Top 10 UW*- an indicator variable that is equal to one if the lead underwriter for the SEO ranks in the top 10 in terms of market share of underwritten public equity offerings in the prior year, and zero otherwise, and *Analyst Coverage*- the log of one plus the number of analysts covering a firm during the fiscal year. In Model (2) we exclude all firms from the UK. In Model (3), we exclude firms from the six countries that did not have an SEO during the period (see Table 1). In Model (4) we exclude all firms involved in an M&A in the year (or year after) the SEO. In Model (5), we show results using total SEO proceeds scaled by total assets, instead of the indicator variable, *SEO*. We replicate results in Panel B, using interactions with *Post.* Heteroskedasticity robust *t*-statistics with standard errors clustered at the country level are shown in parentheses. The last row of Panel A reports the *p*-value from χ^2 tests of the difference in the interaction term (*Post* x *SEO*) between columns (a) and (b). All variables are defined in Appendix A. *, **, and *** indicate significance at the 10, 5, and 1% level, respectively.

Panel A - SEOs, Crash Risk and Earnings Management _ Robustness Tests						
Dependent Variable:	*NSKEW*					*JUMP*
	(1)	(2)	(3)	(4)	(5)	(6)
		No UK	Countries with SEOs	No M&As	Total Proceeds	
High EM x *SEO (Total Proceeds)*$_{t-1}$	0.063***	0.075**	0.076***	0.054**	0.162***	0.004
	(3.07)	(2.17)	(4.49)	(2.63)	(3.30)	(0.28)
SEO (Total Proceeds) $_{t-1}$	0.004	0.024	0.012	0.011	-0.029***	0.017
	(0.22)	(0.74)	(0.74)	(0.64)	(-5.75)	(1.05)
High EM	0.010	-0.008	0.004	0.002	-0.007	0.010**
	(0.81)	(-0.78)	(0.41)	(0.18)	(-0.98)	(2.06)
DTURN $_{t-1}$	0.091	0.114	0.085	0.104	0.089	-0.106***
	(1.29)	(1.39)	(1.17)	(1.40)	(1.25)	(-3.64)
SIZE $_{t-1}$	0.005	0.029***	0.032***	0.027***	0.031***	-0.041***
	(1.12)	(6.21)	(9.33)	(6.65)	(8.74)	(-11.56)
SIGMA $_{t-1}$	-1.748***	-2.878***	-4.138***	-4.472***	-4.066***	10.997***
	(-2.97)	(-2.81)	(-3.00)	(-3.20)	(-3.11)	(11.41)
FIRMRET $_{t-1}$	-10.478	-35.201**	-45.806***	-48.850***	-44.425***	65.463***
	(-1.19)	(-2.52)	(-2.95)	(-3.28)	(-3.04)	(6.36)
ROA $_{t-1}$	0.051	0.045	-0.029	-0.026	-0.029	-0.116**
	(1.46)	(1.35)	(-0.83)	(-0.80)	(-0.93)	(-2.28)
Leverage $_{t-1}$	-0.071*	0.037	0.009	0.035	0.028	0.061***
	(-1.77)	(0.79)	(0.26)	(0.90)	(0.77)	(3.59)
DISCACC	0.003	0.004	0.006	0.009**	0.006	0.001
	(1.43)	(0.73)	(1.60)	(2.28)	(1.64)	(0.18)
Market-to-Book $_{t-1}$	0.006***	0.008***	0.007***	0.007***	0.007***	-0.004***
	(3.23)	(4.85)	(5.92)	(5.51)	(6.14)	(-9.91)
Top 10 UW	0.078**					
	(2.25)					
Analyst Coverage t-1	0.107***					
	(14.44)					
NSKEW (JUMP) $_{t-1}$	0.017**	0.042***	0.035***	0.036***	0.035***	0.037***
	(2.78)	(5.15)	(4.06)	(4.06)	(4.33)	(4.37)
Log GDP per Capita	0.332**	0.147	0.388***	0.426***	0.417***	-0.157*
	(2.76)	(0.96)	(3.19)	(3.08)	(3.29)	(-2.01)
GDP Growth	-0.012*	-0.021***	-0.019***	-0.022***	-0.021***	0.001
	(-1.91)	(-4.75)	(-3.34)	(-4.67)	(-4.22)	(0.29)
Governance Index	0.051	-0.100	-0.117*	-0.149**	-0.107	-0.007
	(0.41)	(-1.36)	(-1.94)	(-2.21)	(-1.61)	(-0.16)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,547	30,747	40,447	35,133	41,215	41,215
Adjusted R^2	0.047	0.042	0.036	0.035	0.037	0.037

Table 8 – Additional Robustness Tests Cont'd.

Panel B – Impact of MAD – Robustness Tests					
Dependent Variable:	*NSKEW*				
	(1)	(2)	(3)	(4)	(5)
		No UK	Countries with SEOs	No M&As	Total Proceeds
Post x High EM x *SEO (Total Proceeds)* $_{t-1}$	-0.141***	-0.101*	-0.143***	-0.134**	-0.112**
	(-3.05)	(-1.86)	(-4.96)	(-2.60)	(-2.69)
Post x High EM	-0.014	0.016	0.007	0.004	0.025
	(-0.85)	(0.80)	(0.44)	(0.17)	(1.68)
Post x *SEO (Total Proceeds)*	0.016	0.004	0.010	0.018	0.041
	(0.60)	(0.06)	(0.35)	(0.45)	(0.64)
High EM x SEO	0.062	0.010	0.074**	0.100*	-0.051
	(1.52)	(0.16)	(2.29)	(1.94)	(-1.20)
High EM	-0.002	-0.019	-0.010	-0.006	-0.008
	(-0.15)	(-1.25)	(-0.72)	(-0.36)	(-0.70)
SEO (Total Proceeds) $_{t-1}$	0.033	0.088*	0.045*	0.016	0.075***
	(1.19)	(1.86)	(1.74)	(0.56)	(6.08)
Post	0.014	0.051	0.063	0.054	0.041
	(0.27)	(0.92)	(1.04)	(0.82)	(0.70)
DTURN $_{t-1}$	0.093	0.114	0.086	0.105	0.090
	(1.32)	(1.39)	(1.20)	(1.41)	(1.25)
SIZE $_{t-1}$	0.004	0.028***	0.032***	0.027***	0.031***
	(0.97)	(6.19)	(9.25)	(6.62)	(8.74)
SIGMA $_{t-1}$	-1.676**	-2.881***	-4.151***	-4.481***	-4.072***
	(-2.71)	(-2.80)	(-2.99)	(-3.19)	(-3.14)
FIRMRET $_{t-1}$	-9.518	-35.322**	-45.982***	-48.967***	-44.394***
	(-1.06)	(-2.53)	(-2.95)	(-3.28)	(-3.04)
ROA $_{t-1}$	0.052	0.041	-0.028	-0.024	-0.031
	(1.56)	(1.29)	(-0.83)	(-0.82)	(-0.94)
Leverage $_{t-1}$	-0.069*	0.036	0.010	0.036	0.027
	(-1.77)	(0.74)	(0.28)	(0.91)	(0.73)
DISCACC	0.003	0.004	0.006	0.009**	0.006
	(1.67)	(0.90)	(1.67)	(2.39)	(1.55)
Market-to-Book $_{t-1}$	0.006***	0.008***	0.007***	0.007***	0.007***
	(3.19)	(4.96)	(5.91)	(5.46)	(6.11)
Top 10 UW	0.074**				
	(2.13)				
Analyst Coverage t-1	0.107***				
	(14.53)				
NSKEW (JUMP) $_{t-1}$	0.017***	0.042***	0.035***	0.035***	0.035***
	(2.83)	(5.16)	(4.09)	(4.07)	(4.29)
Log GDP per Capita	0.329**	0.153	0.386***	0.424***	0.423***
	(2.76)	(1.01)	(3.20)	(3.11)	(3.27)
GDP Growth	-0.012*	-0.021***	-0.018***	-0.022***	-0.021***
	(-1.97)	(-4.43)	(-3.12)	(-4.43)	(-3.99)
Governance Index	0.051	-0.104	-0.127*	-0.157**	-0.118
	(0.40)	(-1.34)	(-1.92)	(-2.12)	(-1.63)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	25,547	30,747	40,447	35,133	41,215
Adjusted R^2	0.047	0.042	0.036	0.035	0.037

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